ATKINS

Member of the SNC-Lavalin Group

# Munster Term Maintenance Contract No 3

## Year 4 Natura Impact Statement

Transport Infrastructure Ireland

15/11/2021

# Notice

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## Document history

| Revision | Purpose description | Origin-ated | Checked | Reviewed | Authorised | Date |
|---|---|---|---|---|---|---|
| Rev 1 | Revision 1 | EN | EN | POD | MJ | 08/09/2021 |
| Rev 2 | Minor amendments – For Issue | EN/ NS | NS | POD | MJ | 15/11/2021 |
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## Client signoff

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| Client | Transport Infrastructure Ireland |
| Project | Munster Term Maintenance Contract No 3 |
| Job number | 5162555 |
| Client signature / date | |

# Contents

## Tables



## Figures

# 1. Introduction

The EIRSPAN Bridge Management System covers all aspects of bridge management including routine maintenance. Over the past number of years routine maintenance contracts have been undertaken by private contractors under Bridge Term Maintenance contracts. In the Munster Region the most recent contract concluded in December 2016. A Bridges Term Maintenance Contract for 653 bridges in the Munster Region is being progressed by Transport Infrastructure Ireland (TII) under a new contract.

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

As part of this contract, Atkins Ireland was commissioned by TII to provide a report to support TII in making a screening decision as to whether Appropriate Assessment of proposed routine maintenance works to bridges in Munster (i.e. Task Order 270) under the Munster Bridges Term Maintenance Contract No.3 would be required. TII undertook the Screening for Appropriate Assessment and issued determinations for each structure.

TII determined that likely significant effects could not be ruled out for 68 bridges in Munster and thus require Appropriate Assessment. This report is a Natura Impact Statement and provides supporting information to TII in making their Appropriate Assessment decision on these 68 bridges.

## 1.1. Project Background and Context

The Bridge Term Maintenance Contract for the Munster region includes 653 No. bridges, which are located on the national road network across Munster in Counties Cork , Clare, Kerry, Limerick, Tipperary and Waterford.

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

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

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

Years 1, 2 and 3 of the contract has been completed and routine maintenance works were conducted at bridges for which TII issued Screening for AA determinations where the proposed works were not likely to have significant effects on a European site. Year 4 of the contract is underway, and Screening for AA has been conducted for

each bridge to determine the likelihood of proposed works causing significant effects on a European site. Proposed 2021 works at bridges that did not 'Screen out' are the subject of this assessment.

Throughout the project, progress meetings are regularly held during the year between Atkins, TII and the Contractor. During these meetings all aspects of the project are discussed, including those relevant to ecological assessments. This is to ensure that all aspects of the project are being accounted for and consistency is being maintained throughout.

The full list of EIRSPAN bridge components and works are listed in Table 1.1 below.

**Table 1-1 EIRSPAN bridge components and works.**

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

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

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

# 2. Project Description

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

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

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

## 2.1. Proposed Works

As detailed above, the Year 4 Work Orders were screened for AA and TII issued determinations for each structure. This resulted in 68 bridges being '*Screened In*', i.e. where likely significant effects could not be ruled out, requiring those structures to undergo Appropriate Assessment. This report is a Natura Impact Statement and provides supporting information to TII in making their Appropriate Assessment decision on these 68 bridges.

These 68 bridges are located in Counties Clare (no. 3), Cork (no. 18), Kerry (no. 32), Limerick (no. 5), Tipperary (no. 5) and Waterford (no. 5). Table 2-1 summaries the main details pertaining to each of the 68 bridges; and which is illustrated in Figure 2-1 to 2-6.

The Work Orders detail the bridge identification number and name, the component of the bridge to which a work item is proposed, the work item and the quantity ($m^2$) expected to be carried out. A summary of the work categorises proposed at each bridge is detailed in Table 2-1. A description of the works is given in Section 2.1.1.

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

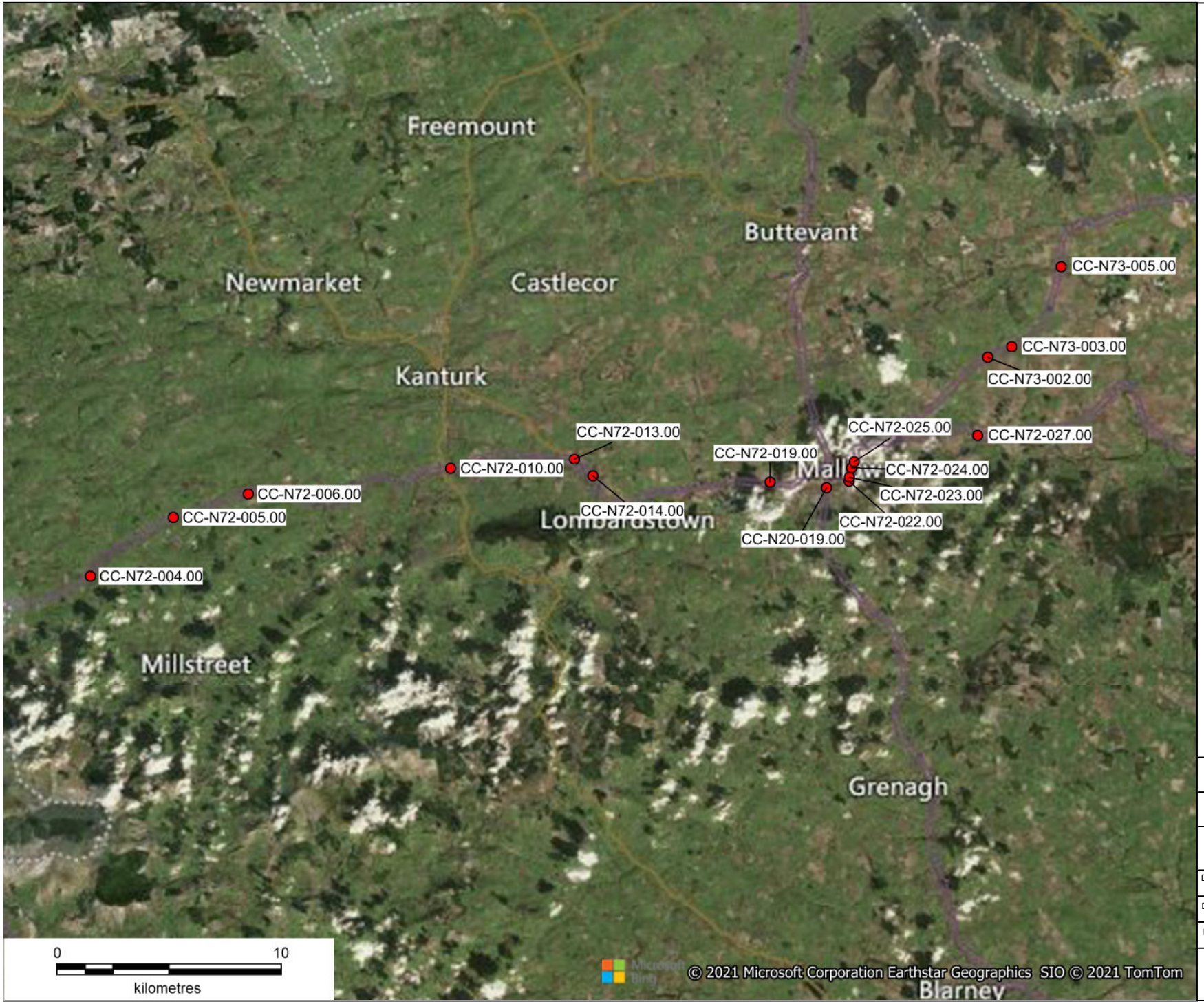
| County | Structure ID | Structure Name | Townlands | Road / River Bridge | Watercourse Name (EPA) | Water Framework Directive Sub Catchment | GPS Co-ordinates (ITM) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | X | Y |
| Cork County | CC-N20-019.00 | Blackrock Bridge | Quartertown lower | River | Blackwater [Munster] | Blackwater[Munster]_SC_090 | 555107 | 597899 |
| Cork County | CC-N71-001.00 | Tooreen Bridge | Tooreen | River | Carrigrour | Glengarriff_SC_010 | 491704 | 559480 |
| Cork County | CC-N72-004.00 | Ahane Bridge | Ahane | River | Owentaraglin 18 | Blackwater[Munster]_SC_020 | 522375 | 594400 |
| Cork County | CC-N72-005.00 | Milleenylegane Culvert | Milleenylegane | River | Knocknageeha_East | Blackwater[Munster]_SC_030 | 526106 | 596932 |
| Cork County | CC-N72-006.00 | Cloonbanin Culvert | Cloonbannin | River | Skagh | Blackwater[Munster]_SC_030 | 529443 | 597915 |
| Cork County | CC-N72-007.00 | Drominagh Bridge | Drominagh South | River | Maulyclickeen | Blackwater[Munster]_SC_030 | 530846 | 598017 |
| Cork County | CC-N72-010.00 | Leaders Bridge | Dromcummer beg | River | Allow | Dalua_SC_020 | 538438 | 598925 |
| Cork County | CC-N72-013.00 | Ketragh Bridge | Roskeen | River | Awbeg [Kanturk] | Blackwater[Munster]_SC_060 | 543932 | 599282 |
| Cork County | CC-N72-014.00 | Boland's Bridge | Roskeen | Non-EPA | Non-Listed | Blackwater[Munster]_SC_090 | 544745 | 598519 |
| Cork County | CC-N72-019.00 | Firville Culvert | Firville | River | Scarteen 18 | Blackwater[Munster]_SC_090 | 552606 | 598170 |
| Cork County | CC-N72-022.00 | Bridge Street Junction, Mallow | Mallow | River | South Caherduggan | Blackwater[Munster]_SC_090 | 556117 | 598172 |
| Cork County | CC-N72-023.00 | Spa Glen Culvert | Mallow | River | South Caherduggan | Blackwater[Munster]_SC_090 | 556128 | 598351 |
| Cork County | CC-N72-024.00 | Spa Walk South, Mallow | Mallow | River | South Caherduggan | Blackwater[Munster]_SC_090 | 556236 | 598764 |
| Cork County | CC-N72-025.00 | Spa Walk Central, Mallow | Mallow | River | South Caherduggan | Blackwater[Munster]_SC_090 | 556363 | 599042 |
| Cork County | CC-N72-027.00 | Carrig Bridge | Kilcanway | River | North Caherduggan | Blackwater[Munster]_SC_090 | 561863 | 600188 |

| County | Structure ID | Structure Name | Townlands | Road / River Bridge | Watercourse Name (EPA) | Water Framework Directive Sub Catchment | GPS Co-ordinates (ITM) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | X | Y |
| Cork County | CC-N73-002.00 | Torpys Cross Road Bridge | Annakisha south | Non-Epa Drain | Non-Epa Listed Drain | Blackwater[Munster]_SC_090 | 562347 | 603636 |
| Cork County | CC-N73-003.00 | Ballygown Pipe Culvert | Ballygown | River | Monanimy_Lower | Blackwater[Munster]_SC_090 | 563398 | 604089 |
| Cork County | CC-N73-005.00 | Ballynamona Bridge | Ballynamona | River | Awbeg [Buttevant] | Blackwater[Munster]_SC_100 | 565614 | 607606 |
| Clare | CL-N67-001.00 | Burrane Bridge | Burrane | River | Tonavoher | Cloon[Clare]_SC_010 | 506097 | 652585 |
| Clare | CL-N67-013.00 | Potter's Wheel Bridge | Cloonmore | Non-EPA Drain | Non-Listed | KiltumperStream_SC_010 | 500508 | 668915 |
| Clare | CL-N68-004.00 | Liscasey Bridge West | Liscasey | River | Liscasey | Owenslieve_SC_010 | 520929 | 666070 |
| Kerry | KY-N22-023.00 | Brewsterfield Bridge | Brewsterfield | River | Flesk [Kerry] | Flesk[Kerry]_SC_020 | 504358 | 587226 |
| Kerry | KY-N22-027.00 | Poulgorm Bridge | Clonkeen | River | Flesk [Kerry] | Flesk[Kerry]_SC_010 | 509682 | 581910 |
| Kerry | KY-N22-030.00 | Cummeenavrick Culvert #1 | Cummeenavrick | River | Ford Currimeenavrick | Flesk[Kerry]_SC_010 | 513669 | 581624 |
| Kerry | KY-N22-031.00 | Cummeenavrick Culvert #2 | Cummeenavrick | River | Ford Currimeenavrick | Flesk[Kerry]_SC_010 | 513835 | 581491 |
| Kerry | KY-N69-004.00 | Knocknacaska Culvert | Knocknacaska | River | Knocknacaska | Brick_SC_010 | 488148 | 620898 |
| Kerry | KY-N69-005.00 | Knocknacaska Arch | Knocknacaska | River | Farran 23 | Brick_SC_010 | 488566 | 621348 |
| Kerry | KY-N69-006.00 | Knockbrack Culvert | Knockbrack | River | Fahavane | Brick_SC_010 | 489062 | 621794 |
| Kerry | KY-N69-013.00 | Mountcoat Cross Pipe Culvert | Mountcoat | River | Mountcoal 23 | Feale_SC_040 | 496126 | 628373 |
| Kerry | KY-N69-018.00 | Skehanierin Culvert | Skehanierin | River | Skehanierin | Feale_SC_040 | 502063 | 634438 |
| Kerry | KY-N69-019.00 | Cloontubbrid South Culvert | Cloontubbrid South | River | Cloonmackon | Galey_SC_010 | 502921 | 636097 |

| County | Structure ID | Structure Name | Townlands | Road / River Bridge | Watercourse Name (EPA) | Water Framework Directive Sub Catchment | GPS Co-ordinates (ITM) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | X | Y |
| Kerry | KY-N69-022.00 | Cuss North Culvert | Cuss | River | Cuss | Galey_SC_020 | 504798 | 639281 |
| Kerry | KY-N69-024.00 | Tarmon East Cross Roads | Tarmon East | River | Tyshe 23 | Galey_SC_020 | 506173 | 644075 |
| Kerry | KY-N70-016.00 | Curraheen Bridge | Curraheen | River | Ballintleave | Caragh_SC_010 | 468791 | 591900 |
| Kerry | KY-N70-020.00 | Cummergorm Bridge | Coolroe lower | River | Curra | Caragh_SC_010 | 466054 | 589880 |
| Kerry | KY-N70-040.40 | Loher Bridge | Loher | River | Unnamed Watercourse | Finglasriver[Waterville]_SC_01 | 450923.5 | 561890.8 |
| Kerry | KY-N70-050.00 | Lomanagh South Bridge | Lomanagh South | River | Owreagh | Sneem_SC_010 | 467964 | 566774 |
| Kerry | KY-N70-052.60 | Derreenamacken Bridge | Derreenafoyle | River | Derreenamackan | Kealduff_SC_010 | 477745 | 567042 |
| Kerry | KY-N71-001.00 | McCarthy & O'Leary Memorial Bridge | Woodlawn | River | Flesk [Kerry] | Laune_SC_010 | 496678 | 589551 |
| Kerry | KY-N71-002.00 | Muckross Friary Bridge | Muckross | River | Cloghereen | Laune_SC_010 | 497795 | 587046 |
| Kerry | KY-N71-003.00 | Torc New Bridge | Rossnahowgarry | River | Owengarriff (Kerry) | Laune_SC_010 | 496505 | 584832 |
| Kerry | KY-N71-005.00 | Newfoundland Bay Tunnel | Gortroe | Road | | | 491878 | 582134 |
| Kerry | KY-N72-002.00 | River Gweestin Bridge | Coolroe south | River | Gweestin | Laune_SC_020 | 483791 | 595012 |
| Kerry | KY-N72-003.00 | Ballymalis Bridge | Ballymalis | River | Gortnaskarry | Laune_SC_020 | 484221 | 594498 |
| Kerry | KY-N72-012.00 | Cullavaw Bridge | Knocknacappull | River | Cullavaw (Stream) | Blackwater[Munster]_SC_010 | 513943 | 592188 |
| Kerry | KY-N86-007.00 | Annagh East Bridge | Annagh | River | Annagh 23 | Lee[Tralee]_SC_010 | 479585 | 611849 |
| Kerry | KY-N86-009.00 | Annagh Glen Bridge | Annagh | River | Undefined | Lee[Tralee]_SC_010 | 479139 | 611801 |
| Kerry | KY-N86-012.00 | Derryquay East Bridge | Curraheen | Non-EPA | Non-EPA | Lee[Tralee]_SC_010 | 476825 | 611514 |

| County | Structure ID | Structure Name | Townlands | Road / River Bridge | Watercourse Name (EPA) | Water Framework Directive Sub Catchment | GPS Co-ordinates (ITM) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | X | Y |
| Kerry | KY-N86-013.00 | Derryquay School West Culvert | Curraheen | River | Undefined | Lee[Tralee]_SC_010 | 476643 | 611488 |
| Kerry | KY-N86-014.00 | The Red Bridge | Derrymore east | Non-EPA | Non-EPA | Lee[Tralee]_SC_010 | 476490 | 611466 |
| Kerry | KY-N86-017.00 | Glasheen Bridge | Derrymore east | River | Undefined | Lee[Tralee]_SC_010 | 475296 | 611295 |
| Kerry | KY-N86-018.00 | Derrymore Bridge | Derrymore west | River | Undefined | Lee[Tralee]_SC_010 | 474415 | 611317 |
| Kerry | KY-N86-022.20 | Mountoven Culvert | Mountoven | River | Cappaclough_West | Owencashla_SC_010 | 467977.3 | 608944.6 |
| Limerick | LC-N20-003.00 | Creggane Bridge 2 | Creggane | River | Maigue | Maigue_SC_010 | 553370 | 627331 |
| Limerick | LC-N21-001.00 | Bridge Street Structure Abbeyfeale | Abbeyfeale west | River | Flows to Feale | Feale_SC_020 | 511384 | 626629 |
| Limerick | LC-N21-001.40 | Dromtrasna Culvert | Dromtrasna | River | Dromtrasna | Feale_SC_020 | 513966.9 | 626981.1 |
| Limerick | LC-N24-011.00 | Ballysimon N24 Culvert | Ballysimon | River | Groody | Shannon[Lower]_SC_090 | 561979 | 655179 |
| Limerick | LC-N69-012.00 | Massy's Bridge | Corcamore | River | Barnakyle | Ballynaclogh_SC_010 | 549340 | 653264 |
| Tipperary North | TN-N52-002.00 | Nenagh River Bridge | Nenagh north | River | Nenagh | Nenagh_SC_020 | 586700 | 681294 |
| Tipperary North | TN-N52-003.00 | Grange Bridge | Grange lower | River | Gortadalaun Stream | Nenagh_SC_020 | 587352 | 682655 |
| Tipperary North | TN-N65-001.00 | Balyeiragh Bridge | Lehinch | River | Lorrha Stream | LorrhaStream_SC_010 | 588628 | 703187 |
| Tipperary South | TS-N24-003.00 | Carrick-On-Suir Bridge 2 | Townparks | River | Glen River | Suir_SC_160 | 639661 | 621944 |
| Tipperary South | TS-N24-006.00 | Canal Bridge | Inchanabraher | River | Flows to Suir | Suir_SC_150 | 624661 | 623256 |
| Waterford | WC-N25-017.00 | Old Pike Bridge | Knocknagranagh | River | Deelish Stream | Colligan_SC_010 | 627858 | 595755 |

| County | Structure ID | Structure Name | Townlands | Road / River Bridge | Watercourse Name (EPA) | Water Framework Directive Sub Catchment | GPS Co-ordinates (ITM) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | X | Y |
| Waterford | WC-N25-025.00 | Tourig River Bridge | Rincrew | River | Tourig | Tourig_SC_010 | 608968 | 580359 |
| Waterford | WC-N72-000.60 | Ballyvecane Upper Bridge | Ballyvecane Upper | River | Owbeg (Waterford) | Blackwater[Munster]_SC_130 | 602013.2 | 596856.2 |
| Waterford | WC-N72-003.00 | Little Bridge | Cappoquin | River | Glennafallia 18 | Blackwater[Munster]_SC_140 | 610295 | 599222 |
| Waterford | WC-N72-006.00 | Finisk Bridge | Ballynahemery | River | Finisk | Finisk_SC_010 | 616179 | 596671 |

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**Legend**

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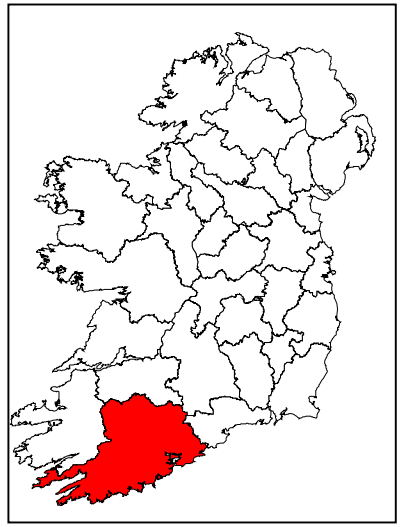

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| Project: | Munster Term Maintenance Contract No 3 |
| Title: | Locations of Cork Bridges |

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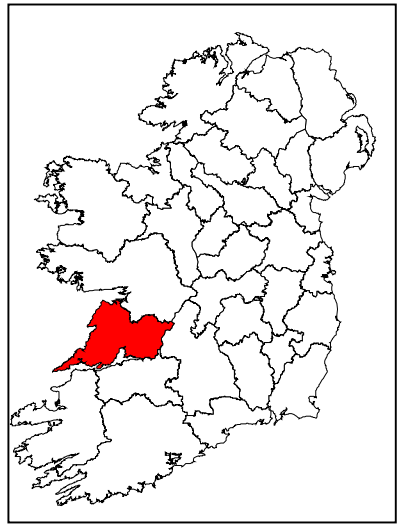

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| Project: | Munster Term Maintenance Contract No 3 |
| Title: | Locations of Clare Bridges |

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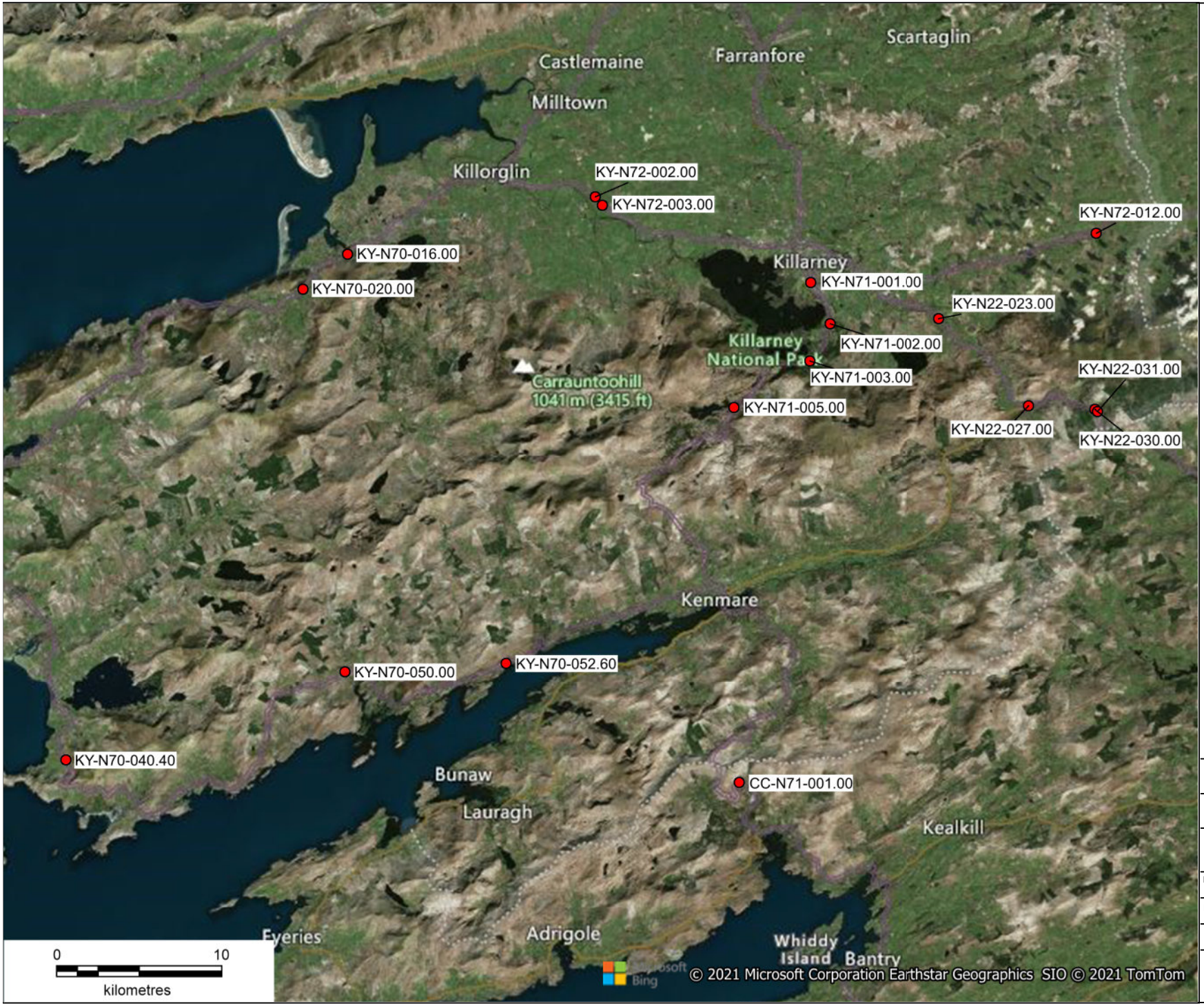


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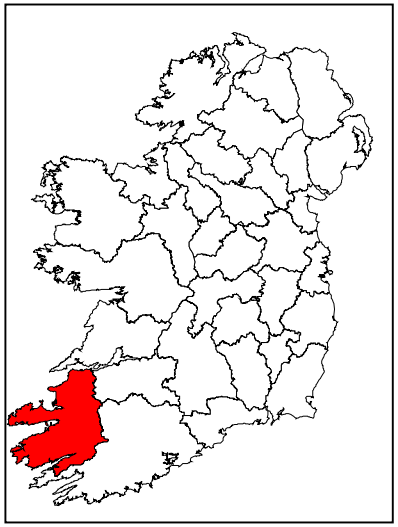
- Yr 4 NIS Bridges



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| Project: | Munster Term Maintenance Contract No 3 |
| Title: | Locations of Kerry South Bridges |

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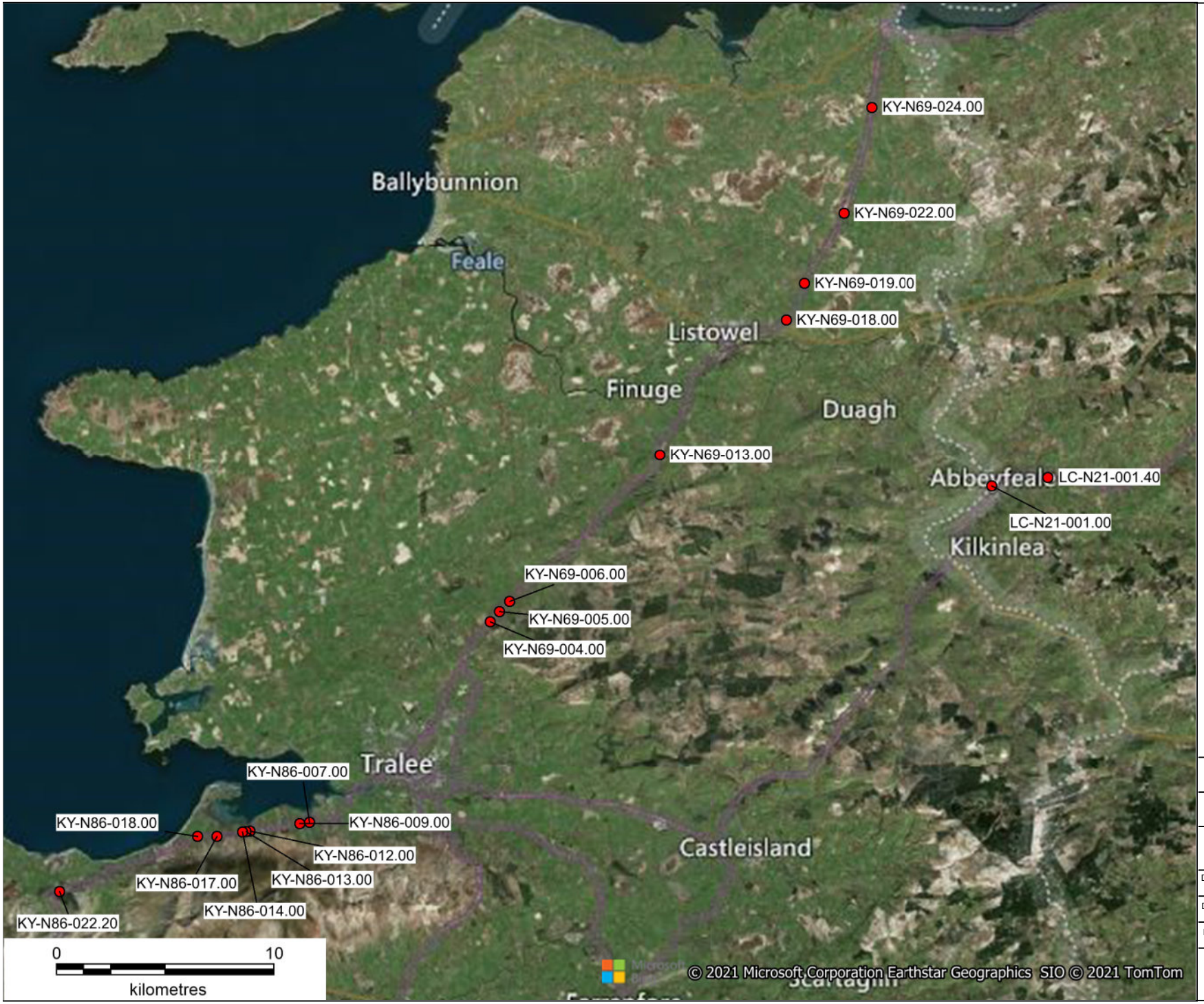


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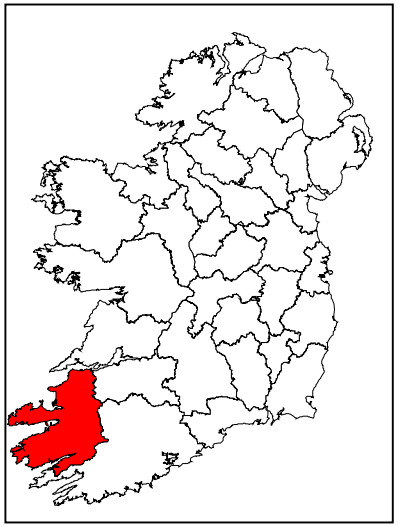

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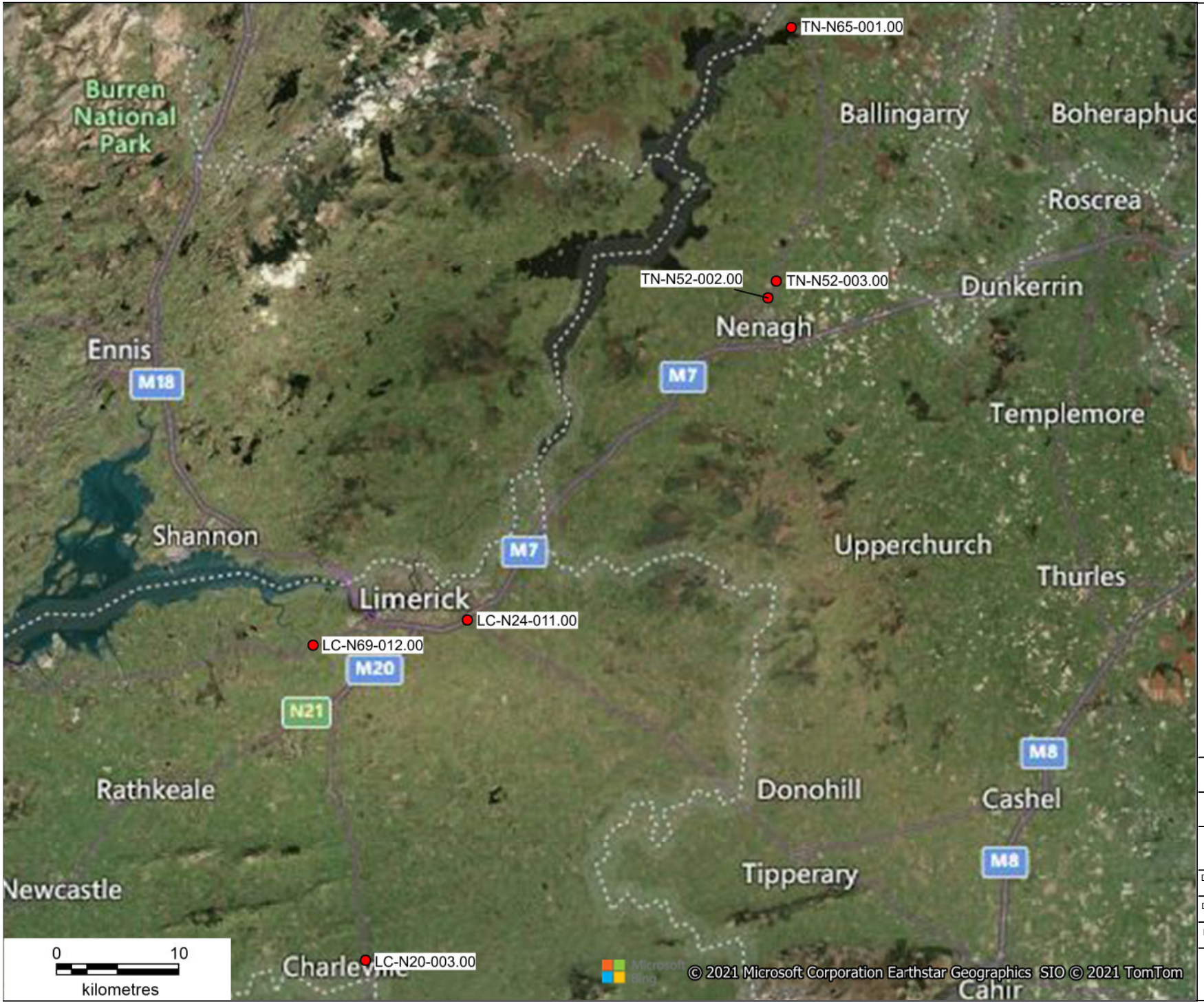
|---|---|---|
| Client: Transport Infrastructure Ireland | | |
| Project: Munster Term Maintenance Contract No 3 | | |
| Title: Locations of Kerry North and Limerick West Bridges | | |
| Drawn: EN | Checked: NS | Authorised: PO'D |
| Date: 01/09/2021 | Date: 01/09/2021 | Date: 01/09/2021 |
| Drawing No: 2.4 | | Rev: 1.0 |

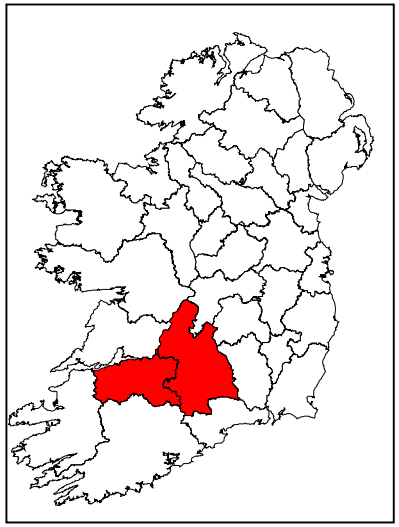
ATKINS [redacted]




N

**Legend**

- Yr 4 NIS Bridges



| | |
|---|---|
| Client: | Transport Infrastructure Ireland |
| Project: | Munster Term Maintenance Contract No 3 |
| Title: | Locations of Limerick and Tipperary North Bridges |

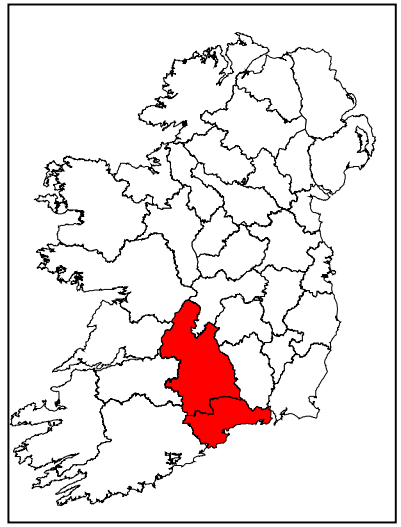
| | | |
|---|---|---|
| Drawn: EN | Checked: NS | Authorised: PO'D |
| Date: 01/09/2021 | Date: 01/09/2021 | Date: 01/09/2021 |
| Drawing No: 2.5 | | Rev: 1.0 |

ATKINS [redacted]


N

**Legend**

- Yr 4 NIS Bridges



| | | | |
|---|---|---|---|
| Client: | Transport Infrastructure Ireland | | |
| Project: | Munster Term Maintenance Contract No 3 | | |
| Title: | Locations of Tipperary South and Waterford Bridges | | |
| Drawn: EN | Checked: NS | Authorised: PO'D | |
| Date: 01/09/2021 | Date: 01/09/2021 | Date: 01/09/2021 | |
| Drawing No: 2.6 | | Rev: 1.0 | |

ATKINS [redacted]

## 2.1.1. Works Descriptions

### 2.1.1.1. Sweeping and Cleaning

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

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

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

### 2.1.1.3. Cleaning of Drains and Gullies

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

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

### 2.1.1.4. Cleaning and Maintenance of Expansion Joints

Expansion joints will be cleaned by either sweeping clean with a brush or airline/ hose. No arisings are to be allowed enter the river. Damaged joints shall be repaired using a macadam material or one compatible with the existing material. Seals that are missing of in poor condition shall be removed, cleaned and replaced. There shall be no discharge of waste on site. Note that expansion joints are not hydrologically linked to the watercourse being crossed.

### 2.1.1.5. Installation of rubbing strips

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

### 2.1.1.6. Vegetation Removal & use of herbicides

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

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

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

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

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

- Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides ('Sustainable Use of Pesticides Directive'); and,

- European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No. 155 of 2012).

- European Communities (Sustainable Use of Pesticides) (Amendment) Regulations, 2019 (S.I. No. 438 of 2019).

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

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

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

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

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

As such, herbicides will not be applied within SACs unless it is deemed by the Contractor's risk assessment to be the only viable option due to structural concerns. In such a case, a risk assessment and proposed materials must be approved by Atkins/TII.

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

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

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

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

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

However, in the case of Munster Bridges, a risk assessment of herbicide use has been conducted by the contractor in Munster. It was concluded in this assessment that herbicides will not be applied at structures and any vegetation requiring removal, will be removed manually.

#### 2.1.1.7. Clearance of watercourse

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

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

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

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

#### 2.1.1.8. Masonry repair and repointing

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

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

#### 2.1.1.9. Cleaning of graffiti

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

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

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

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

#### 2.1.1.10. Maintenance of gabions

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

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

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

#### 2.1.1.11. Reshaping (imported materials)

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

#### 2.1.1.12. Maintenance of slope protection

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

#### 2.1.1.13. Concrete Repairs

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

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

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

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

#### 2.1.1.14. Establishing base protection

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

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

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

### 2.1.2. Biosecurity protocols

Biosecurity protocols shall be implemented during the construction phase of the proposed project to prevent the introduction of invasive species listed on the 3rd Schedule of the 2011 Regulations (S.I. 477 of 2011) to site and the further spread of diseases.

The current list of watercourses where crayfish plague has been recorded can be viewed at the National Biodiversity Data Centre webpage at –

https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/.

The following biosecurity measures will be adopted: -

1. All equipment intended to be used at the site shall be dry, clean and free from debris prior to being brought to site.

2. Prior to being brought on site, equipment should be: -

    i. power steam washed at a suitably high temperature or at least 65 degrees, or

    ii. disinfected with an approved disinfectant, e.g. Virkon or an iodine-based product. It is important that the manufacturer's instructions are followed and if required, the correct

contact times are allowed for during the disinfection process. Items that are difficult to soak should be sprayed or wiped down with disinfectant

3. During the duration of the proposed project, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and disinfected prior to being brought back to the works area of the proposed project.

4. Appropriate facilities shall be used for the containment, collection and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.

5. Importation of materials shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011.

With respect to invasive species key species of concern in the Northwest include knotweeds such as Japanese knotweed (*Fallopia japonica*), as well as Himalayan balsam (*Impatiens glandulifera*), Giant hogweed (*Heracleum mantegazzianum*) and Giant rhubarb (*Gunnera* spp.). Data on invasive alien species which has been collected by TII was available for review and formed part of the GIS which informed this study. We were also able to review site photos taken by the engineers, which again showed no evidence of invasive species at the works location; as well as online sources such as NBDC; Google Earth etc.

However, as the situation on the ground can change over time (i.e. between initial site visits by the engineers to inspect the bridge; writing of the NIS and mobilisation of the Contractor), the works area at each bridge will be rechecked for invasive species prior to the commencement of works. Should any invasive species be recorded close to but not within the works, they will be fenced off using a 7m buffer from the outermost edges of invasive species such that they will not be impacted by proposed works. It is not part of the current Contract to undertake chemical control of invasive species.

If, however, an invasive species is located that impinges upon proposed works area, then the design of works may need to be revisited. In this instance the NIS would also be revisited allowing both TII, NPWS and IFI an opportunity to comment on such changes, and in the case of TII allow for the Determination to be revisited.

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

| County | Structure ID | Townlands | 01 Clearance of watercourse | 03 Removal of vegetation | 04 Scour repairs | 30 Clean drains & gullies | 45 Maintenance of slope protection | 47 Reshaping | 50 Concrete repairs | 55 Repair of parapet | 56 Establish base protection | 57 Maintenance of base protection | 60 Masonry repointing | 61 Masonry repairs | 59 Removal of graffiti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cork Co. | CC-N20-019.00 | Quartertown lower | Yes | Yes | | Yes | | | Yes | | | | | | Yes |
| Cork Co. | CC-N71-001.00 | Tooreen | | Yes | | Yes | Yes | | | | | | | | |
| Cork Co. | CC-N72-004.00 | Ahane | | Yes | | | | | Yes | | | | Yes | | |
| Cork Co. | CC-N72-005.00 | Milleenylegane | | Yes | | | | | | | | | Yes | | |
| Cork Co. | CC-N72-006.00 | Cloonbannin | | Yes | | | | | | | | | Yes | | |
| Cork Co. | CC-N72-007.00 | Drominagh South | | Yes | | | | | Yes | | | | Yes | Yes | |
| Cork Co. | CC-N72-010.00 | Dromcummer beg | Yes | Yes | | | | | | | | | | Yes | |
| Cork Co. | CC-N72-013.00 | Roskeen | Yes | Yes | | | | | | | | | Yes | Yes | |
| Cork Co. | CC-N72-014.00 | Roskeen | | Yes | | | | Yes | Yes | | | | | | |
| Cork Co. | CC-N72-019.00 | Firville | Yes | Yes | | | | | | | | | Yes | | |
| Cork Co. | CC-N72-022.00 | Mallow | Yes | Yes | | Yes | | | | | | | Yes | | |
| Cork Co. | CC-N72-023.00 | Mallow | Yes | | | Yes | | | | | | | | | |
| Cork Co. | CC-N72-024.00 | Mallow | | Yes | | Yes | | | | | | | Yes | | |
| Cork Co. | CC-N72-025.00 | Mallow | | Yes | | Yes | | | Yes | | | | Yes | | |
| Cork Co. | CC-N72-027.00 | Kilcanway | | Yes | | Yes | | | | | | | Yes | | Yes |

| County | Structure ID | Townlands | 01 Clearance of watercourse | 03 Removal of vegetation | 04 Scour repairs | 30 Clean drains & gullies | 45 Maintenance of slope protection | 47 Reshaping | 50 Concrete repairs | 55 Repair of parapet | 56 Establish base protection | 57 Maintenance of base protection | 60 Masonry repointing | 61 Masonry repairs | 59 Removal of graffiti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cork Co. | CC-N73-002.00 | Annakisha south | | Yes | | | | Yes | | | | | | Yes | |
| Cork Co. | CC-N73-003.00 | Ballygown | | Yes | | | | Yes | Yes | | | | | Yes | |
| Cork Co. | CC-N73-005.00 | Ballynamona | | Yes | | | | | | | | | | | |
| Clare | CL-N67-001.00 | Burrane | | Yes | Yes | Yes | | | | | | | Yes | Yes | |
| Clare | CL-N67-013.00 | Cloonmore | | Yes | Yes | | | | | | | | | Yes | |
| Clare | CL-N68-004.00 | Liscasey | | Yes | Yes | | | | | | | | | Yes | |
| Kerry | KY-N22-023.00 | Brewsterfield | Yes | Yes | Yes | | | | | | | | | | |
| Kerry | KY-N22-027.00 | Clonkeen | | Yes | | Yes | | | Yes | | | | | Yes | |
| Kerry | KY-N22-030.00 | Cummeenavrick | Yes | Yes | Yes | | | | | | | | | | |
| Kerry | KY-N22-031.00 | Cummeenavrick | | Yes | | | Yes | | | | | | | | |
| Kerry | KY-N69-004.00 | Knocknacaska | | Yes | Yes | | | | | | | | | Yes | |
| Kerry | KY-N69-005.00 | Knocknacaska | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N69-006.00 | Knockbrack | | Yes | Yes | | | | | | | | | | |
| Kerry | KY-N69-013.00 | Mountcoat | Yes | Yes | Yes | | | | | | | | | | |
| Kerry | KY-N69-018.00 | Skehanierin | Yes | Yes | Yes | Yes | | | | | | | | | |

| County | Structure ID | Townlands | 01 Clearance of watercourse | 03 Removal of vegetation | 04 Scour repairs | 30 Clean drains & gullies | 45 Maintenance of slope protection | 47 Reshaping | 50 Concrete repairs | 55 Repair of parapet | 56 Establish base protection | 57 Maintenance of base protection | 60 Masonry repointing | 61 Masonry repairs | 59 Removal of graffiti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N69-019.00 | Cloontubbrid South | | Yes | | Yes | | | | | | | Yes | Yes | |
| Kerry | KY-N69-022.00 | Cuss | | Yes | | | | | Yes | | | | Yes | | |
| Kerry | KY-N69-024.00 | Tarmon East | | Yes | Yes | | | | | | | | | Yes | |
| Kerry | KY-N70-016.00 | Curraheen | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N70-020.00 | Coolroe lower | Yes | Yes | | | | | Yes | | | | Yes | | |
| Kerry | KY-N70-040.40 | Loher | Yes | Yes | | Yes | | | | | Yes | | Yes | | |
| Kerry | KY-N70-050.00 | Lomanagh South | | Yes | | | | | | | | | | Yes | |
| Kerry | KY-N70-052.60 | Derreenafoyle | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N71-001.00 | Woodlawn | Yes | Yes | | Yes | | | | | | | | | Yes |
| Kerry | KY-N71-002.00 | Muckross | Yes | Yes | | Yes | | | Yes | | | | | | |
| Kerry | KY-N71-003.00 | Rossnahowgarry | | Yes | Yes | Yes | | | | | Yes | | | | |
| Kerry | KY-N71-005.00 | Gortroe | | Yes | | | | | | | | | | | |
| Kerry | KY-N72-002.00 | Coolroe south | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N72-003.00 | Ballymalis | | Yes | | | | | | | | | | Yes | |
| Kerry | KY-N72-012.00 | Knocknacappull | | Yes | | | | | | | | | Yes | | |

| County | Structure ID | Townlands | 01 Clearance of watercourse | 03 Removal of vegetation | 04 Scour repairs | 30 Clean drains & gullies | 45 Maintenance of slope protection | 47 Reshaping | 50 Concrete repairs | 55 Repair of parapet | 56 Establish base protection | 57 Maintenance of base protection | 60 Masonry repointing | 61 Masonry repairs | 59 Removal of graffiti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N86-007.00 | Annagh | | Yes | Yes | | | | | | | | | | |
| Kerry | KY-N86-009.00 | Annagh | | Yes | Yes | Yes | | | Yes | | | | | | |
| Kerry | KY-N86-012.00 | Curraheen | | Yes | | | | | Yes | | Yes | | | | |
| Kerry | KY-N86-013.00 | Curraheen | Yes | Yes | Yes | Yes | | | | | | | | | |
| Kerry | KY-N86-014.00 | Derrymore east | | Yes | | Yes | | | | | | | | Yes | |
| Kerry | KY-N86-017.00 | Derrymore east | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N86-018.00 | Derrymore west | | Yes | | | | | | | | | Yes | | |
| Kerry | KY-N86-022.20 | Mountoven | | Yes | | | | | | | | | Yes | | |
| Limerick | LC-N20-003.00 | Creggane | | Yes | | | | | Yes | | | | | Yes | |
| Limerick | LC-N21-001.00 | Abbeyfeale west | | Yes | | | | | Yes | | | | | | |
| Limerick | LC-N21-001.40 | Dromtrasna | | Yes | Yes | | | | | | | | | | |
| Limerick | LC-N24-011.00 | Ballysimon | | Yes | | Yes | | | | | | Yes | | | |
| Limerick | LC-N69-012.00 | Corcamore | | Yes | | | | | Yes | | | | Yes | | |
| Tipperary North | TN-N52-002.00 | Nenagh north | | Yes | | | | | Yes | | | | | | |
| Tipperary North | TN-N52-003.00 | Grange lower | | Yes | | | | | Yes | | | | | Yes | |
| Tipperary North | TN-N65-001.00 | Lehinch | Yes | Yes | | Yes | | | Yes | | | | | | |

| County | Structure ID | Townlands | 01 Clearance of watercourse | 03 Removal of vegetation | 04 Scour repairs | 30 Clean drains & gullies | 45 Maintenance of slope protection | 47 Reshaping | 50 Concrete repairs | 55 Repair of parapet | 56 Establish base protection | 57 Maintenance of base protection | 60 Masonry repointing | 61 Masonry repairs | 59 Removal of graffiti |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tipperary South | TS-N24-003.00 | Townparks | | Yes | | | | | Yes | | | | | Yes | |
| Tipperary South | TS-N24-006.00 | Inchanabraher | | Yes | | | | Yes | Yes | | | | | | |
| Waterford | WC-N25-017.00 | Knocknagranagh | | Yes | | | | | | | | | Yes | | |
| Waterford | WC-N25-025.00 | Rincrew | | Yes | | Yes | | | Yes | | | | | | Yes |
| Waterford | WC-N72-000.60 | Ballyvecane Upper | | Yes | | | | | | | | | Yes | | |
| Waterford | WC-N72-003.00 | Cappoquin | | Yes | | Yes | | | | | | | Yes | | |
| Waterford | WC-N72-006.00 | Ballynahemery | | Yes | Yes | | | | Yes | | | | Yes | Yes | |

## 2.2. Bridge Descriptions

### 2.2.1. Cork

#### 2.2.1.1. Blackrock Bridge [CC-N20-019.00]

Blackrock Bridge is a 5-span concrete slab bridge with an overall length of 114.3m. There are steel parapet railings along the carriageway. The bridge carries the N20 over the River Blackwater within the Blackwater River (Cork/Waterford) SAC. Plate 2.1 displays the eastern face of the structure.

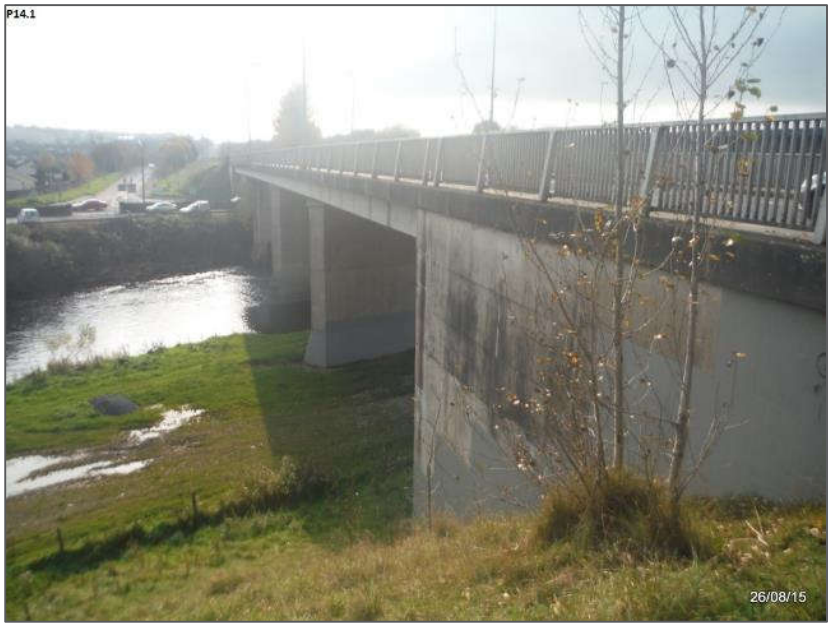



**Plate 2-1** Blackrock Bridge.

#### 2.2.1.2. Tooreen Bridge [CC-N71-001.00]

Tooreen Bridge is a single span masonry arch bridge with an overall length of 5.23m. There are masonry parapet walls along the road carriageway. The bridge carries the N71 across the Carrigrour River. Glengarriff Harbour and Woodland SAC is located 500m downstream of the bridge. Plate 2.2 displays the east elevation of the bridge.


**Plate 2-2** Tooreen Bridge.

### 2.2.1.3. Ahane Bridge [CC-N72-004.00]

Ahane Bridge is a double span masonry arch bridge with a concrete slab secondary structure with an overall length of 19.5m. There are spalled concrete parapet walls along the carriageway. The bridge carries the N72 over the Owentaraglin River within the Blackwater River (Cork/Waterford) SAC. Plate 2.3 displays the north elevation.


**Plate 2-3** Ahane Bridge.

### 2.2.1.4. Milleenylegane Culvert [CC-N72-005.00]

Milleenylegane Culvert is a single span concrete slab structure with an overall length of 2.46m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Knocknageeha East Stream. The Blackwater River (Cork/Waterford) SAC is located 7.8km downstream of bridge. Plate 2.4 displays the abutments and wing walls.

**Plate 2-4** Milleenylegane Culvert.

### 2.2.1.5. Cloonbanin Culvert [CC-N72-006.00]

Cloonbanin Culvert is a single span concrete slab structure with an overall length of 2.66m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Skagh Stream. The Blackwater River (Cork/Waterford) SAC is located 5.6km downstream of bridge. Plate 2.5 displays the north elevation.

**Plate 2-5** Cloonbanin Culvert.

### 2.2.1.6. Drominagh Bridge [CC-N72-007.00]

Drominagh Bridge is a single span masonry arch structure with an overall length of 5.54m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Maulyclickeen Stream. The Blackwater River (Cork/Waterford) SAC is located 4km downstream of bridge. Plate 2.6 displays the north elevation.

**Plate 2-6** Drominagh Bridge.

### 2.2.1.7. Leaders Bridge [CC-N72-010.00]

Leaders Bridge is a triple span masonry arch bridge with an overall length of 29m. There are masonry parapet walls along the carriageway. The bridge carries the N72 over the River Allow within the Blackwater River (Cork/Waterford) SAC. Plate 2.7 displays the north elevation


**Plate 2-7** Leaders Bridge.

### 2.2.1.8. Ketragh Bridge [CC-N72-013.00]

The Ketragh Bridge is a 3-span masonry arch bridge with concrete extension which carries N72 over the River Awbeg. Each span is 2.4m. There is masonry parapets and steel safety barrier on concrete posts. The bridge is within the Blackwater River (Cork/Waterford) SAC. Plate 2-8a shows the arch section at north side and Plate 2-8b shows the concrete slab section at south side.

**Plate 2-8a** Ketragh Bridge.

**Plate 2-8b** Ketragh Bridge.

### 2.2.1.9. Boland's Bridge [CC-N72-014.00]

The Boland's Bridge is a single span masonry arch bridge with in-situ reinforced concrete extension. The original arch barrel has a span of 1.2m. The concrete slab extension has a clear span of 1.258m and measures 2.25m to the barrel of the slab. The bridge is within the Blackwater River (Cork/Waterford) SAC. Plate 2-9 shows the concrete section at north side.

**Plate 2-9** Boland's Bridge.

### 2.2.1.10. Firville Culvert [CC-N72-019.00]

The structure is a 2-span masonry structure with masonry parapets. The maximum span is 1.17m and the minimum span is 0.67m. The structure is located 600m upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2-10 shows the north side.

**Plate 2-10** Firville Culvert.

### 2.2.1.11. Bridge Street Junction, Mallow [CC-N72-022.00]

Bridge Street Junction, Mallow is a double span masonry arch bridge with secondary concrete slab structure with an overall length of 14m. There are steel parapet railings along the carriageway. The bridge carries the N72 over the South Caherduggan River within the Blackwater River (Cork/Waterford) SAC. Plate 2.11 displays the eastern elevation.


**Plate 2-11** Bridge Street Junction, Mallow.

### 2.2.1.12. Spa Glen Culvert [CC-N72-023.00]

Spa Glen Culvert is a culvert over the South Caherduggan Stream which is accessed through a manhole in the road carriageway of Spa Square. The Blackwater River (Cork/Waterford) SAC is located 1km downstream of culvert. Plate 2.12 displays man hole access to the culvert.

**Plate 2-12** Spa Glen Culvert.

### 2.2.1.13. Spa Walk South, Mallow [CC-N72-024.00]

The structure is a 2-span masonry arch bridge with masonry parapets which carries N72 over the South Caherduggan. The maximum span is 2.55m and the minimum span is 2.45m. The rise of arch barrel at crown is 0.84m. The structure is located 1km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2-13 shows the east elevation.

**Plate 2-13** Spa Walk South, Mallow.

### 2.2.1.14. Spa Walk Central, Mallow [CC-N72-025.00]

The structure is a 3.26m single span masonry arch bridge carrying N72 over the South Caherduggan. The passage is a tributary of the River Blackwater. There is steel safety barrier on steel posts and masonry parapets. There are 2 no. manholes to the south and 3 no. manholes to the north. The structure is located 1.3km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2-14 shows the east elevation.

**Plate 2-14** Spa Walk Central, Mallow**.**

### 2.2.1.15. Carrig Bridge [CC-N72-027.00]

Carrig bridge is a single span masonry arch bridge with concrete slab secondary structure with a span of 4.71m. Masonry parapets are present along the roadsides. The bridge carries the N72 across the North Caherduggan River, within the Blackwater River (Cork/Waterford) SAC. Plate 2-15 shows the masonry and concrete slab structure of the bridge.

**Plate 2-15 Carrig Bridge.**

### 2.2.1.16. Torpys Cross Road Bridge [CC-N73-002.00]

Torpys Cross Road Bridge is a single span masonry arch bridge with a span of 2.3m. Masonry parapets are present along the roadsides. The bridge carries the N73 across an unnamed drain, upstream of the North Caherduggan River, 2.1km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2-16 shows the south elevation of the bridge.


**Plate 2-16** Torpys Cross Road Bridge.

### 2.2.1.17. Ballygown Pipe Culvert [CC-N73-003.00]

Ballygown Pipe Culvert is a 5 span concrete pipe culvert with a span width of 4.4m. Concrete parapet walls are present along the roadsides. The bridge carries the N73 across Monanimy Lower Stream, 2.4km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2-17 shows the pipes.

**Plate 2-17** Ballygown Pipe Culvert.

### 2.2.1.18. Ballynamona Bridge [CC-N73-005.00]

The Ballynamona Bridge is a 3-span masonry arch bridge with masonry parapets which carries N73 over the River Awbeg. The maximum span is 5.62m and the minimum span is 4.04m. There is pumphouse for main water supply built on southeast corner of the bridge. The structure is within Blackwater River (Cork/Waterford) SAC. Plate 2-18 shows the east elevation.

**Plate 2-18 Ballynamona Bridge.**

## 2.2.2. Clare

### 2.2.2.1. Burrane Bridge [CL-N67-001.00]

The Burrane Bridge is a 2-span bridge comprised by corrugated steel arch on the south side and masonry arch on the north side. The span is 3.1m each and rise of arch barrel at crown is 1.34m. There is steel safety barrier on the south side and steel parapet on the north side. The structure is within the Lower River Shannon SAC and River Shannon and is located 80m upstream of the River Fergus Estuaries SPA. Plate 2-19 shows the north elevation.

**Plate 2-19** Burrane Bridge.

### 2.2.2.2. Potter's Wheel Bridge [CL-N67-013.00]

Potter's Wheel Bridge is a single span concrete slab structure with a total span width of 2.85m. The bridge carries the N67 over an unnamed stream which appears to ultimately drains to Doonbeg Bay. Carrowmore Dunes SAC and Mid-Clare Coast SPA are located approximately 1km downstream of the bridge. Plate 2.20 displays the north elevation of the structure.

**Plate 2-20** Potter's Wheel Bridge.

### 2.2.2.3. Liscasey Bridge West [CL-N68-004.00]

The Liscasey Bridge is a 2-span stone masonry arch bridge. The span lengths are 1.34m and 1.62m. The substructure consists of 2 masonry abutments and a masonry pier. There are masonry parapets on both sides of the carriageway. The structure is located 10.8km upstream of Lower River Shannon SAC and located 10.8km upstream of River Shannon and Fergus Estuaries SPA. Plate 2-21 shows the south elevation.

**Plate 2-21 Liscasey Bridge West.**

## 2.2.3. Kerry

### 2.2.3.1. Brewsterfield Bridge [KY-N22-023.00]

The Brewsterfield Bridge is a 61.3m triple span concrete slab structure which carries the N22 over the River Flesk in Co. Kerry. Steel parapet railings line the carriageway. The bridge is located within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and 13.5km upstream of Killarney National Park SPA. Plate 2.22 displays the northern elevation.


**Plate 2-22** Brewsterfield Bridge.

### 2.2.3.2. Poulgorm Bridge [KY-N22-027.00]

The Poulgorm Bridge is a 23.90m single span concrete bridge which carries the N22 over the River Flesk in Co. Kerry. The parapets comprise heavy steel rails over the deck with a masonry parapet at top of the wing walls. The bridge is within the Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC. Plate 2-23 shows the south elevation.

**Plate 2-23** Poulgorm Bridge.

### 2.2.3.3. Cummeenavrick Culvert #1 [KY-N22-030.00]

The Cummeenavrick Culvert #1 is a 1.76m-wide single span concrete pipe culvert which carries the N22 over the Ford Currimeenavrick Stream. Steel safety barriers line the carriageway. The bridge is located 1.2km upstream of the Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and over 30km upstream of the Killarney National Park SPA. Plate 2.24 displays the south elevation.


**Plate 2-24** Cummeenavrick Culvert #1.

### 2.2.3.4. Cummeenavrick Culvert #2 [KY-N22-031.00]

The Cummeenavrick Culvert #2 is a single span pipe culvert with a total span width of 5.5m which carries the N22 over the Ford Currimeenavrick Stream in Co. Kerry. Timber fencing and steel safety barriers are located above the culvert and along the roadway. The Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC is located 1.4km downstream of the culvert, while the Killarney National Park SPA is over 30km downstream. Plate 2-25 shows the south elevation.


**Plate 2-25** Cummeenavrick Culvert #2.

### 2.2.3.5. Knocknacaska Culvert [KY-N69-004.00]

Knocknacaska Culvert is a double span concrete slab structure with an overall span width of 2.5m. Timber fencing lines the road above the culvert. The culvert carries the Knocknacaska Stream below the N69. The Lower River Shannon SAC is located approximately 10.6km downstream of the culvert. Plate 2.26 displays the west elevation.


**Plate 2-26** Knocknacaska Culvert.

### 2.2.3.6. Knocknacaska Arch [KY-N69-005.00]

Knocknacaska Arch is a single span masonry arch bridge with concrete slab sub-structure with an overall span width of 8.3m. Masonry walls line the road above the bridge. The bridge carries the Farran Stream below the N69. The Lower River Shannon SAC is located approximately 10.2km downstream of the bridge. Plate 2.27 displays the west elevation.


**Plate 2-27** Knocknacaska Arch.

### 2.2.3.7. Knockbrack Culvert [KY-N69-006.00]

Knockbrack Culvert is a single span concrete slab structure with an overall span width of 3m. There are no parapets or safety barriers associated with this structure. The culvert carries the Fahavane Stream below the N69. The Lower River Shannon SAC is located approximately 10.3km downstream of the culvert. Plate 2.28 displays the west elevation.


**Plate 2-28** Knockbrack Culvert.

### 2.2.3.8. Mountcoat Cross Pipe Culvert [KY-N69-013.00]

The Mountcoat Cross Pipe Culvert is a 2-span precast reinforced concrete piped culvert. The span lengths are 0.93m each. There are no masonry parapets on both sides of the carriageway. The structure is located 4.7km upstream of the Lower River Shannon SAC. Plate 2-29 shows the west elevation.

**Plate 2-29** Mountcoat Cross Pipe Culvert.

### 2.2.3.9. Skehanierin Culvert [KY-N69-018.00]

The Skehanierin Culvert is a 3.31m-wide double span concrete slab and pipe culvert which carries the N69 over the Skehanierin River. Masonry parapet walls line the carriageway. The culvert is located 1km upstream of Lower River Shannon SAC. Plate 2.30 displays the east elevation.

**Plate 2-30** Skehanierin Culvert.

### 2.2.3.10. Cloontubbrid South Culvert [KY-N69-019.00]

Cloontubbrid South Culvert is a double span pipe culvert with masonry arch sub-structure. The culvert has an overall span width of 2.7m and carries the N69 over the Cloonmackon stream. There is a concrete post and rail fence on the eastern side and the west has no safety barrier or parapet wall. The Lower River Shannon SAC is approximately 3.9km downstream of the bridge. Plate 2-31 shows the west elevation.


**Plate 2-31** Cloontubbrid South Culvert.

### 2.2.3.11. Cuss North Culvert [KY-N69-022.00]

The Cuss North Culvert is a single span stone masonry arch culvert. The span is 2m. The substructure consists of 2 masonry and concrete abutments. There are masonry parapets on both sides of the carriageway. The structure is located 1.5km upstream of the Lower River Shannon SAC. Plate 2-32 shows the east elevation.

**Plate 2-32** Cuss North Culvert.

### 2.2.3.12. Tarmon East Cross Roads [KY-N69-024.00]

Tarmon East Cross Roads is triple span pipe culvert with concrete slab sub-structure. The overall span width is 5m. Masonry walls line the road above the culvert. The structure carries the N69 over the Tyshe River 6.6km upstream of the Lower River Shannon SAC. Plate 2.33 shows the west elevation.

**Plate 2-33** Tarmon East Cross Roads.

### 2.2.3.13. Curraheen Bridge [KY-N70-016.00]

The Curraheen Bridge is a single span arch bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 3.65m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 400m upstream of the Castlemaine Harbour SAC and located 300m upstream of the Castlemaine Harbour SPA. Plate 2-34 shows the north elevation.


**Plate 2-34** Curraheen Bridge.

### 2.2.3.14. Cummergorm Bridge [KY-N70-020.00]

The Cummergorm Bridge is a 6m-wide triple span concrete slab bridge which carries the N70 over the Curra River. Concrete parapet walls line the carriageway. Castlemaine Harbour SAC and SPA are located 2.8km downstream of the bridge. Plate 2.35 displays the east elevation.


**Plate 2-35** Cummergorm Bridge.

### 2.2.3.15. Loher Bridge [KY-N70-040.40]

Loher bridge is a single span masonry arch with a span width of 2.5m. Masonry parapet walls line the road. The bridge carries the N70 across an unnamed river 1.3km upstream of Ballinskelligs Bay and Inny Estuary SAC. The bridge is located on the downstream boundary of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Plate 2.36a displays the masonry arch of the bridge, while Plate 2.36b displays the view downstream.

**Plate 2-36a** Loher Bridge.

**Plate 2-36b** Loher Bridge.

### 2.2.3.16. Lomanagh South Bridge [KY-N70-050.00]

The Lomanagh South Bridge is a double span masonry arch bridge with an overall length of 17.87m. Masonry parapet walls line the carriageway. The bridge carries the N70 over the Owreagh River 750m upstream of Kenmare River SAC. Plate 2.37 displays the north elevation.

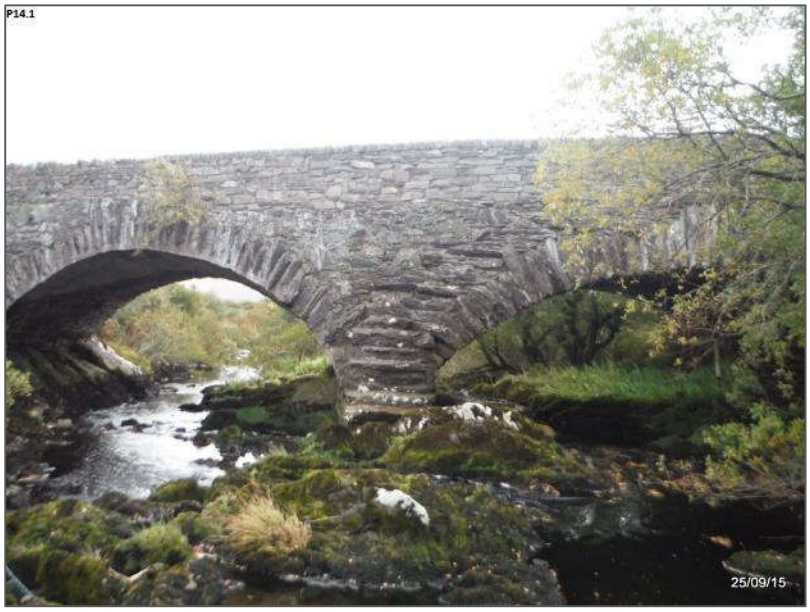



**Plate 2-37** Lomanagh South Bridge.

### 2.2.3.17. Derreenamacken Bridge [KY-N70-052.60]

The Derreenamacken Bridge is a single span stone masonry arch bridge. The span is 3.04m. The substructure consists of 2 masonry abutments. There are no parapets on the structure. The structure is located 150m upstream of the Kenmare River SAC. Plate 2-38 shows the north elevation.

**Plate 2-38** Derreenamacken Bridge.

### 2.2.3.18. McCarthy & O'Leary Memorial Bridge [KY-N71-001.00]

The McCarthy & O'Leary Memorial Bridge is a triple span concrete bridge with an overall length of 77.15m. Steel parapet railings line the carriageway. The bridge carries the N71 over the River Flesk within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and 2km upstream of Killarney National Park SPA. Plate 2.39 displays the face of the structure.


**Plate 2-39** McCarthy & O'Leary Memorial Bridge.

### 2.2.3.19. Muckross Friary Bridge [KY-N71-002.00]

The Muckross Friary Bridge is a 3.6m single span in-situ reinforced concrete bridge with masonry parapets on both sides of the carriageway. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 2-40 shows the west elevation.

**Plate 2-40** Muckross Friary Bridge.

### 2.2.3.20. Torc New Bridge [KY-N71-003.00]

The Torc New Bridge is a 2-span masonry arch bridge with masonry parapets on both sides of the carriageway. The main span is 7.87m and the side span is 2m. The riverbed is uneven but good flow is being maintained. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 2-41 shows the east elevation.

**Plate 2-41** Torc New Bridge.

### 2.2.3.21. Newfoundland Bay Tunnel [KY-N71-005.00]

The Newfoundland Bay Bridge is a rock tunnel. The span is 4.5m. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 2-42 shows the east elevation.

**Plate 2-42** Newfoundland Bay Tunnel.

### 2.2.3.22. River Gweestin Bridge [KY-N72-002.00]

The River Gweestin Bridge is a 3-span masonry arch bridge with masonry parapets on both sides of the carriageway. The maximum span is 3.8m and the minimum span is 3.5m. The riverbed is uneven, and the river is fast flowing. The structure is within the Castlemaine Harbour SAC. Plate 2-43 shows the north elevation.

**Plate 2-43** River Gweestin Bridge.

### 2.2.3.23. Ballymalis Bridge [KY-N72-003.00]

The Ballymalis Bridge is a 5.20m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 0.85m. The structure carries N72 over the stream at Gortnaskarry, a tributary of the River Laune is. The structure is within the Castlemaine Harbour SAC. Plate 2-44 shows the north elevation.

**Plate 2-44** Ballymalis Bridge.

### 2.2.3.24. Cullavaw Bridge [KY-N72-012.00]

Cullavaw Bridge is a double span masonry arch bridge with an overall span width of 8.8m. Masonry parapet walls line the road. The bridge carries the N72 over the Cullavaw Stream, 1.5km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 2.45 displays the south elevation.


**Plate 2-45** Cullavaw Bridge.

### 2.2.3.25. Annagh East Bridge [KY-N86-007.00]

The Annagh East Bridge is a 4.4m single span masonry arch bridge with reinforced concrete arch extension to the south end. The structure carries N86 over the Stream Annagh 23 which is a tributary of the River Lee. There is a metal gate attached to the downstream of the bridge. The structure is within the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA. Plate 2-46 shows the north elevation.

**Plate 2-46** Annagh East Bridge.

### 2.2.3.26. Annagh Glen Bridge [KY-N86-009.00]

The Annagh Glen Bridge is a single span reinforced concrete slab bridge. The span is 2.42m. The substructure consists of 2 reinforced concrete abutments. There are concrete parapets on both sides of the carriageway. The structure is located 430m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 100m upstream of the Tralee Bay Complex SPA. Plate 2-47 shows the north elevation.

**Plate 2-47** Annagh Glen Bridge.

### 2.2.3.27. Derryquay East Bridge [KY-N86-012.00]

The Derryquay East Bridge is a single span bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete slab. The span is 2.85m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 300m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 2-48 shows the north elevation.

**Plate 2-48** Derryquay East Bridge.

### 2.2.3.28. Derryquay School West Culvert [KY-N86-013.00]

The Derryquay School West Culvert is a single span bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete slab. The span is 2.45m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 270m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 2-49 shows the south elevation.

**Plate 2-49** Derryquay School West Culvert.

### 2.2.3.29. The Red Bridge [KY-N86-014.00]

The Red Bridge is a single span stone masonry arch bridge. The span is 2.91m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 250m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 2-50 shows the south elevation.

**Plate 2-50 The Red Bridge.**

### 2.2.3.30. Glasheen Bridge [KY-N86-017.00]

The Glasheen Bridge is a single span stone masonry arch bridge. The span is 3.08m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 300m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 300m upstream of the Tralee Bay Complex SPA. Plate 2-51 shows the north elevation.

**Plate 2-51** Glasheen Bridge.

### 2.2.3.31. Derrymore Bridge [KY-N86-018.00]

The Derrymore Bridge is a single span arch bridge. It is a masonry arch on the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 7.61m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 930m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 900m upstream of the Tralee Bay Complex SPA. Plate 2-52 shows the north elevation.

**Plate 2-52** Derrymore Bridge.

### 2.2.3.32. Mountoven Culvert [KY-N86-022.20]

Mountoven Culvert is a single span masonry arch structure with masonry parapet walls along the road. The bridge carries the N86 over the Cappaclough West Stream. Tralee Bay and Magharees Peninsula, West to Cloghane SAC is located 1.1km downstream of bridge, while Tralee Bay Complex SPA is 1.9km downstream of bridge. Plate 2.53 displays the masonry face of the bridge.

**Plate 2-53** Mountoven Culvert.

## 2.2.4. Limerick

### 2.2.4.1. Creggane Bridge 2 [LC-N20-003.00]

Creggane Bridge 2 is a single span concrete slab structure with an overall span width of 7.21m. Masonry parapet walls are located along the road. The bridge carries the N20 across the River Maigue. The Lower River Shannon SAC is located 28km downstream of the bridge, while the River Shannon and River Fergus Estuaries SPA is approximately 38km downstream of bridge. Plate 2.54 displays the east elevation of the structure.


**Plate 2-54** Creggane Bridge 2.

### 2.2.4.2. Bridge Street Structure Abbeyfeale [LC-N21-001.00]

The Bridge Street Structure, Abbeyfeale, is a single span arch bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 3.32m. The substructure consists of 2 masonry and concrete abutments. There are masonry parapets on both sides of the carriageway. The structure is located 70m upstream of the Lower River Shannon SAC. Plate 2-55 shows the east elevation.

**Plate 2-55** Bridge Street Structure Abbeyfeale.

### 2.2.4.3. Dromtrasna Culvert [LC-N21-001.40]

Dromtrasna Culvert comprises a single span masonry arch structure with a box culvert extension. There is no safety barrier or parapet wall along the roadside. The structure carries the N21 across the Dromtrasna Stream 500m upstream of the Lower River Shannon SAC. Plate 2.56a displays the masonry arch, while Plate 2.56b displays the box culvert.

**Plate 2-56a** Dromtrasna Culvert.

**Plate 2-56b** Dromtrasna Culvert.

### 2.2.4.4. Ballysimon N24 Culvert [LC-N24-011.00]

Ballysimon N24 Culvert is a single span pipe culvert with an overall span width of 6.47m. Timber fencing and steel safety barriers line the road. The culvert carries the N24 over the Groody River, 3.7km upstream of Lower River Shannon SAC and 7.2km upstream of River Shannon and River Fergus Estuaries SPA. Plate 2.57 displays the structure.

**Plate 2-57** Ballysimon N24 Culvert.

### 2.2.4.5. Massy's Bridge [LC-N69-012.00]

Massy's Bridge is a single span masonry arch bridge with concrete slab sub-structure. The overall span width is 3.8m. Concrete parapet walls line the road. The bridge carries the N69 over the Barnakyle Stream 1.1km upstream of Lower River Shannon SAC and 1.7km upstream of River Shannon and River Fergus Estuaries SPA. Plate 2.58 displays the south elevation.


**Plate 2-58** Massy's Bridge.

## 2.2.5. Tipperary

### 2.2.5.1. Nenagh River Bridge [TN-N52-002.00]

The Nenagh River Bridge is a 4-span corrugated steel pipe culvert. The span lengths are around 4.5m. There are masonry with steel railing parapets on both sides of the carriageway. The structure is located 9km upstream of the Lough Derg (Shannon) SPA. Plate 2-59 shows the west elevation.

**Plate 2-59** Nenagh River Bridge.

### 2.2.5.2. Grange Bridge [TN-N52-003.00]

Grange Bridge is a single span masonry arch bridge with concrete slab sub-structure. The overall span width is 3.15m. Concrete parapet walls line the road. The bridge carries the N52 over the Gortadalaun Stream 9.2km upstream of Lough Derg (Shannon) SPA. Plate 2.60 displays the masonry face.

**Plate 2-60** Grange Bridge.

### 2.2.5.3. Balyeiragh Bridge [TN-N65-001.00]

Grange Bridge is a single concrete slab structure. The overall span width is 6.5m. Masonry parapet walls and steel safety barriers line the road. The bridge carries the N65 over the Lorrha Stream within the Lough Derg, North-East Shore SAC and Lough Derg (Shannon) SPA. Plate 2.61 displays the bridge.

**Plate 2-61** Balyeiragh Bridge.

### 2.2.5.4. Carrick-on-Suir Bridge 2 [TS-N24-003.00]

The Carrick-on-Suir Bridge 2 is a single span reinforced concrete slab bridge. The span is 4.85m. The substructure consists of 2 reinforced concrete abutments. There are masonry parapets on both sides of the carriageway. The structure is located 100m upstream of Lower River Suir SAC. Plate 2- 62 shows the south elevation.

**Plate 2-62** Carrick-on-Suir Bridge 2.

### 2.2.5.5. Canal Bridge [TS-N24-006.00]

The Canal Bridge is a 6.1m single span concrete slab. The parapets are masonry with steel railing. The structure is within the Lower River Suir SAC. Plate 2-63 shows the south elevation.

**Plate 2-63** Canal Bridge.

## 2.2.6. Waterford

### 2.2.6.1. Old Pike Bridge [WC-N25-017.00]

Old Pike Bridge is a double span masonry arch structure with an overall length of 11.13m. Masonry parapet walls line the road. The bridge carries the N25 over the Deelish Stream 370m upstream of Dungarvan Harbour SPA. Plate 4.64 shows the south elevation.


**Plate 2-64** Old Pike Bridge.

### 2.2.6.2. Tourig River Bridge [WC-N25-025.00]

The Tourig River Bridge is a 3-span precast prestressed reinforced concrete slab/girder bridge. The span lengths are 31.6m, 38.5m and 32.1m. The substructure consists of 2 reinforced concrete abutments and 2 reinforced concrete piers. There are aluminium parapets on both sides of the carriageway. The structure is within the Blackwater River (Cork/Waterford) SAC and within the Blackwater Estuary SPA. Plate 2-65 shows the east elevation.

**Plate 2-65** Tourig River Bridge.

### 2.2.6.3. Ballyvecane Upper Bridge [WC-N72-000.60]

Ballyvecane Upper Bridge is a single span masonry arch with a width of 9.38m. Masonry parapet walls line the road. The bridge carries the N72 over the Owbeg River. Blackwater River (Cork/Waterford) SAC is located 7km downstream of the bridge. Blackwater Estuary SPA is 19.5km downstream of the bridge. Plate 2.66 displays the masonry face of the bridge.

**Plate 2-66** Ballyvecane Upper Bridge.

### 2.2.6.4. Little Bridge [WC-N72-003.00]

The Little Bridge is a 5-span masonry arch bridge with masonry parapets on both sides of the carriageway. The maximum span is 5.35m and the minimum span is 3.90m. The structure is within the Blackwater River (Cork/Waterford) SAC. All arch barrels have been gunited with 120mm thick sprayed concrete. Plate 2-67 shows the east elevation.

**Plate 2-67** Little Bridge.

### 2.2.6.5. Finisk Bridge [WC-N72-006.00]

The Finisk Bridge is a 4-span masonry arch bridge with reinforced concrete arch extension to the north side. The maximum span is 5.44m and the minimum span is 4.05m. The structure is within the Blackwater River (Cork/Waterford) SAC. Plate 2-68 shows the south elevation.

**Plate 2-68** Finisk Bridge.

# 3. Scope of Study

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

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

## 3.1. Legislative Context

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

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

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

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

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

## 3.2. Appropriate Assessment Process

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009), National Parks and Wildlife Service in 2018[1] (NPWS 2018) and the Office of the Planning Regulator (2021). These guidance documents set out a staged approach to complete the AA process and outline the issues and tests at each stage. The stages outlined below are taken from the guidance document Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2009).

[1] https://www.npws.ie/development-consultations

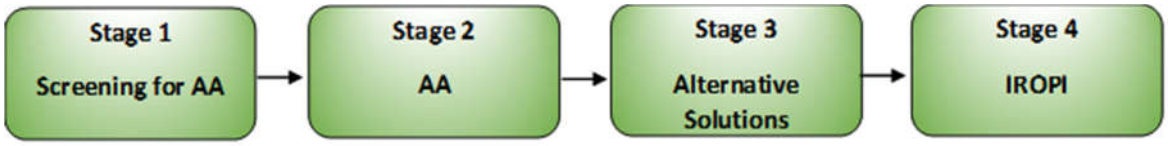



**Figure 3.1 Appropriate Assessment Process (Source: DEHLG, 2009).**

### 3.2.1. Screening for Appropriate Assessment

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

i. Whether a plan or project is directly connected to or necessary for the management of the site, and
ii. Whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

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

### 3.2.2. Appropriate Assessment

Appropriate Assessment considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any necessary mitigation measures.

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

### 3.2.3. Alternative Solutions

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

### 3.2.4. IROPI

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

The AA process only progresses through the full process for certain plans and projects. For example, for a project not connected with the management of a European site and where no likely significant effects on a European site in view of its conservation objectives are identified, the process stops at Screening for AA. Throughout the process the precautionary principle must be applied, which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty (EC, 2001; 2018).

# 4. Methods

## 4.1. Legislation & Guidance Documents

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

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (Habitats Directive);
- Statutory Instrument No. 477/2011 — European Communities (Birds and Natural Habitats) Regulations 2011;
- National Parks and Wildlife Service - Development Consultations2 (NPWS 2018)
- European Commission (2018). Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission;
- Department of the Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities;
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01; and,
- Case C-323/17 People over Wind & Anor. V. Coillte.

## 4.2. Data Collation

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

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

At the outset, a desk study was carried out to collate information available on European sites in the vicinity of bridge sites. These areas were viewed using Google Earth, Google maps[3] and Bing maps[4] and NBDC mapviewer. All bridge locations were also stored as *.kml* files in GoogleEarth to allow sites to be easily located and reviewed.

[2] https://www.npws.ie/development-consultations
[3] https://www.google.ie/maps
[4] http://www.bing.com/maps/

Data sources for the GIS include: -

- EIRSPAN bridge locations and Work Orders.
- National Parks and Wildlife Parks (NPWS) spatial data: Natura 2000 boundaries nationally designated site boundaries, Article 17 reporting records, [redacted]
- Environmental Protection Agency datasets; Water/ Water Framework Directive datasets.
- National Biodiversity Data Centre online data.
- TII invasive species database.
- Species specific datasets obtained from NPWS, as a result of data re uests. Some of these datasets are sensitive in nature, [redacted]
- Species specific data collected as part of ongoing ecological studies or site visits (e.g. data on invasive species collected by Contractor or Resident Engineer).

Geospatial analysis of all data was carried out using MapInfo v.16. In line with established best practice, locations and boundaries of all European sites connected via watercourses to proposed works were identified to establish surface water connectivity between work areas and European sites. The Environmental Protection Agency (EPA) Envision mapping[5] system and datasets were used to identify any hydrological connection between the proposed project and European sites.

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

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

### 4.2.1. Consultation

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

TII recently consulted with the Department of Tourism, Culture, Art, Gaeltacht, Sports and Media (DTCAGSM[1]; dated 17th May 2021) pursuant to the requirements of Regulation 49(9)(c) of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). This consultation related to works on structures in Year 3 of the EIRSPAN Bridge repair project which required preparation of a Natura Impact Statement as well as a number of additional projects to repair damaged culverts. We also consulted on a number of culvert repair jobs within Munster (comments also received in May 2021). All comments received across these consultations have been considered in the current assessment.

### 4.2.2. Procurement of Specialist Surveys

S ecialist surveys are procured for each year of the contract, in particular for bats [redacted] The bridges surveyed each year are dependent on the nature and extent of works to be carried out and the potential for such species to be present at the site, [redacted]

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

[1] This responsibility has recently transferred to the Department of Housing, Local Government and Heritage (DHLGH).

[redacted] Where relevant, the results of these surveys inform the Screening for Appropriate Assessment decisions. All survey data is inputted to the project Geographical Information System database on an ongoing basis.

Under the contract the Contractor has to appoint a suitably qualified ecologist for the duration of the contract to carry out pre-construction surveys, such as invasive species and bats surveys along with checks for any other protected species which may be present in the area and oversee the ecological requirements of the project. All generated reports relating to AA, TII AA determinations and survey data are provided to the Contractor and their appointed ecologist.

In addition to recording information on bats, the ecologists undertaking the bat survey work also recorded other ecological data, including signs of protected species such as Otter (*Lutra lutra*); nesting birds; and invasive species.

### 4.2.3. Protected Species

TII recently consulted with the Department for Housing, Local Government and Heritage (DHLGH) pursuant to the requirements of Regulation 49(9)(c) of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). This consultation related to works on structures in Year 3 of the EIRSPAN Bridge repair project which required preparation of a Natura Impact Statement as well as a number of additional projects to repair damaged culverts. All comments received across these consultations have been considered in the current assessment.

Regulation 51 of the 2011 Birds and Habitats Regulations prohibits the damaging or destruction of a breeding site or resting place referred to in Part 1 of the First Schedule, otherwise known as strictly protected species (species listed in Annex IV of the Habitats Directive). Of particular relevance to this project are strictly protected species such as otter and all bat species. These are discussed below.

#### 4.2.3.1. Otter

The Eurasian Otter (*Lutra lutra*) is widespread throughout all Irish freshwater and most estuarine and coastal habitats (Chapman & Chapman, 1982; Marnell, 2016). The overall conservation status of the otter population in Ireland is reported as being 'Favourable' (NPWS, 2013a; NPWS, 2019) with an overall trend in conservation status of 'Improving' (NPWS, 2019; see also Reid *et al*., 2013).

Otter are protected by a number of legal instruments. Key amongst these is protection under Annex II & IV of the EU Habitats Directive (92/43/EEC), which was transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) and further amended in 2015. Otters, including their breeding and resting places, are also protected under national legislation such as the Birds and Natural Habitats Regulations and the Wildlife Acts 1976 to 2012.

Threats and pressures to otter populations include habitat destruction due to human activity, disease, road casualties and the degradation of water quality which in turn can affect fish biomass (Chanin, 2003). NPWS (2013a) listed a number of pressures on otter, which included road mortalities through road collisions. Roadkill data from 2007-2013 reported 10-30 otters killed on Irish roads each year and road mortalities were considered a medium pressure in 2013. Otters are still killed on Irish roads, however it is not considered to pose a risk to the national conservation status of otter, as road design and the network of mammal underpasses on new roads are positive examples of measures that have been implemented to reduce the mortality of otter on roads (NPWS, 2019). Other threats such as entanglement in fishing nets and diffuse and point-source pollution of freshwater and coastal waterbodies can indirectly impact on otter. However, these threats listed above are considered to be pressures impacting otter on a local rather than a national scale (NPWS, 2019).

The National Roads Authority, now Transport Infrastructure Ireland, has produced guidance documents regarding the crossing of watercourses and considerations for otter during the construction of road schemes; '*Guidelines for the crossing of watercourses during the construction of national road schemes*' and '*Guidelines for the treatment of otters prior to the construction of national road schemes*' (NRA, 2009a & 2009b). These guidelines detail procedures to be taken during construction in the vicinity of otter holts, the destruction of holts under licence, provision of a means

of passage at crossing points (in particular at watercourses) and installation of mammal resistant fencing.

Many of the bridges which are part of this assessment cross rivers where Otter is a qualifying interest of a riverine SAC. In such cases, the Conservation Objective is *to restore the favourable conservation condition of Otter in the …….. SAC*, which is defined by the list of attributes as set out in the Conservation Objectives document for the specific SAC. Rivers where this is relevant include: -

- Blackwater River (Cork/Waterford) SAC (002170)
- Castlemaine Harbour SAC (000343)
- Glengarriff Harbour and Woodland SAC (000090)
- Kenmare River SAC (002158)
- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)
- Lower River Shannon SAC (002165)
- Lower River Suir SAC (002137)
- Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)

As example of the relevant Attributes, in this case for the Blackwater River (Cork/Waterford) SAC (002170), is presented in Table 4.1. This is extracted from the Conservation Objectives for the Blackwater River (Cork/Waterford) SAC (002170) as prepared by NPWS (2012).

**Table 4.1 – Conservation Objectives for Otter in the Blackwater River (Cork/Waterford) SAC (from NPWS, 2012).**

***Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]***

**1355 Otter *Lutra lutra***

**To restore the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:**

| Attribute | Measure | Target | Notes |
|---|---|---|---|
| Distribution | Percentage positive survey sites | No significant decline | Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in south-west estimated at 74.5% (Bailey & Rochford 2006) |
| Extent of terrestrial habitat | Hectares | No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds | No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007) |
| Extent of marine habitat | Hectares | No significant decline. Area mapped and calculated as 647.2ha | No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006) |
| Extent of freshwater (river) habitat | Kilometres | No significant decline. Length mapped and calculated as 599.54km | No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman & Chapman, 1982) |
| Extent of freshwater (lake) habitat | Hectares | No significant decline. Area mapped and calculated as 25.06ha | No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007) |
| Couching sites and holts | Number | No significant decline | Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk & Moorhouse, 1991) |
| Fish biomass available | Kilograms | No significant decline | Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey & Rochford 2006) and wrasse and rockling in coastal waters (Kingston et al. 1999) |
| Barriers to connectivity | Number | No significant increase | Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh & O'Neill, 2010). It is important that such commuting routes are not obstructed |

Each bridge location was considered for its potential to support Otter and in particular for the potential that an Otter holt might be recorded close to the bridge. This matter is returned to in detail below.

[redacted]

#### 4.2.3.2. Bats

In the case of **bats**, each year bridges to be repaired are assessed for the potential to negatively impact upon bats. In 2021 we have commenced the Year 4 assessments and therefore now have access to targeted bat surveys at a range of bridges undertaken over a 4 year period, as well as any historic data. In particular, for example, all masonry bridges where masonry repair works are called up are assessed and where appropriate a bat specialist is procured to survey these structures to check whether they support roosting bats. This involves checking of the structure for potential bat roosts / roosting bats and where necessary a bat emergence survey is undertaken to determine if bats are roosting at a structure. Specialist bat surveyors are procured by Atkins on behalf of TII to undertake this work. Copies of bat survey reports can be provided to the Department if deemed appropriate.

The results inform what repair works can be undertaken and whether e.g. a derogation licence application needs to be submitted to the Department for Housing, Local Government and Heritage (refer to https://www.npws.ie/licences/disturbance/bats-or-otters).

Furthermore, the appointed Contractor has an ecologist on their team who has extensive experience in bat survey and ecology (Caroline Shiel). They co-ordinate any preconstruction checks called up in the bat reports; oversees any mitigation measures required and also oversees the application for derogation licence(s) as appropriate.

As noted, in addition to recording information on bats, the ecologists undertaking the bat survey work also record other ecological data, including signs of protected species such as Otter.

#### 4.2.3.3. Nesting Birds

In the correspondence noted above, the Department notes that while works are to take place between July 1st and September 30th, that this is within the nesting period for birds (i.e. 1st March to 31st August). It should be noted, however, that the proposed works window coincides with the Fisheries Open Season for instream works as defined by Inland Fisheries Ireland (July- September; IFI, 2016) in order to avoid negative impacts to watercourses and fisheries. This does, as noted, present a potential conflict with nesting birds which must be accounted for.

Of particular note is Grey Wagtail (*Motacilla cinerea*), which is Red listed in Birds of Conservation Concern in Ireland (BoCCI) (Gilbert *et al*. 2021). Dipper (*Cinclus cinclus*) also routinely nests on bridges. Both Dipper nests and nest boxes have been encountered during survey work. Dipper is an early nesting species with clutches often started as early as February / March. Other species can, however, also nest on bridges, including for example pied Wagtail (*M. alba*) and Wren (*Troglodytes troglodytes*); on occasion species such as Swallow (*Hirundo rustica*) or House martin (*Delichon urbicum*) can often nest under bridge; including under new concrete bridges. Particular attention was drawn by the Department to Kingfisher (*Alcedo atthis*), a species listed on Annex I of the EU Birds Directive). Kingfisher breed in vertical sand / clay river banks rather than in or on the bridge itself.

A similar approach to the protection of bats is taken to nesting birds.

As noted, in addition to recording information on bats, the ecologists undertaking the bat survey work also record other ecological data, including signs of nesting birds. Where relevant mitigation measures, such as for example the placement of nest boxes for Dipper, are also recommended.

It is a requirement of the Contractor that any nests identified are avoided.

#### 4.2.3.4. Vegetation

In their submission on behalf of the Department (DHLGH), NPWS noted that *"Masonry bridges are a valuable habitat for a myriad of saxicolous vascular, bryophyte and lichen species."* The Department's comments that the "*Removal of vegetation from the bridge surface, parapets and embankments", should be carried out judiciously so as to avoid the wholesale removal of small vascular plants, bryophytes and lichens – their removal should be deemed necessary only for imperative reasons of engineering integrity."*

Section 5.2 presents a short summary of each bridge as well as a recent photograph of the structure. As can be seen from these the bridges subject to works proposals in this assessment support limited amounts of vegetation on the bridge proper. However, these concerns have been noted and communicated to TII with a view to exploring how the need to protect *saxicolous vascular, bryophyte and lichen species* can be integrated into the need to protect a bridge from damage and structural deterioration.

Bridges located within SACs that are designated for species or habitats that may constitute *saxicolous vascular, bryophyte and lichen species,* will be subject to surveys prior to the commencement of works (please see Section 5.8 'Mitigation Measures').

## 4.3. Statement of Authority

The NIS was prepared by Emma Nickelsen, Niamh Sweeney and Paul O'Donoghue.

Emma Nickelsen has a BSc (Hons) in Environmental Biology and an MSc in Marine Biology. Emma has worked in ecological and environmental consultancy since 2017, working on a wide range of projects including bridge works, road construction, local amenity development and renewable energy. A focus of Emma's work to date has been on conducting Appropriate Assessment screenings, ecological appraisals and supporting the preparation of Natura Impact Statements and Ecological Impact Statements. Emma carried out the preparation of this report.

Niamh Sweeney (BSc, MSc (Res)) is a freshwater ecologist with over 10 years' experience in ecological consultancy, with specialisms in macroinvertebrate and diatom taxonomy. Niamh has worked on numerous Screenings for Appropriate Assessment, Natura Impact Statements and Ecological Impact Assessments for private architect firms, waste companies, numerous County Councils, the OPW and Inland Fisheries Ireland. Niamh carried out the preparation of this report.

Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. His is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 18 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive). Paul carried out the technical review of this report.

# 5. Appropriate Assessment

## 5.1. Connectivity of the Works Area to European Sites

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

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

Given nature and scale of the proposed works and localised access requirements for the 68 bridges being considered in this assessment, the maximum distance where works are likely from a bridge is 20m upstream or downstream of a bridge. Thus, direct impacts are anticipated to occur within the immediate vicinity of the bridge.

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

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

**Table 5-1 Bridge location relative to European sites and surface water connectivity.**

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| **CC-N20-019.00** | Blackrock Bridge | Blackwater [Munster] | Blackwater[Munster]_SC_090 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N71-001.00** | Tooreen Bridge | Carrigrour | Glengarriff_SC_010 | No | N/A | No | N/A | Glengarriff Harbour and Woodland SAC 500m d/s of bridge | No |
| **CC-N72-004.00** | Ahane Bridge | Owentaraglin 18 | Blackwater[Munster]_SC_020 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N72-005.00** | Milleenylegane Culvert | Knocknageeha_East | Blackwater[Munster]_SC_030 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 7.8km d/s of bridge | No |
| **CC-N72-006.00** | Cloonbanin Culvert | Skagh | Blackwater[Munster]_SC_030 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 5.7km d/s of bridge | No |
| **CC-N72-007.00** | Drominagh Bridge | Maulyclickeen | Blackwater[Munster]_SC_030 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 4km d/s of bridge | No |
| **CC-N72-010.00** | Leaders Bridge | Allow | Dalua_SC_020 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N72-013.00** | Ketragh Bridge | Awbeg [Kanturk] | Blackwater[Munster]_SC_060 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N72-014.00** | Boland's Bridge | Non-Listed | Blackwater[Munster]_SC_090 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N72-019.00** | Firville Culvert | Scarteen 18 | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 600m d/s of bridge | No |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| **CC-N72-022.00** | Bridge Street Junction, Mallow | South Caherduggan | Blackwater[Munster]_SC_090 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N72-023.00** | Spa Glen Culvert | South Caherduggan | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 500m d/s of bridge | No |
| **CC-N72-024.00** | Spa Walk South, Mallow | South Caherduggan | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 1km d/s of bridge | No |
| **CC-N72-025.00** | Spa Walk Central, Mallow | South Caherduggan | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 1.3km d/s of bridge | No |
| **CC-N72-027.00** | Carrig Bridge | North Caherduggan | Blackwater[Munster]_SC_090 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CC-N73-002.00** | Torpys Cross Road Bridge | Non-EPA Listed Drain | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River SAC ca 2.1km d/s of bridge | No |
| **CC-N73-003.00** | Ballygown Pipe Culvert | Monanimy_Lower | Blackwater[Munster]_SC_090 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 2.4km d/s of bridge | No |
| **CC-N73-005.00** | Ballynamona Bridge | Awbeg [Buttevant] | Blackwater[Munster]_SC_100 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | No |
| **CL-N67-001.00** | Burrane Bridge | Tonavoher | Cloon[Clare]_SC_010 | Yes | Lower River Shannon SAC | No | N/A | Lower River Shannon SAC | River Shannon and River Fergus Estuaries SPA ca. 0.07km d/s of bridge |
| **CL-N67-013.00** | Potter's Wheel Bridge | Non-Listed | KiltumperStream_SC_010 | No | N/A | No | N/A | Land drain that ultimately drains to Carrowmore Dunes SAC ca. 1km d/s of bridge. | Land drain that ultimately drains to Mid-Clare Coast SPA ca. 1km d/s of bridge. |
| **CL-N68-004.00** | Liscasey Bridge West | Liscasey | Owenslieve_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 10.8km d/s of bridge | River Shannon and Fergus Estuaries SPA |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | ca. 10.8km d/s of bridge |
| **KY-N22-023.00** | Brewsterfield Bridge | Flesk [Kerry] | Flesk[Kerry]_SC_020 | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No | N/A | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park SPA ca. 13.5km d/s of bridge |
| **KY-N22-027.00** | Poulgorm Bridge | Flesk [Kerry] | Flesk[Kerry]_SC_010 | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No | N/A | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park SPA ca. 24.2km d/s of bridge |
| **KY-N22-030.00** | Cummeenavrick Culvert #1 | Ford Currimeenavrick | Flesk[Kerry]_SC_010 | No | N/A | No | N/A | Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC ca. 1.2km d/s of bridge | Killarney National Park SPA greater than 30km d/s of bridge |
| **KY-N22-031.00** | Cummeenavrick Culvert #2 | Ford Currimeenavrick | Flesk[Kerry]_SC_010 | No | N/A | No | N/A | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC ca. 1.4km d/s of bridge | Killarney National Park SPA greater than 30km d/s of bridge |
| **KY-N69-004.00** | Knocknacaska Culvert | Knocknacaska | Brick_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 10.6km d/s of bridge | No |
| **KY-N69-005.00** | Knocknacaska Arch | Farran 23 | Brick_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 10.2km d/s of bridge | No |
| **KY-N69-006.00** | Knockbrack Culvert | Fahavane | Brick_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 10.3km d/s of bridge | No |
| **KY-N69-013.00** | Mountcoat Cross Pipe Culvert | Mountcoal 23 | Feale_SC_040 | No | N/A | No | N/A | Lower River Shannon SAC ca. 4.7km d/s of bridge | No |
| **KY-N69-018.00** | Skehanierin Culvert | Skehanierin | Feale_SC_040 | No | N/A | No | N/A | Lower River Shannon SAC ca. 1km d/s of bridge | No |
| **KY-N69-019.00** | Cloontubbrid South Culvert | Cloonmackon | Galey_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 3.9km d/s of bridge | No |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| **KY-N69-022.00** | Cuss North Culvert | Cuss | Galey_SC_020 | No | N/A | No | N/A | Lower River Shannon SAC ca. 1.5km d/s of bridge | No |
| **KY-N69-024.00** | Tarmon East Cross Roads | Tyshe 23 | Galey_SC_020 | No | N/A | No | N/A | Lower River Shannon SAC ca. 6.6km d/s of bridge | No |
| **KY-N70-016.00** | Curraheen Bridge | Ballintleave | Caragh_SC_010 | No | N/A | No | N/A | Castlemaine Harbour SAC ca. 400m d/s of bridge | Castlemaine Harbour SPA ca. 0.3km d/s of bridge |
| **KY-N70-020.00** | Cummergorm Bridge | Curra | Caragh_SC_010 | No | N/A | No | N/A | Castlemaine Harbour SAC ca. 2.8km d/s of bridge | Castlemaine Harbour SPA ca. 2.8km d/s of bridge |
| **KY-N70-040.40** | Loher Bridge | Unnamed Watercourse | Finglasriver[Waterville]_SC_01 | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No | N/A | Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Ballinskelligs Bay and Inny Estuary SAC ca. 1.3km d/s of bridge. | No |
| **KY-N70-050.00** | Lomanagh South Bridge | Owreagh | Sneem_SC_010 | No | N/A | No | N/A | Kenmare River SAC ca. 750m d/s of bridge | No |
| **KY-N70-052.60** | Derreenamacken Bridge | Derreenamackan | Kealduff_SC_010 | No | N/A | No | N/A | Kenmare River SAC ca. 150m d/s of bridge | No |
| **KY-N71-001.00** | McCarthy & O'Leary Memorial Bridge | Flesk [Kerry] | Laune_SC_010 | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No | N/A | Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. | Killarney National Park SPA ca. 2km d/s of bridge |
| **KY-N71-002.00** | Muckross Friary Bridge | Cloghereen | Laune_SC_010 | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Yes | Killarney National Park SPA | No | No |
| **KY-N71-003.00** | Torc New Bridge | Owengarriff (Kerry) | Laune_SC_010 | Yes | Killarney National Park, Macgillycuddy's Reeks and | Yes | Killarney National Park SPA | No | No |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Caragh River Catchment SAC | | | | |
| **KY-N71-005.00** | Newfoundland Bay Tunnel | N/A | N/A | Yes | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Yes | Killarney National Park SPA | No | No |
| **KY-N72-002.00** | River Gweestin Bridge | Gweestin | Laune_SC_020 | Yes | Castlemaine Harbour SAC | No | N/A | No | No |
| **KY-N72-003.00** | Ballymalis Bridge | Gortnaskarry | Laune_SC_020 | Yes | Castlemaine Harbour SAC | No | N/A | No | No |
| **KY-N72-012.00** | Cullavaw Bridge | Cullavaw (Stream) | Blackwater[Munster]_SC_010 | No | N/A | No | N/A | Blackwater River (Cork/Waterford) SAC ca. 1.5km d/s of bridge | No |
| **KY-N86-007.00** | Annagh East Bridge | Annagh 23 | Lee[Tralee]_SC_010 | Yes | Tralee Bay and Magharees Peninsula, West to Cloghane SAC | Yes | Tralee Bay Complex SPA | No | No |
| **KY-N86-009.00** | Annagh Glen Bridge | Undefined | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 430m d/s of bridge | Tralee Bay Complex SPA ca. 0.1km d/s of bridge |
| **KY-N86-012.00** | Derryquay East Bridge | Non-EPA | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge | Tralee Bay Complex SPA ca. 0.2km d/s of bridge |
| **KY-N86-013.00** | Derryquay School West Culvert | Undefined | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 270m d/s of bridge | Tralee Bay Complex SPA ca. 0.2km d/s of bridge |
| **KY-N86-014.00** | The Red Bridge | Non-EPA | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 250m d/s of bridge | Tralee Bay Complex SPA ca. 0.2km d/s of bridge |
| **KY-N86-017.00** | Glasheen Bridge | Undefined | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge | Tralee Bay Complex SPA ca. 0.3km d/s of bridge |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| **KY-N86-018.00** | Derrymore Bridge | Undefined | Lee[Tralee]_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 930m d/s of bridge | Tralee Bay Complex SPA ca. 0.9km d/s of bridge |
| **KY-N86-022.20** | Mountoven Culvert | Cappaclough_West | Owencashla_SC_010 | No | N/A | No | N/A | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 1.1km d/s of bridge | Tralee Bay Complex SPA ca. 1.9km d/s of bridge |
| **LC-N20-003.00** | Creggane Bridge 2 | Maigue | Maigue_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca.28km d.s of bridge | River Shannon and River Fergus Estuaries SPA ca. 38km d/s of bridge |
| **LC-N21-001.00** | Bridge Street Structure Abbeyfeale | Flows To Feale | Feale_SC_020 | No | N/A | No | N/A | Lower River Shannon SAC ca. 70m d/s of bridge | No |
| **LC-N21-001.40** | Dromtrasna Culvert | Dromtrasna | Feale_SC_020 | No | | No | | 500m u/s of Lower River Shannon SAC | No |
| **LC-N24-011.00** | Ballysimon N24 Culvert | Groody | Shannon[Lower]_SC_090 | No | N/A | No | N/A | Lower River Shannon SAC 3.7km d/s of bridge | River Shannon and River Fergus Estuaries SPA ca. 7.2km d/s of bridge |
| **LC-N69-012.00** | Massy's Bridge | Barnakyle | Ballynaclogh_SC_010 | No | N/A | No | N/A | Lower River Shannon SAC ca. 1.1km d/s of bridge | River Shannon and River Fergus Estuaries SPA ca. 1.7km d/s of bridge |
| **TN-N52-002.00** | Nenagh River Bridge | Nenagh | Nenagh_SC_020 | No | N/A | No | N/A | No | Lough Derg (Shannon) SPA ca. 9km d/s of bridge |
| **TN-N52-003.00** | Grange Bridge | Gortadalaun Stream | Nenagh_SC_020 | No | N/A | No | N/A | No | Lough Derg (Shannon) SPA ca. 9.2km d/s of bridge |
| **TN-N65-001.00** | Balyeiragh Bridge | Lorrha Stream | LorrhaStream_SC_010 | Yes | Lough Derg, North-East Shore SAC | Yes | Lough Derg (Shannon) SPA | No | No |
| **TS-N24-003.00** | Carrick-on-Suir Bridge 2 | Glen River | Suir_SC_160 | No | N/A | No | N/A | Lower River Suir SAC ca. 0.1km d/s of bridge. | No |

| Structure ID | Structure Name | River | WFD Subcatchment | Within SAC | SAC Name | Within SPA | SPA Name | Hydrological link to SAC | Hydrological Link to SPA |
|---|---|---|---|---|---|---|---|---|---|
| **TS-N24-006.00** | Canal Bridge | Flows To Suir | Suir_SC_150 | Yes | Lower River Suir SAC | No | N/A | No | No |
| **WC-N25-017.00** | Old Pike Bridge | Deelish Stream | Colligan_SC_010 | No | N/A | No | N/A | No | Dungarvan Harbour SPA ca. 370m d/s of bridge |
| **WC-N25-025.00** | Tourig River Bridge | Tourig | Tourig_SC_010 | Yes | Blackwater River (Cork/Waterford) SAC | Yes | Blackwater Estuary SPA | Blackwater River (Cork/Waterford) SAC | Blackwater Estuary SPA |
| **WC-N72-000.60** | Ballyvecane Upper Bridge | Owbeg (Waterford) | Blackwater[Munster]_SC_130 | No | NA | No | NA | Blackwater River (Cork/Waterford) SAC ca. 7km d/s of bridge. | Blackwater Estuary SPA ca. 19.5km d/s of bridge. SPA is within transitional waterbody. |
| **WC-N72-003.00** | Little Bridge | Glennafallia 18 | Blackwater[Munster]_SC_140 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | No | Blackwater Estuary SPA ca. 16km d/s of bridge. |
| **WC-N72-006.00** | Finisk Bridge | Finisk | Finisk_SC_010 | Yes | Blackwater River (Cork/Waterford) SAC | No | N/A | Blackwater River (Cork/Waterford) SAC | Blackwater Estuary SPA ca. 23km d/s of bridge. |

## 5.2. Description of the Special Areas of Conservation

### 5.2.1. Ballinskelligs Bay and Inny Estuary SAC (000335)

#### Site Overview

"*This site is located at the western end of the Iveragh Peninsula, Co. Kerry, close to the town of Waterville. It comprises the marine waters of Ballinskelligs Bay, as far out as the five-fathom line, some adjoining terrestrial areas and the estuary of the River Inny upstream to Breahig townland. The site extends from Horse Island at the western end of the bay round to Rineen Point at its south-eastern side. Much of the site comprises shallow marine water, Ballinskelligs Bay, but it also supports a wide variety of other habitats, including intertidal mud/sand flats, sandy beaches, shingle, tidal river channels, sea cliffs, wet and dry grassland, freshwater marshes, swamps, cut-away bog, scrub, Bracken and saltmarsh.*

*Two types of saltmarsh occur on the site. Mediterranean salt meadows are characterised by the presence of Sea Rush (*Juncus maritimus*), while species such as Thrift (*Armeria maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*) are typical of Atlantic salt meadows.*

*The site is of considerable conservation significance, particularly for the presence of two types of saltmarsh listed on Annex I of the E.U. Habitats Directive and of a population of* Petalophyllum ralfsii*, a species listed on Annex II of this Directive. Additionally, the site is of significance for the nationally important populations of Common Scoter and Ringed Plover that use it.*"

#### Qualifying Interests

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- *Petalophyllum ralfsii* (Petalwort) [1395]

#### Linkage to Bridges

Ballinskelligs Bay and Inny Estuary SAC (000335) is located: -

- ca. 1.3km d/s of KY-N70-040.40. Loher Bridge.

### 5.2.2. Blackwater River (Cork/Waterford) SAC (002170)

#### Site Overview

"*The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and parts of Cos. Kerry, Limerick, Tipperary and Waterford. The site consists of most of the freshwater stretches of the system as well as the estuarine component at Youghal. Tidal influence extends almost to Cappoquin. The Blackwater rises in the east Kerry uplands where Namurian grits and shales build the low heather-covered plateaux. In the lowlands in the Mallow district it passes over limestone and later cuts through ridges of Old Red Sandstone to the south of Cappoquin. Main tributaries include the Rivers Lickey, Bride, Allow and Awbeg. A wide range of habitats associated with the rivers are included within the site, including substantial areas of woodland (deciduous, mixed), scrub, wet grassland, swamp and marsh vegetation, bog, salt marshes and intertidal sand and mud flats. Areas of improved grassland, arable land and coniferous plantations are included in the site for water quality reasons.*

*The site supports important examples of a range of Annex I habitats, notably estuaries, intertidal mudflats and sandflats, perennial vegetation of stony banks, salt meadows, floating river vegetation, alluvial forests and oak woodlands. Most of these are of good quality and extensive in area. The Blackwater system is an important salmonid fishery and is of high conservation value for* Salmo salar*. Also supports important populations of* Lampetra planeri*,*

L. fluviatilis, Petrom zon marinus *and* Alosa fallax. [redacted] *is widespread throughout the site and has been subject to detailed surveys.* Trichomanes speciosum *occurs at one location. Annex I bird species present in the site include breeding* Egretta garzetta, Alcedo atthis *and* Falco peregrinus *and wintering* Cygnus cygnus *and* Pluvialis apricaria. *A good diversity of other winter waterfowl species also occurs.*"

## Qualifying Interests

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Perennial vegetation of stony banks [1220]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260]
- 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]
- [redacted]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Alosa fallax fallax* (Twaite Shad) [1103]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Trichomanes speciosum* (Killarney Fern) [1421]

## Linkage to Bridges

The following bridges are located within Blackwater River (Cork/Waterford) SAC (002170): -

- CC-N20-019.00. Blackrock Bridge.
- CC-N72-004.00. Ahane Bridge.
- CC-N72-010.00. Leaders Bridge.
- CC-N72-013.00. Ketragh Bridge.
- CC-N72-014.00. Boland's Bridge.
- CC-N72-022.00. Bridge Street Junction, Mallow.
- CC-N72-027.00. Carrig Bridge.
- CC-N73-005.00. Ballynamona Bridge.

- WC-N25-025.00. Tourig River Bridge.
- WC-N72-003.00. Little Bridge.
- WC-N72-006.00. Finisk Bridge.

Blackwater River (Cork/Waterford) SAC (002170) is located: -

- ca. 7.8km d/s of CC-N72-005.00. Milleenylegane Culvert.
- ca. 5.7km d/s of CC-N72-006.00. Cloonbanin Culvert.
- ca. 4km d/s of CC-N72-007.00. Drominagh Bridge.
- ca. 600m d/s of CC-N72-019.00. Firville Culvert.
- ca. 500m d/s of CC-N72-023.00. Spa Glen Culvert.
- ca. 1km d/s of CC-N72-024.00. Spa Walk South, Mallow.
- ca. 1.3km d/s of CC-N72-025.00. Spa Walk Central, Mallow.
- ca 2.1km d/s of CC-N73-002.00. Torpys Cross Road Bridge.
- ca. 2.4km d/s of CC-N73-003.00. Ballygown Pipe Culvert.
- ca. 1.5km d/s of KY-N72-012.00. Cullavaw Bridge.
- ca. 7km d/s of WC-N72-000.60. Ballyvecane Upper Bridge.

### 5.2.3. Carrowmore Dunes SAC (002250)

#### Site Overview

*Fixed dune with herbaceous vegetation is the largest dune habitat present within the site. Typically, the high dunes have an abundant Marram (Ammophila arenaria) cover and in places attain a height of up to 25 m. At the landward side, in the drier sheltered hollows a closed grassy community.*

*Marram dunes occur on the steeper, seaward slopes of the dunes above the beach and at the edges of blow-outs. Typically, the cover of Marram is high and there is little ground vegetation over bare sand. Due to the exposure and high levels of coastal erosion at this site, the embryonic shifting, or fore dunes are not significantly developed, and consist of a loose sand slope grading into the back of the beach. Characteristically, there is much bare sand (typically associated with the first stages of dune building) and the habitat is species-poor, being dominated by Sand Couch (*Elymus farctus*). Unlike similar habitat types in east coast dunes, the intensity of the erosional processes are greater than the depositional ones, so that separate ridges of different ages are not clearly discernible in this dune system.*

*Intertidal reefs occur on the seaward side of the site and are particularly well developed about Magrath's Point at the southern end of the site. Here the shore is moderately exposed to wave action and comprises a wide expanse of shallowly sloping bedrock that is stratified and set at an incline to form shallow ridges and furrows running obliquely or horizontally across the shore. There are extensive rock pools in the mid shore and, below this, an area of unstable boulders, cobbles, pebbles and gravel. The reef is particularly rich in algal and invertebrate species and supports a number of rare taxa.*

*This site contains a relatively small area of intertidal sandflats, comprised of fine to course sand. The main expanse of sandflats occurs along the length of the site before merging northwards and southwards with low exposed reefs.*

*The site supports a population of the rare snail* Vertigo angustior*, a species that is listed on Annex II of the E.U. Habitats Directive. Towards the back of the dune system there are two wetland areas that serve as important refuges for* V. angustior*, particularly in drier summers.*

### Qualifying Interests

- Reefs [1170]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]

### Linkage to Bridges

Carrowmore Dunes SAC (002250) is located: -

- ca. 1km d/s of CL-N67-013.00. Potter's Wheel Bridge.

## 5.2.4. Castlemaine Harbour SAC (000343)

### Site Overview

"*This is a large coastal site occupying the innermost part of Dingle Bay in Co. Kerry. The site comprises the estuaries of the Rivers Maine and Laune, both substantial rivers, and has very extensive areas of intertidal sand and mud flats. The site has a significant sand dune element in the form of Inch and Rosbehy sand spits. These spits, which overlie shingle bars, form the western boundary to the site and provide effective shelter for Castlemaine Harbour. The Inch sand spit, c.5 km in length, has a particularly well developed dune system which grades into salt marsh and Spartina swards on the sheltered east side. A further spit on shingle protrudes into the site at Cromane. Salt marsh fringes this spit and continues almost uninterrupted along the south shore to the mouth of the River Laune. All of the River Laune from the estuary to Lough Leane is included in the site. Other habitats which have a minor presence include wet grassland, reedbeds, heath, scrub and wet woodland. Land uses include fishery and aquaculture activities, grazing, and recreational activities.*

*Site is of major ecological importance for its diversity and range of coastal habitats and species. The Inch sand spit is the largest and arguably one of the best remaining intact dune systems in the country. The dune systems are highly dynamic and possess very fine examples of embryonic dunes, shifting marram dunes, fixed dunes and dune slacks. Salt marshes, both of the Atlantic and Mediterranean types, are also particularly well developed and extensive in area. The site has one of the largest expanses of intertidal sand and mud flats in the country. A fine stand of native alluvial forests occurs on the River Laune. The fixed dunes have* Petalophyllum ralfsii *and three Red Data Book vascular plant species are known from the site. Castlemaine Harbour supports important populations of wintering waterfowl, with internationally important numbers of* Branta bernicla hrota *and nationally important populations of a further 16 species.* Pluvialis apricaria *and* Limosa lapponica*, both listed on Annex I of the EU Birds Directive, occur regularly. The site provides habitat for* Bufo calamita*, a very localised species in Ireland and listed in the Red Data Book. The site is also utilized by* Lutra lutra *and supports important populations of* Salmo salar*,* Petromyzon marinus *and* Lampetra fluviatilis."

### Qualifying Interests

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]

- Annual vegetation of drift lines [1210]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) [2170]
- Humid dune slacks [2190]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- *Petalophyllum ralfsii* (Petalwort) [1395]

### Linkage to Bridges

The following bridges are located within Castlemaine Harbour SAC (000343): -

- KY-N72-002.00. River Gweestin Bridge.
- KY-N72-003.00. Ballymalis Bridge.

Castlemaine Harbour SAC (000343) is located: -

- ca. 400m d/s of KY-N70-016.00. Curraheen Bridge.
- ca. 2.8km d/s of KY-N70-020.00. Cummergorm Bridge.

## 5.2.5. Glengarriff Harbour and Woodland SAC (000090)

### Site Overview

> "*Glengarriff woodland consists of a sizeable area of broadleaved semi-natural woodland comprised of oak (*Quercus *sp.) and Holly (*Ilex aquifolium*), with much Downy Birch (*Betula pubescens*) and Rowan (*Sorbus aucuparia*). A little Yew (*Taxus baccata*) occurs and Strawberry Tree (*Arbutus unedo*) is scattered through the woods. The most frequent ground plants are Heather (*Calluna vulgaris*), Great Wood-rush (Luzula sylvatica), Bilberry (*Vaccinium myrtillus*) and the ferns* Pteridium aquilinum, Blechnum spicant *and* Dryopteris aemula.
>
> *Wet woodland occurs along parts of the Canrooska and Glengarriff rivers. This is dominated by willows (mainly* Salix cinerea *subsp.* oleifolia*) and Downy Birch, with Alder (*Alnus glutinosa*) also frequent. A rich herb layer is found, characterised by such species as Bugle (*Ajuga reptans*), False Brome (*Brachypodium sylvaticum*), Meadowsweet (*Filipendula ulmaria*) and Wood Sanicle (*Sanicula europaea*). The rivers flood regularly, depositing silt within the woodlands.*

*However, there is much small-scale variation in the habitat from heathy places with Heath Bedstraw (*Galium saxatile*), Star Sedge (*Carex echinata*) and Purple Moor-grass (*Molinia caerulea*), to rocks with Goldenrod (*Solidago virgaurea*), Navelwort (*Umbilicus rupestris*) or Filmy-fern (*Hymenophyllum *sp.*). Common woodland herbs include Bugle, Enchanter's-nightshade (*Circaea lutetiana*), Irish Spurge (*Euphorbia hyberna*), Common Cow-wheat (*Melampyrum pratense*) and Foxglove (*Digitalis purpurea*).*

*Although this is the site of an ancient woodland, it was once part of an estate and much of the oak was planted around 1807-1810. Some exotic species were also introduced, such as Beech (*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*) and Rhododendron (*Rhododendron ponticum*). The latter has invaded parts of the woodland, posing a serious problem. However, it is being systematically removed. Other areas within the woodland have been planted with conifers including Sitka Spruce (*Picea sitchensis*), Scots Pine (*Pinus sylvestris*) and Western Hemlock (*Tsuga heterophylla*).*

*In addition to the woodlands, the harbour is of great interest. This sheltered inlet of Bantry Bay has a rocky shore vegetated with brown seaweeds (*Pelvetia caniculata*, Fucus *spp. and* Ascophyllum nodosum*). The inlet also features rocky islets.*

*Adding to the diversity of the site is a wet meadow, adjacent to the woodlands, which supports species such as Ragged-Robin (*Lychnis flos-cuculi*). Smooth Brome (*Bromus racemosus*), an uncommon grass which is listed as 'Vulnerable' in the Red Data Book, occurs within this habitat.*

*The site is notable for the presence in the woodlands of several rare species of Myxomycete fungus, namely* Echinostelium colliculosum, Cribraria tenella, Arcyria affinis, Stemonitis nigrescens, Symphytocarpus impexus, Fuligo muscorum, Diderma deplanatum *and* D. lucidum.

*Invertebrates, too, are well represented. Species found include the Kerry Slug (*Geomalacus maculosus*) a legally protected species, listed on Annex II of the E.U. Habitats Directive; damselflies, such as the Beautiful Demoiselle (*Calyopteryx virgo*, Order Zygoptera), and butterflies (Order Lepidoptera), such as Silver-washed Fritillary (*Argynnis paphia*), Green Hairstreak (*Callophrys rubi*), Purple Hairstreak (*Quercusia quercus*), Large Heath* Coenon m ha tullia , *Holl Blue* Celastrina ar iolus *and Wood White* Le tidea sina is . [redacted] *Other invertebrates reflect the ancient nature of the woodland. For example, Ireland's only arboreal ant (Lasius fulignosis, Order Hymenoptera), a longhorn beetle (*Laptura aurilenta*, Order Coleoptera) and a hoverfly (*Microdon analis*, Order Diptera). Meanwhile, the association between woodland and bog provides the necessary requirements for species such as the Large Marsh Grasshopper (*Stethophyma grossum*, Order Orthoptera) and a horse-fly (*Hybonutra mohlfeldi*, Order Diptera).*"

## Qualifying Interests

- 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]
- *Geomalacus maculosus* (Kerry Slug) [1024]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]
- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

## Linkage to Bridges

Glengarriff Harbour and Woodland SAC (000090) is located: -

- ca. 500m d/s of CC-N71-001.00. Tooreen Bridge.

## 5.2.6. Kenmare River SAC (002158)

### Site Overview

"*Kenmare River is a long and narrow south-west facing bay situated in the south-west of Ireland. It is a deep, drowned glacial valley, approximately 12 km wide at the mouth and 55 km long. Dursey Island marks the south-west point. The bedrock is mainly Old Red Sandstone with Devonian - Carboniferous marine clastics on the south-west coast. It is deeply fissured in a NE/SW direction. The bedrock is emergent throughout the length of the bay. Exposure to prevailing winds and swells at the mouth diminishes toward the head of the bay. Numerous islands and inlets along the length of the bay provide further areas of additional shelter in which a variety of habitats and unusual communities occur. The coastal fringe is dominated by a mosaic of dry and wet heath, along with patches of blanket bog, coastal grassland and exposed rock. The heath is particularly well developed at Derrynane Bay, which supports a fine dune system. Also present are small areas of deciduous woodland and fresh-water marsh.*

*Kenmare River has very high conservation interest, with very good quality examples of large shallow bays, reefs, and marine caves. It has a very wide range of communities from exposed coast to ultra-sheltered areas, and there is an extremely high number (24) of rare and notable species. The sea fan* Swiftia pallida *is only known in Ireland from Kenmare River, where it is recorded in several circalittoral sites.* Eunicella verrucosa*, a widespread but locally distributed sea fan, is recorded at two sites in the lower circalittoral reef. At both sites, it occurs with* Swiftia pallida*, the only place where this association is known to occur. Important habitat forming species present are the seagrass,* Zostera marina*, and the coralline algae,* Lithothamnion corallioides*, which form biogenic reefs. Kenmare River is the only area where the brachiopod,* Neocrania anomala*, is commonly found and, unusually, it occurs in exposed areas. There are two good examples of vegetated shingle banks, and at least 6 separate salt meadows, with both Atlantic and Mediterranean types represented. Shifting marram dunes, fixed dunes and dry heath, the latter with the legally protected plant* Simethis planifolia*, are well represented, while a small though significant example of vegetated sea cliffs occurs in the Derrynane area. The site includes many areas of coastal dry heath. There is a long established population of the mollusc* Vertigo angustior *in the dunes at Derrynane. The site includes areas of Calaminarian grassland about Allihies. The site has internationally important summer and winter roosting sites for* Rhinolophus hipposideros*. It also supports important populations of* Lutra lutra *and* Phoca vitulina*. Sterna terns breed on the islands, mainly* S. paradisaea *but* S. hirundo *in some years and* S. albifrons *at least in 1995.*"

### Qualifying Interests

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- European dry heaths [4030]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Calaminarian grasslands of the *Violetalia calaminariae* [6130]
- Submerged or partially submerged sea caves [8330]
- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]

- *Lutra lutra* (Otter) [1355]
- *Phoca vitulina* (Harbour Seal) [1365]

### Linkage to Bridges

Kenmare River SAC (002158) is located: -

- ca. 750m d/s of KY-N70-050.00. Lomanagh South Bridge.
- ca. 150m d/s of KY-N70-052.60. Derreenamacken Bridge.

## 5.2.7. Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)

### Site Overview

*This is the largest terrestrial site in Ireland and encompasses the mountains and lakes of the Iveragh Peninsula and the Paps range. It is the most mountainous region of Ireland, and includes the highest peak Carrauntoohil at 1039 m. The underlying rock is almost entirely Old Red Sandstone, although carboniferous limestone occurs on the east side of Lough Leane. Glacial processes have shaped the sandstone into dramatic ridges and valleys, including the well wooded Killarney valley. A wide range of semi-natural habitats are present, along with some improved land and forestry in the Caragh River catchment. Generally, the proximity of the site to the Atlantic in the south-west ensures a strong oceanic influence.*

*This site is of great ecological importance. It includes the most extensive oakwoods in the country, with some of the best bryophyte communities in Europe; Ireland's only sizable stand of Yew; excellent examples of blanket bog, alluvial woodland; good quality oligotrophic lakes, some of which support rare glacial relicts; unpolluted rivers with aquatic vegetation and rare invertebrates and fish; and several other annexed habitats. The site also supports 12 Annex II species of flora and fauna, six Annex I bird species and at least 33 Irish Red Data Book species. Many rare bryophytes and invertebrates are also present, several at their only known Irish locations*

### Qualifying Interests

- Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Calaminarian grasslands of the Violetalia calaminariae [6130]
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]
- Blanket bogs (* if active bog) [7130]
- Depressions on peat substrates of the Rhynchosporion [7150]
- 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]
- *Taxus baccata* woods of the British Isles [91J0]
- *Geomalacus maculosus* (Kerry Slug) [1024]
- [redacted]
- *Euphydryas aurinia* (Marsh Fritillary) [1065]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]
- *Lutra lutra* (Otter) [1355]
- *Trichomanes speciosum* (Killarney Fern) [1421]
- *Najas flexilis* (Slender Naiad) [1833]
- *Alosa fallax killarnensis* (Killarney Shad) [5046]

### Linkage to Bridges

The following bridges are located within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365): -

- KY-N22-023.00. Brewsterfield Bridge.
- KY-N22-027.00. Poulgorm Bridge.
- KY-N70-040.40. Loher Bridge.
- KY-N71-001.00. McCarthy & O'Leary Memorial Bridge.
- KY-N71-002.00. Muckross Friary Bridge.
- KY-N71-003.00. Torc New Bridge.
- KY-N71-005.00. Newfoundland Bay Tunnel.

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365) is located: -

- ca. 1.2km d/s of KY-N22-030.00. Cummeenavrick Culvert #1.
- ca. 1.4km d/s of KY-N22-031.00. Cummeenavrick Culvert #2.
- ca. 150m d/s of KY-N70-052.60. Derreenamacken Bridge.

## 5.2.8. Lough Derg, North-East Shore SAC (002241)

### Site Overview

*Lough Derg, the lowest order lake on the River Shannon, is one of the largest bodies of freshwater in Ireland. This SAC, however, only includes the northern shore of the lake from the mouth of the Cappagh River in the north-west to just below Black Lough at the northeastern*

*shore. The greater part of this site lies on Carboniferous limestone, although there is Old Red Sandstone on the southern shores of the eastern section.*

*This is a site of significant ecological interest, with six habitats listed on Annex I of the E.U. Habitats Directive. Four of these are priority habitats - Cladium fen, alluvial woodland, limestone pavement and Yew woodland. Other annexed habitats present include alkaline fen and Juniper scrub formations on heath and calcareous grasslands. In addition, the lake itself is an SPA that supports important numbers of wintering wildfowl, Greenland White-fronted Goose, Common Tern and Cormorant, a number of which are listed under Annex I of the E.U. Birds Directive.*

### Qualifying Interests

- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae [7210]
- Alkaline fens [7230]
- Limestone pavements [8240]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- *Taxus baccata* woods of the British Isles [91J0]

### Linkage to Bridges

The following bridges are located within Lough Derg, North-East Shore SAC (002241): -

- TN-N65-001.00. Balyeiragh Bridge.

## 5.2.9. Lower River Shannon SAC (002165)

### Site Overview

"*A very large, long site approximately 14 km wide and 120 km long, encompassing: the drained river valley which forms the River Shannon estuary; the broader River Fergus estuary, plus a number of smaller estuaries e.g. Poulnasherry Bay; the freshwater lower reaches of the Shannon River, between Killaloe and Limerick, plus the freshwater stretches of much of the Feale and Mulkear catchments; a marine area at the mouth of the Shannon estuary with high rocky cliffs to the north and south; ericaceous heath on Kerry Head and Loop Head; and several lagoons. The underlying geology ranges from Carboniferous limestone (east of Foynes) to Namurian shales and flagstones (west of Foynes) to Old Red Sandstone (at Kerry Head). The salinity of the system varies daily with the ebb and flood of the tide and with annual rainfall fluctuations seasonally.*

*The site contains many Annexed habitats, including the most extensive area of estuarine habitat in Ireland. A good range of Annexed species are also present, including the only known resident population of* Tursiops truncatus *in Ireland, all three Irish species of lamprey, and a good population of* Salmo salar*. A number of birds listed on the EU Birds Directive either winter or breed in the site. The site is internationally important for waterfowl with more than 50,000 individuals occurring in winter. Several species listed in the Irish Red Data Book are present, perhaps most notably the only known Irish populations of* Scirpus triqueter."

### Qualifying Interests

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]

- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260]
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- [redacted]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Tursiops truncatus* (Common Bottlenose Dolphin) [1349]
- *Lutra lutra* (Otter) [1355]

### Linkage to Bridges

The following bridges are located within Lower River Shannon SAC (002165): -

- CL-N67-001.00. Burrane Bridge.

Lower River Shannon SAC (002165) is located: -

- ca. 10.8km d/s of CL-N68-004.00. Liscasey Bridge West.
- ca. 10.6km d/s of KY-N69-004.00. Knocknacaska Culvert.
- ca. 10.2km d/s of KY-N69-005.00. Knocknacaska Arch.
- ca. 10.3km d/s of KY-N69-006.00. Knockbrack Culvert.
- ca. 4.7km d/s of KY-N69-013.00. Mountcoat Cross Pipe Culvert.
- ca. 1km d/s of KY-N69-018.00. Skehanierin Culvert.
- ca. 3.9km d/s of KY-N69-019.00. Cloontubbrid South Culvert.
- ca. 1.5km d/s of KY-N69-022.00. Cuss North Culvert.
- ca. 6.6km d/s of KY-N69-024.00. Tarmon East Cross Roads.
- ca.28km d/s of LC-N20-003.00. Creggane Bridge 2.
- ca. 70m d/s of LC-N21-001.00. Bridge Street Structure Abbeyfeale.

- ca. 500m d/s of LC-N21-001.40. Dromtrasna Culvert.
- ca. 3.7km d/s of LC-N24-011.00. Ballysimon N24 Culvert.
- ca. 1.1km d/s of LC-N69-012.00. Massy's Bridge.
- ca. 0.1km d/s of TS-N24-003.00. Carrick-on-Suir Bridge 2.

## 5.2.10. Lower River Suir SAC (002137)

### Site Overview

"*A very large, long site approximately 14 km wide and 120 km long, encompassing: the drained river valley which forms the River Shannon estuary; the broader River Fergus estuary, plus a number of smaller estuaries e.g. Poulnasherry Bay; the freshwater lower reaches of the Shannon River, between Killaloe and Limerick, plus the freshwater stretches of much of the Feale and Mulkear catchments; a marine area at the mouth of the Shannon estuary with high rocky cliffs to the north and south; ericaceous heath on Kerry Head and Loop Head; and several lagoons. The underlying geology ranges from Carboniferous limestone (east of Foynes) to Namurian shales and flagstones (west of Foynes) to Old Red Sandstone (at Kerry Head). The salinity of the system varies daily with the ebb and flood of the tide and with annual rainfall fluctuations seasonally.*

*The site contains many Annexed habitats, including the most extensive area of estuarine habitat in Ireland. A good range of Annexed species are also present, including the only known resident population of* Tursiops truncatus *in Ireland, all three Irish species of lamprey, and a good population of* Salmo salar*. A number of birds listed on the EU Birds Directive either winter or breed in the site. The site is internationally important for waterfowl with more than 50,000 individuals occurring in winter. Several species listed in the Irish Red Data Book are present, perhaps most notably the only known Irish populations of* Scirpus triqueter."

### Qualifying Interests

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation [3260]
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- [redacted]
- *Petromyzon marinus* (Sea Lamprey) [1095]

- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Tursiops truncatus* (Common Bottlenose Dolphin) [1349]
- *Lutra lutra* (Otter) [1355]

### Linkage to Bridges

The following bridges are located within Lower River Suir SAC (002137): -

- TS-N24-006.00. Canal Bridge.

Lower River Suir SAC (002137) is located: -

- ca. 0.1km d/s of TS-N24-003.00. Carrick-on-Suir Bridge 2.

## 5.2.11. Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)

### Site Overview

"*Tralee Bay and Magharees Peninsula west to Cloghane SAC comprises a very diverse area of important coastal habitats. The site forms a unit of interconnecting coastal habitats stretching from inner Tralee Bay west to Fenit Harbour and Brandon Bay. The Magharee peninsula consists of Lower Carboniferous limestone. Bedrock in the rest of the bay is composed of Middle Carboniferous limestone and Old Red Sandstone. Tralee Bay itself is shallow, sheltered and sedimentary. Subsidiary inlets within Tralee Bay (Bealathaleen Creek and Barrow Harbour) are extremely sheltered. Within the site there are several types of coastal habitat, the dominant and most ecologically important of which are estuarine habitats (mudflats and sandflats not covered by water at low tide, Atlantic and Mediterranean salt meadows & Salicornia swards), dune-complexes ('white-dunes', grey-dunes and dune-slacks) and a lagoon. The site features large expanses of intertidal mudflats, often fringed with saltmarsh vegetation. Distinct areas of estuarine habitat within the site have their own unique characteristics, e.g. Derrymore Island, is unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some Eel-grass beds (*Zostera *spp.) and patches of green algae (e.g.* Ulva *sp. and* Enteromorpha *sp.). The main macro-invertebrate community, which has been noted from the mud-flat areas are a* Hediste-Macoma-Nepthys *community. The dominant invertebrate communities of sandflats within the site are Polychaetes and* Cerastoderma edule *in medium to fine sandy shores and Arenicola marina and bivalves in mid to lower shore muddy flats. In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate: swards of* Spartina anglica *frequently occur in sheltered areas of mudflat particularly in the vicinity of Derrymore Island. Less common are swards of* Salicornia europaea *agg. Saltmarsh vegetation frequently fringes the mudflats & the most important and extensive areas of this habitat are around Blennerville, Derrymore Island and Fermoyle. The dominant type of saltmarsh present is Atlantic salt meadow over mud. Turf fucoids (*Fucus *spp.) are associated with areas of Atlantic salt meadow in the site. Areas of Mediterranean salt meadows are sometimes associated with the above habitat. The site contains a large, shallow, natural sedimentary lagoon Lough Gill (circa. 170ha-200ha). The lagoon has a long artificial sluiced outlet and salinity is rather low (<1% except near the outlet). Shoreline vegetation is composed mainly of reed beds, while aquatic vegetation in the lagoon includes typical species such as* Ruppia maritima. *The fauna includes one lagoon specialist,* Lekanesphaera hookeri. *Sand dunes comprise a significant portion of the terrestrial habitat of this site, including four Annexed habitats: Shifting Dunes along the shoreline with* Ammophila arenaria *(white dunes), Humid dune slacks, Dunes with* Salix repens *and the priority habitat Fixed Dunes with herbaceous vegetation (grey dunes). The dune complex stretches along the southern shoreline of the site from the seaward side of Derrymore Island westward to Cloghane. The most extensive and most important area of the dune*

*complex comprises the Magharees Tombola and it is here that the priority Fixed dune habitat is most extensive within the site.*

*The site is very important in terms of (a) the variety of sublittoral sediment communities in which a number of rare species occur and good examples of littoral and sublittoral reef communities; (b) the extensive intertidal habitats, which support internationally important numbers of wintering waders and wildfowl, including several which are listed in Annex I of the EU Birds Directive, and (c) the fringing coastal habitats, which provide excellent examples of a number of Annexed habitats (most notably the fixed dunes & dune slacks at Maherabeg, which are among the most species-rich examples of these habitats in Ireland, and the lagoon known as Lough Gill, which is important geomorphologically). These coastal habitats also support populations of the Annex II species* Petalophyllum ralfsii*, along with a range of other interesting species of flora and fauna, including the largest Irish breeding population of the Red Data Book species, Natterjack Toad (*Bufo calamita*). This site contains a stand of alluvial woodland that is assigned to the Corylo-Fraxinetum deschampsietosum sub-association. While small in area and subject to disturbance, wet woodland is rare on the Dingle peninsula. The site includes areas of species-rich wet grassland referable to EU Habitats Directive Annex I habitat, Molinia meadows.* Lutra lutra *has a regular presence within the site. The importance of the SAC is enhanced by the fact that it contains two SPAs (Tralee Bay and Lough Gill), two nature reserves (Derrymore Island and Tralee Bay) and a wildfowl sanctuary (Lough Gill).*"

## Qualifying Interests

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Annual vegetation of drift lines [1210]
- Perennial vegetation of stony banks [1220]
- *Salicornia* and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
- Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) [2170]
- Humid dune slacks [2190]
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Lutra lutra* (Otter) [1355]
- *Petalophyllum ralfsii* (Petalwort) [1395]

## Linkage to Bridges

The following bridges are located within Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070): -

- KY-N86-007.00 Annagh East Bridge

Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070) is located: -

- ca. 430m d/s of KY-N86-009.00. Annagh Glen Bridge.
- ca. 300m d/s of KY-N86-012.00. Derryquay East Bridge.
- ca. 270m d/s of KY-N86-013.00. Derryquay School West Culvert.
- ca. 250m d/s of KY-N86-014.00. The Red Bridge.
- ca. 300m d/s of KY-N86-017.00. Glasheen Bridge.
- ca. 930m d/s of KY-N86-018.00. Derrymore Bridge.
- ca. 1.1km d/s of KY-N86-022.20. Mountoven Culvert.

## 5.3. Description of the Special Protection Areas

### 5.3.1. Blackwater Estuary SPA (004028)

#### Site Overview

"*The Blackwater Estuary SPA is a relatively small, sheltered south-facing estuary, which extends from below Youghal Bridge to the Ferry Point peninsula, close to where the river enters the sea. It comprises a section of the main channel of the River Blackwater. At low tide, intertidal flats are exposed. On the eastern side the intertidal channel extending as far as Kinsalebeg and Moord Cross Roads is included, while on the west side the site includes much of the estuary of the Tourig River. The intertidal sediments are mostly muds or sandy muds reflecting the sheltered conditions of the estuary. The sediments have a macrofauna typical of muddy sands, with polychaete worms and bivalves well-represented. Salt marshes occur along the sheltered inlets. A low-lying field which provides an important roost is included.*

*The Blackwater Estuary is of high ornithological importance for wintering waterfowl, providing good quality feeding areas for a diversity of waterfowl species. At high tide, the birds roost along the shoreline and salt marsh fringe. The site supports an internationally important population of* Limosa limosa *(over 5% of the national total). It supports a further eight species in numbers of national importance:* Tadorna tadorna, Anas penelope, Pluvialis apricaria, Vanellus vanellus, Calidris alpina, Numenius arquata, Tringa totanus *and* Tringa nebularia. *A population of* Limosa lapponica *exceeds the threshold for national importance in some winters.* Egretta garzetta *breeds locally and the Blackwater Estuary is a main feeding area. The site is important for gulls and attracts substantial numbers of* Larus fuscus *in autumn and winter. The Blackwater Estuary has been well-studied, with waterfowl counts extending back to 1974.*"

#### Qualifying Interests

- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Wetland and Waterbirds [A999]

#### Linkage to Bridges

The following bridges are located within Blackwater Estuary SPA (004028): -

- WC-N25-025.00. Tourig River Bridge.

Blackwater Estuary SPA (004028) is located: -

- ca. 19.5km d/s of WC-N72-000.60. Ballyvecane Upper Bridge.
- ca. 16km d/s of WC-N72-003.00. Little Bridge.
- ca. 23km d/s of WC-N72-006.00. Finisk Bridge.

## 5.3.2. Castlemaine Harbour SPA (004029)

### Site Overview

"*This is a large coastal site occupying the innermost part of Dingle Bay. It extends from the lower tidal reaches of the Rivers Maine and Laune to west of the Inch and Rossbehy peninsulas (c. 16 km from east to west). The average width of the estuary is 4-5 km though it is c. 11 km at the outer limit. The site comprises the estuaries of the Rivers Maine and Laune, both substantial rivers, and has extensive areas of intertidal sand and mud flats. Conditions are very sheltered due to the presence of three protruding sand spits (Rossbehy, Inch and Cromane), which overlie gravel bars, in the outer part of the Harbour. The intertidal flats are mostly muds or muddy sands and have high densities of polychaete worms, along with bivalves such as* Macoma balthica *and molluscs such as* Hydrobia ulvae. Zostera *is common in places. Salt marshes fringe much of the shoreline. A very large dune system occurs on the Inch peninsula. A substantial area of shallow marine water is included in the site.*

*Castlemaine Harbour SPA is one of the most important sites for wintering waterfowl in the south-west. The complex is of international importance as it regularly supports in excess of 20,000 waterfowl, as well as an internationally important population of* Branta bernicla hrota. *It supports nationally important populations of at least a further seven species:* Gavia stellata, Anas acuta, Anas penelope, Charadrius hiaticula, Calidris alba, Limosa lapponica *and* Tringa nebularia. *The population of* Anas penelope *is over 5% of the national total. The shallow marine waters support divers, and sea duck, including* Melanitta nigra. *The site provides both feeding and a range of roosting areas for the birds.* Pyrrhocorax pyrrhocorax *utilise the dunes at Inch for feeding. It supports a population of* Petalophyllum ralfsii, *a species listed on Annex II of the Habitats Directive.* Lutra lutra *is also found within the site. The site has several Red Data Book plant species, as well as* Bufo calamita *and* Rana temporaria.*"*

### Qualifying Interests

- Red-throated Diver (*Gavia stellata*) [A001]
- Cormorant (*Phalacrocorax carbo*) [A017]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Wigeon (*Anas penelope*) [A050]
- Mallard (*Anas platyrhynchos*) [A053]
- Pintail (*Anas acuta*) [A054]
- Scaup (*Aythya marila*) [A062]
- Common Scoter (*Melanitta nigra*) [A065]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Sanderling (*Calidris alba*) [A144]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Redshank (*Tringa totanus*) [A162]
- Greenshank (*Tringa nebularia*) [A164]
- Turnstone (*Arenaria interpres*) [A169]
- Chough (*Pyrrhocorax pyrrhocorax*) [A346]
- Wetland and Waterbirds [A999]

### Linkage to Bridges

Castlemaine Harbour SPA (004029) is located: -

- ca. 0.3km d/s of KY-N70-016.00. Curraheen Bridge.
- ca. 2.8km d/s KY-N70-020.00. Cummergorm Bridge.

### 5.3.3. Dungarvan Harbour SPA (004032)

#### Site Overview

"*The site is a large east-facing bay, sheltered on the south by Helvick Head and Ballynacourty Point to the north. A narrow north-south shingle spit, which almost divides the bay in two, provides very sheltered conditions for the inner part of the site. The bay is essentially the estuaries of three main rivers, the Brickey, the Colligan and the Glendine. At low tide, very extensive intertidal sand and mud flats are exposed. These have a diverse macro-invertebrate fauna, and* Zostera *is present. Salt marshes often fringe the intertidal flats, especially in the more sheltered areas. The site includes a substantial area of shallow marine water in outer Dungarvan Harbour.*

*This site qualifies for international importance as waterfowl numbers regularly exceed 20,000. It also qualifies as it supports internationally important populations of* Branta bernicla hrota, Limosa limosa *and* Limosa lapponica. *The* Limosa lapponica *population is one of the largest in the country comprising 6.0% of the national total. A further eleven species have populations of national importance, notably* Pluvialis squatarola *(5.9% of total),* Pluvialis apricaria *(3.3% of total),* Calidris alpina *(3.6% of total),* Calidris canutus *(2.8% of total) and* Tadorna tadorna *(3.6% of total). The site provides high quality feeding areas and good roost sites. At high tides, however, roosts outside of the site area are also used. Overall, this is the most important site for waterfowl in County Waterford and is one of the most important in the region.*"

#### Qualifying Interests

- Great Crested Grebe (*Podiceps cristatus*) [A005]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Red-breasted Merganser (*Mergus serrator*) [A069]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Lapwing (*Vanellus vanellus*) [A142]
- Knot (*Calidris canutus*) [A143]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Turnstone (*Arenaria interpres*) [A169]
- Wetland and Waterbirds [A999]

#### Linkage to Bridges

Dungarvan Harbour SPA (004032) is located: -

- ca. 370m d/s of WC-N25-017.00. Old Pike Bridge.

## 5.3.4. Killarney National Park SPA (004038)

### Site Overview

*This large site encompasses the lakes and part of the Macgillycuddy's Reeks in the vicinity of Killarney. The underlying geology is Old Red Sandstone, although Carboniferous limestone occurs on the eastern shores of Lough Leane. Lough Leane is the most important and largest (8.6 km along its long axis) of the lakes, and is classified as a mesotrophic system. Muckross Lake and the Upper Lake are both high quality oligotrophic systems. Killarney National Park is perhaps best known for its Oak woodlands. They form the most extensive area of native woodland remaining in Ireland and include Derrycunihy Wood, described as perhaps the most natural Sessile Oak wood in the country. The woods are typically dominated by* Quercus petraea*, with an understorey of* Ilex aquifolium*.* Arbutus unedo *is a notable component of the woods. The site supports the largest* Taxus baccata *woodland in Ireland. An extensive area of wet woodland, or carr, occurs within the flood plain of Lough Leane. The higher areas of the site are dominated by blanket bog and wet heath. Outcropping rock, cliffs and crags are features of the site.*

*The site is of importance as it supports a good diversity of upland and woodland birds, as well as wintering waterfowl. It is a traditional site for a population of* Anser albifrons flavirostris *- while the numbers are now low, the population is still of importance as it is the most southerly in the country and also feeds entirely on bogs. Upland species which breed within the site include* Falco peregrinus*,* Falco columbarius*,* Lagopus lagopus *and* Turdus torquatus *– the latter two species are Red-listed in Ireland. The extensive woodlands support some scarce breeding birds, notably* Phoenicurus phoenicurus*,* Phylloscopus sibilatrix *and* Sylvia borin*. Several research programmes have been carried out, including studies on the bird communities associated with the woodlands, and the wildfowl associated with the lakes. A range of other notable animal and plant species are associated with this site, including Salvelinus alpinus.*

### Qualifying Interests

- Merlin (*Falco columbarius*) [A098]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]

### Linkage to Bridges

The following bridges are located within Killarney National Park SPA (004038): -

- KY-N71-002.00. Muckross Friary Bridge.
- KY-N71-003.00. Torc New Bridge.
- KY-N71-005.00. Newfoundland Bay Tunnel.

Killarney National Park SPA (004038) is located: -

- ca. 13.5km d/s of KY-N22-023.00. Brewsterfield Bridge.
- ca. 24.2km d/s of KY-N22-027.00. Poulgorm Bridge.
- > 30km d/s of KY-N22-030.00. Cummeenavrick Culvert #1.
- > 30km d/s of KY-N22-031.00. Cummeenavrick Culvert #2.
- ca. 2km d/s of KY-N71-001.00. McCarthy & O'Leary Memorial Bridge.

## 5.3.5. Lough Derg (Shannon) SPA (004058)

### Site Overview

*Lough Derg lies within counties Tipperary, Galway and Clare and is the largest of the River Shannon Lakes, being some 40 km long. Its maximum breadth across the Scarriff Bay - Youghal Bay transect is 13 km but for most of its length it is less than 5 km wide. The lake is relatively shallow at the northern end being mostly 6 m in depth but in the middle region it has an axial trench and descends to over 25 m in places. The narrow southern end of the lake has the greatest average depth, with a maximum of 34 m. The greater part of the lake lies on Carboniferous limestone, but the narrow southern section is underlain by Silurian strata. Most of the lower part of the lake is enclosed by hills on both sides, the Slieve Aughty Mountains to the west and the Arra Mountains to the east. The northern end is bordered by relatively flat, agricultural country. The lake shows the high hardness levels and alkaline pH to be expected from its mainly limestone catchment basin, and it has most recently been classified as a mesotrophic system. The lake has many small islands, especially on its western and northern sides. The shoreline is often fringed with swamp vegetation. Aquatic vegetation includes a range of charophyte species, including the Red Data Book species,* Chara tomentosa*. The shoreline is often fringed by swamp vegetation, comprised of such species as Common Reed (*Phragmites australis*), Great Fen-sedge (*Cladium mariscus*) and Bottle Sedge (*Carex rostrata*).*

*Lough Derg (Shannon) SPA is of high ornithological importance as it supports nationally important breeding populations of Cormorant and Common Tern. In winter, it has nationally important populations of Tufted Duck and Goldeneye, as well as a range of other species including Whooper Swan. The presence of Whooper Swan, Greenland White-fronted Goose, Hen Harrier and Common Tern is of particular note as these are listed on Annex I of the E.U. Birds Directive. Parts of Lough Derg (Shannon) SPA are a Wildfowl Sanctuary*.

### Qualifying Interests

- Cormorant (*Phalacrocorax carbo*) [A017]
- Tufted Duck (*Aythya fuligula*) [A061]
- Goldeneye (*Bucephala clangula*) [A067]
- Common Tern (*Sterna hirundo*) [A193]
- Wetland and Waterbirds [A999]

### Linkage to Bridges

The following bridges are located within Lough Derg (Shannon) SPA (004058): -

- TN-N65-001.00. Balyeiragh Bridge.

Lough Derg (Shannon) SPA (004058) is located: -

- ca. 9km d/s of TN-N52-002.00. Nenagh River Bridge.
- ca. 9.2km d/s of TN-N52-003.00. Grange Bridge.

## 5.3.6. Mid-Clare Coast SPA (004182)

### Site Overview

*The Mid-Clare Coast SPA site extends along the Co. Clare coastline in a south-south-westerly direction from Spanish Point (3 km west of Milltown Malbay) to just west of Doonbeg Bay, a distance of some 14 km. It comprises the mainland shoreline, Mutton Island and Mattle Island, a series of rocky reefs and the open marine water of Mal Bay between the islands and the*

*mainland. Underlying the site are Carboniferous grits which are bedded at a low angle and which give rise to surf conditions in places along the coast. The headlands and islands experience some of the most severe conditions of exposure in Ireland.*

*The Mid-Clare Coast SPA is of high ornithological importance and supports an internationally important population of Purple Sandpiper, and nationally important populations of wintering Barnacle Goose and four wader species. In summer it is utilized by a range of breeding seabirds including a nationally important colony of Cormorant. Of particular note is that Barnacle Goose, Storm Petrel, Golden Plover, Great Northern Diver and Red-throated Diver are listed on Annex I of the E.U. Birds Directive. Part of the Mid-Clare Coast SPA is a Wildfowl Sanctuary*.

### Qualifying Interests

- Cormorant (*Phalacrocorax carbo*) [A017]
- Barnacle Goose (*Branta leucopsis*) [A045]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Sanderling (*Calidris alba*) [A144]
- Purple Sandpiper (*Calidris maritima*) [A148]
- Dunlin (*Calidris alpina*) [A149]
- Turnstone (*Arenaria interpres*) [A169]
- Wetland and Waterbirds [A999]

### Linkage to Bridges

Mid-Clare Coast SPA (004182) is located: -

- ca. 300m d/s of CL-N67-013.00. Potter's Wheel Bridge.

## 5.3.7. River Shannon and River Fergus Estuaries SPA (004077)

### Site Overview

"*The River Shannon and River Fergus Estuaries form the largest estuarine complex in Ireland. The site comprises all of the estuarine habitat west from Limerick City and south from Ennis, extending west as far as Killadysert and Foynes on the north and south shores of the Shannon respectively (a distance of some 25 km from east to west). Also included are several areas in the outer Shannon estuary, notably Clonderalaw Bay and Poulnasherry Bay. The site has vast expanses of intertidal flats. The main macro-invertebrate community is a* Macoma-Scrobicularia-Nereis *community which provides a rich food resource for the wintering birds. Eelgrass (*Zostera *spp.) is present in places. The intertidal flats are often fringed with salt marsh vegetation, areas which provide important high tide roost sites for the birds. In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as* Phragmites australis *and* Scirpus *spp.* Spartina anglica *is frequent in parts.*

*This is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl. It has internationally important populations of* Calidris alpina, Limosa *and* Tringa totanus. *A further 16 species have populations of national importance. The site is particularly significant for* Calidris alpina *(11% of national total),* Pluvialis squatarola *(7.5% of total),* Vanellus vanellus *(6.5% of total),* Tringa totanus *(6.1% of total) and* Tadorna tadorna *(6.0% of total). It has* Cygnus cygnus, Pluvialis apricaria *and* Limosa lapponica *in significant numbers. The site was formerly frequented by a population of* Anser albifrons flavirostris, *but these have now abandoned the area. The site provides both feeding and roosting areas for the wintering birds and habitat quality for most of the estuarine habitats is good*."

### Qualifying Interests

- Cormorant (*Phalacrocorax carbo*) [A017]
- Whooper Swan (*Cygnus cygnus*) [A038]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Wigeon (*Anas penelope*) [A050]
- Teal (*Anas crecca*) [A052]
- Pintail (*Anas acuta*) [A054]
- Shoveler (*Anas clypeata*) [A056]
- Scaup (*Aythya marila*) [A062]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Lapwing (*Vanellus vanellus*) [A142]
- Knot (*Calidris canutus*) [A143]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Greenshank (*Tringa nebularia*) [A164]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Wetland and Waterbirds [A999]

### Linkage to Bridges

River Shannon and River Fergus Estuaries SPA (004077) is located: -

- ca. 0.07km d/s of CL-N67-001.00. Burrane Bridge.
- ca. 10.8km d/s of CL-N68-004.00. Liscasey Bridge West.
- ca. 38km d/s of LC-N20-003.00. Creggane Bridge 2.
- ca. 7.2km d/s of LC-N24-011.00. Ballysimon N24 Culvert.
- ca. 1.7km d/s of LC-N69-012.00. Massy's Bridge.

## 5.3.8. Tralee Bay Complex SPA (004188)

### Site Overview

"*The Tralee Bay Complex SPA is located along the coast of north Co. Kerry between Ballyheige in the north, Tralee in the east and Stradbally in the west. The site includes the inner part of Tralee Bay, including Derrymore Island, the inlets of Barrow Harbour and Carrahane Strand, Akeragh Lough, Lough Gill, and much of the intertidal habitat from*

*Scraggane Point at the northern end of the Magharees Peninsula around the coast to c. 2 km south of Ballyheige.*

*Tralee Bay Complex SPA is an international important site supporting over 20,000 wintering waterbirds, including an international important population of* Branta bernicla hrota. *Nationally important populations of 21 other species also occur at the site including* Cygnus cygnus, Pluvialis apricaria *and* Limosa lapponica."

### Qualifying Interests

- Whooper Swan (*Cygnus cygnus*) [A038]
- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Wigeon (*Anas penelope*) [A050]
- Teal (*Anas crecca*) [A052]
- Mallard (*Anas platyrhynchos*) [A053]
- Pintail (*Anas acuta*) [A054]
- Scaup (*Aythya marila*) [A062]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Lapwing (*Vanellus vanellus*) [A142]
- Sanderling (*Calidris alba*) [A144]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Turnstone (*Arenaria interpres*) [A169]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Common Gull (*Larus canus*) [A182]
- Wetland and Waterbirds [A999]

### Linkage to Bridges

The following bridges are located within Tralee Bay Complex SPA (004188): -

- KY-N86-007.00 Annagh East Bridge

Tralee Bay Complex SPA (004188) is located: -

- ca. 0.1km d/s of KY-N86-009.00. Annagh Glen Bridge.
- ca. 0.2km d/s of KY-N86-012.00. Derryquay East Bridge.
- ca. 0.2km d/s of KY-N86-013.00. Derryquay School West Culvert.

- ca. 0.2km d/s of KY-N86-014.00. The Red Bridge.
- ca. 0.3km d/s of KY-N86-017.00. Glasheen Bridge.
- ca. 0.9km d/s of KY-N86-018.0. Derrymore Bridge.
- ca. 1.9km d/s of KY-N86-022.20. Mountoven Culvert.

## 5.4. Conservation Objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

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

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

Favourable conservation status of a habitat is achieved when: -

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

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

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

Table 5.2 displays links and citations to Conservation Objectives documents for each SAC. These were considered in the preparation of this report and assessment of effects of proposed works on SACs.

**Table 5-2 Conservation Objectives documents of SACs.**

| SAC | Link to report | Citation |
|---|---|---|
| Ballinskelligs Bay & Inny Estuary SAC (000335) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000335.pdf | NPWS (2014). Conservation Objectives: Ballinskelligs Bay and Inny Estuary SAC 000335. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Blackwater River (Cork/Waterford) SAC (002170) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002170.pdf | NPWS (2012). Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Carrowmore Dunes SAC (002250) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002250.pdf | NPWS (2014) Conservation Objectives: Carrowmore Dunes SAC 002250. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Castlemaine Harbour SAC (000343) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000343.pdf | NPWS (2011). Conservation Objectives: Castlemaine Harbour SAC 000343. Version 2.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Glengarriff Harbour & Woodland SAC (000090) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000090.pdf | NPWS (2015). Conservation Objectives: Glengarriff Harbour and Woodland SAC 000090. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Kenmare River SAC (002158) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002158.pdf | NPWS (2013). Conservation Objectives: Kenmare River SAC 002158. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000365.pdf | NPWS (2017) Conservation Objectives: Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC 000365. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht. |
| Lough Derg, North-East Shore SAC (002241) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf | NPWS (2019) Conservation Objectives: Lough Derg, North-east Shore SAC 002241. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht. |
| Lower River Shannon SAC (002165) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf | NPWS (2012). Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Lower River Suir SAC (002137) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf | NPWS (2017) Conservation Objectives: Lower River Suir SAC 002137. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. |

| SAC | Link to report | Citation |
|---|---|---|
| Tralee Bay and Magharees Peninsula, West to Cloghane (002070) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002070.pdf | NPWS (2014). Conservation Objectives: Tralee Bay and Magharees Peninsula, West to Cloghane SAC 002070. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |

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

- Population trend: Measure or percentage change and whether the long-term population trend is stable or increasing.

- Distribution: Number, range, timing and intensity of use of areas. There is to be no significant decrease in the range, timing or intensity of use of areas by bird species, other than that occurring from natural patterns of variation.

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

- To maintain the favourable conservation condition of the non-breeding waterbird Special Conservation Interest species listed for a SPA.

- To maintain the favourable conservation condition of the wetland habitat for a SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

Table 5.3 displays links and citations to Conservation Objectives documents for each SPA. These were considered in the preparation of this report and assessment of effects of proposed works on SPAs.

**Table 5-3 Conservation Objectives documents of SPAs.**

| SPA | Link to report | Citation |
|---|---|---|
| Blackwater Estuary SPA (004028) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004028.pdf | NPWS (2012). Conservation Objectives: Blackwater Estuary SPA 004028. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Castlemaine Harbour SPA (004029) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004029.pdf | NPWS (2011). Conservation Objectives: Castlemaine Harbour SPA 004029. Version 2.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Dungarvan Harbour SPA (004032) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004032.pdf | NPWS (2012). Conservation Objectives: Dungarvan Harbour SPA 004032. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Killarney National Park SPA | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004038.pdf | NPWS (2021) Conservation objectives for Killarney National Park SPA [004038]. Generic Version 8.0. Department of Housing, Local Government and Heritage. |
| Lough Derg (Shannon) SPA | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004058.pdf | NPWS (2021) Conservation objectives for Lough Derg (Shannon) SPA [004058]. Generic Version 8.0. Department of Housing, Local Government and Heritage. |
| Mid-Clare Coast SPA | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004182.pdf | NPWS (2014) Conservation Objectives: Mid-Clare Coast SPA 004182. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| River Shannon and River Fergus Estuaries SPA (004077) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf | NPWS (2012). Conservation Objectives: River Shannon and River Fergus Estuaries SPA 004077. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |
| Tralee Bay Complex SPA (004188) | https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004188.pdf | NPWS (2014). Conservation Objectives: Tralee Bay Complex SPA 004188. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. |

## 5.5. Other Ecological Data

### 5.5.1. Otter

As discussed above a number of bridges are on rivers for which Otter is a qualifying interest. Table 5-4 presented the results of an assessment of the potential for otter holts to occur close to proposed bridge works.

[redacted]

### 5.5.3. Vegetation

As noted, "*Masonry bridges are a valuable habitat for a myriad of saxicolous vascular, bryophyte and lichen species*". These concerns have been noted and communicated to TII with a view to exploring how the need to protect *saxicolous vascular, bryophyte and lichen species* can be integrated into the need to protect a bridge from damage and structural deterioration.

From a review of bridge photographs very few structures supported significant growths of vegetation on the structure itself. It should be noted that these structures are subject to ongoing maintenance and so are not covered by large areas of vegetation. In cases where vegetation was present, the main species noted were moss, Ivy (*Hedera helix hiberncia*), bramble (*Rubus fruticosus* agg.), polypody (*Polypodium* sp.), rustyback (*Ceterach officinarum*), ivy-leaved toadflax (*Cymbalaria muralis*), dandelion (*Taraxacum* agg.), grasses as well as trees such as ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*).

The only SAC in the Munster Region that has a qualifying interest that may constitute *saxicolous vascular, bryophyte and lichen species* and which would possibly grow on bridge structures is the Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC (000365). Killarney Fern (*Trichomanes speciosum*) is a qualifying interest of the SAC and present in eight hectads in the vicinity of Killarney, Muckross lake, Cloonaghlin lake and Lough Currane (NPWS, 2017; NBDC, 2021). Thus, as a precautionary measure, all masonry bridges located within the Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC, where vegetation removal from the structure is proposed, will be subject to surveys prior to the commencement of works (please see Section 5.8 'Mitigation Measures').

Masonry bridges located within the Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC, where vegetation removal from the structure is proposed are: -

- KY-N70-040.40
- KY-N71-002.00
- KY-N71-005.00

**Table 5-4 Review of Structures with respect to Otter.**

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| CC-N20-019.00 Blackrock Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | Yes (2019) |  | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N71-001.00 Tooreen Bridge | No | Glengarriff Harbour and Woodland SAC 500m d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-004.00 Ahane Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | Yes (2021) |   | No mention of otter in the bat survey report<br>Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-010.00 Leaders Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| CC-N72-013.00 Ketragh Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | Yes (2021) |   | No mention of otter in the bat survey report<br>Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-014.00 Boland's Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-019.00 Firville Culvert | No | Blackwater River (Cork/Waterford) SAC ca. 600m d/s of bridge | No |  | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-022.00 Bridge Street Junction, Mallow | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |  | Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| CC-N72-023.00 Spa Glen Culvert | No | Blackwater River (Cork/Waterford) SAC ca. 500m d/s of bridge | No |  | In Urban environment. Spa Glen Culvert is a culvert which is accessed through a manhole in the road carriageway of Spa Square. Immediate environs sub-optimal location for an otter holt. |
| CC-N72-024.00 Spa Walk South, Mallow | No | Blackwater River (Cork/Waterford) SAC ca. 1km d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-025.00 Spa Walk Central, Mallow | No | Blackwater River (Cork/Waterford) SAC ca. 1.3km d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N72-027.00 Carrig Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | Yes (2020) |   | Spraint on rock at downstream face. Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| CC-N73-002.00 Torpys Cross Road Bridge | No | Blackwater River SAC ca 2.1km d/s of bridge | Yes (2020) |   | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N73-003.00 Ballygown Pipe Culvert | No | Blackwater River (Cork/Waterford) SAC ca. 2.4km d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| CC-N73-005.00 Ballynamona Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |  | River banks flanked by GA1; narrow fringe of trees. Farm complex close to upstream side. Suitable locations for holt in woodland upstream of the site. No signs of conditions suitable for an otter holt within ca. 10m of bridge. |
| CL-N67-001.00 Burrane Bridge | Lower River Shannon SAC | Lower River Shannon SAC | No |   | Tidal waters downstream of bridge. Upstream bank and wall not suitable for otter holting near the bridge. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N22-023.00 Brewsterfield Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N22-027.00 Poulgorm Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |   | Immediate environs of bridge sub-optimal location for an otter holt due to concrete abutments / walls. |
| KY-N22-030.00 Cummeenavrick Culvert #1 | No | Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC ca. 1.2km d/s of bridge | No |  | Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N22-031.00 Cummeenavrick Culvert #2 | No | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC ca. 1.4km d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt due to concrete walls. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N69-013.00 Mountcoat Cross Pipe Culvert | No | Lower River Shannon SAC ca. 4.7km d/s of bridge | No |   | Twin culverts – on a small stream with abundant wooded cover. Though a lot of houses are in the area, the potential for an otter holt cannot be discounted. |
| KY-N69-018.00 Skehanierin Culvert | No | Lower River Shannon SAC ca. 1km d/s of bridge | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N69-019.00 Cloontubbrid South Culvert | No | Lower River Shannon SAC ca. 3.9km d/s of bridge | No |   | Due to the level of vegetation / cover near the bridge, potential for an otter holt cannot be discounted. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N69-022.00 Cuss North Culvert | No | Lower River Shannon SAC ca. 1.5km d/s of bridge | Yes (2020) |   | No mention of otter in the bat survey report. Due to the level of vegetation / cover near the bridge, potential for an otter holt cannot be discounted. |
| KY-N70-016.00 Curraheen Bridge | No | Castlemaine Harbour SAC ca. 400m d/s of bridge | Yes (2021) |   | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N70-020.00 Cummergorm Bridge | No | Castlemaine Harbour SAC ca. 2.8km d/s of bridge | Yes (2020) |  | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N70-040.40 Loher Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Ballinskelligs Bay and Inny Estuary SAC ca. 1.3km d/s of bridge. | Yes (2021) |  | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N70-050.00<br>Lomanagh South Bridge | No | Kenmare River SAC ca. 750m d/s of bridge | Yes (2021) |   | Otter prints recorded in mud under arch in the bat survey report.<br>Due to the nature of vegetation / cover near the bridge, potential for an otter holt cannot be discounted.. |
| KY-N70-052.60<br>Derreenamacken Bridge | No | Kenmare River SAC ca. 150m d/s of bridge | Yes (2021) |    | No mention of otter in the bat survey report.<br>Immediate environs of bridge sub-optimal location for an otter holt.<br>[Lesser horseshoe bat were recorded at this structure] |
| KY-N71-001.00<br>McCarthy & O'Leary Memorial Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |   | No mention of otter in the bat survey report.<br>Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N71-002.00 Muckross Friary Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |  | On outskirts of Killarney. Close proximity of woodland notable. Risk of otter holt low but can't be discounted. |
| KY-N71-003.00 Torc New Bridge | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |  | On outskirts of Killarney. Close proximity of woodland notable. Risk of otter holt low but can't be discounted. |
| KY-N71-005.00 Newfoundland Bay Tunnel | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC | No |  | The Newfoundland Bay Bridge is a rock tunnel.<br>Not suitable for Otter. |
| KY-N72-002.00 River Gweestin Bridge | Castlemaine Harbour SAC | No | Yes (2021) |   | Otter spraints were recorded under westernmost arch.<br>Immediate environs of bridge sub-optimal location for an otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N72-003.00 Ballymalis Bridge | Castlemaine Harbour SAC | Castlemaine Harbour SAC | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N72-012.00 Cullavaw Bridge | N/A | Blackwater River (Cork/Waterford) SAC ca. 1.5km d/s of bridge | Yes (2021) |   | Otter spraints were recorded on rocks under the bridge. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-007.00 Annagh East Bridge | Tralee Bay and Magharees Peninsula, West to Cloghane SAC | No | No |   | Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-009.00 Annagh Glen Bridge | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 430m d/s of bridge | No |   | Cover provided by bramble, gorse and *Montbretia*. Location appears suboptimal but the risk of otter holt in the immediate environs of the bridge (rather than at the bridge itself) can't be discounted. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N86-012.00 Derryquay East Bridge | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge | Yes (2020) |   | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-013.00 Derryquay School West Culvert | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 270m d/s of bridge | Yes (2020) |    | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-014.00 The Red Bridge | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 250m d/s of bridge | Yes (2020; 2021) |   | No information on Otter included in bat report. Adjoined by a garden on roadside; farmland on other side. No suitable habitat for holting. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| KY-N86-017.00 Glasheen Bridge | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge | Yes (2021) |  | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-018.00 Derrymore Bridge | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 930m d/s of bridge | Yes (2020; 2021) |  | Otter spraint with crayfish remains on rock under arch (2020). No mention of otter in the bat survey report (2021). Immediate environs of bridge sub-optimal location for an otter holt. |
| KY-N86-022.20 Mountoven Culvert | No | Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 1.1km d/s of bridge | Yes (2020) |  | No mention of otter in the bat survey report. Immediate environs of bridge sub-optimal location for an otter holt. |
| LC-N21-001.00 Bridge Street Structure Abbeyfeale | No | Lower River Shannon SAC ca. 70m d/s of bridge | No |  | Urban environment. Location not suitable for otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| LC-N21-001.40 Dromtrasna Culvert | No | 500m u/s of Lower River Shannon SAC | No |   | Location not suitable for otter holt. Surrounded by open grassy areas. |
| LC-N24-011.00 Ballysimon N24 Culvert | No | Lower River Shannon SAC 3.7km d/s of bridge | No |   | Located close to the M7 interchange at Ballysimon, Limerick. Extensive roadside woodland planting on the north-eastern side. Risk of otter holt low but can't be discounted on the northeastern side. Otter have historically been recorded from close by on the Groody River (Peamount; 1982). |
| LC-N69-012.00 Massy's Bridge | No | Lower River Shannon SAC ca. 1.1km d/s of bridge | No |  | Bridge crosses a tidal creek with open embankments and areas of reedswamp. Holt unlikely to be located at the bridge. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| TN-N65-001.00 Balyeiragh Bridge | Lough Derg, North-East Shore SAC | No | No |  | Location not suitable for otter holt. Surrounded by open grassy areas. |
| TS-N24-003.00 Carrick-on-Suir Bridge 2 | No | Lower River Suir SAC ca. 0.1km d/s of bridge. | No |   | In Urban environment. Location not suitable for otter holt. |
| TS-N24-006.00 Canal Bridge | Lower River Suir SAC | No | No |   | Location not suitable for otter holt. |
| WC-N25-025.00 Tourig River Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |   | Large bridge over mudflats and saltmarsh in the Tourig Estuary; with scrub cover on the landward approaches away from the crossing. Subject to tidal fluctuation around abutments. Location at the river crossing not suitable for otter holt. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| | | | | | Otter likely in wider environment. |
| WC-N72-003.00 Little Bridge | Blackwater River (Cork/Waterford) SAC | No | No |      | Immediate environs of bridge quite open. Historic evidence of Himalayan balsam. Dry arches could be used as couches. Risk of otter holt low but can't be discounted<br>[NBDC – otter spraint noted at Little Bridge in 2015]. |

| Structure ID | Within SAC where Otter is a QI | Hydrological link to SAC | Field Surveys undertaken by an Ecologist | Photo (showing both upstream & downstream) | Comment |
|---|---|---|---|---|---|
| WC-N72-006.00<br>Finisk Bridge | Blackwater River (Cork/Waterford) SAC | Blackwater River (Cork/Waterford) SAC | No |     | Small stream fringed by tree cover in a rural context. Dry arch could be used as couches. Risk of otter holt can't be discounted<br>[NBDC – otter spraint noted at Little Bridge in 2015]. |

[redacted]

## 5.6. Identification of Potential Impacts on European sites

The available information on European sites was reviewed to establish whether or not the proposed works are likely to have a significant effect on the conservation objectives of the designated sites. The likelihood of impacts on the qualifying interests of the European sites identified in this report is based on information collated from the desk study, site plans and other available existing information.

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

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

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

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

### 5.6.1. 'Do Nothing' Impact

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

### 5.6.2. Identification of potential impacts

#### 5.6.2.1. Potential Impacts of proposed works

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

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

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

##### Loss or modification of habitat

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

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

### Disturbance to key species

Key species are defined as those listed on the Annexes of the EU Habitats Directive and Birds Directive for which sites are designated. Disturbance to a species can be direct throu h the h sical disturbance of that s ecies, such as accessin the watercourse and erectin scaffoldin [redacted]

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

### Habitat/ species fragmentation

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

Rivers are corridors for the movement and migration of species. The nature of the proposed works is such that only localised de-watering will be required where necessary, e.g. repair of undermining to a pier or abutment.

The bridges that are single span at which scour repairs are called up are: -

- CL-N67-013.00
- KY-N22-030.00
- KY-N69-006.00
- KY-N70-040.40
- KY-N86-007.00
- KY-N86-009.00
- KY-N86-013.00
- KY-N86-014.00
- LC-N21-001.40

The proposed works at these single span structures will involve localised dewatering. The works will not require the isolation of an entire channel to conduct works and therefore will not result in a barrier to the movement of species at these single span structures. Thus, impacts of habitat and species fragmentation are not anticipated.

### Reduction in species diversity

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

As discussed above, the proposed works could potentially cause the modification of river substrates due to the disturbance and re-settling of accumulated silts upstream of and beneath obstructions in the channel impeding flow, e.g. fallen trees. This impact could affect species such as [redacted] crayfish, salmon and lamprey and indirectly affect otter due to the biomass of their food source being affected.

### Changes in water quality

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

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

## 5.6.3. Categorisation of EIRSPAN work types

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

Table 1-1 details the complete list of potential works that can be called up for each bridge component under the contract. Works that are contained to bridge components such as the Bridge Surface, Footways/median and Expansion Joints are contained in nature and thus, due to the nature of the works and the lack of pathway to a receptor, negative impacts are not anticipated as a result of these works.

The works identified as having potential for negative impacts (Table 5-7) are listed in the Work Orders of the bridges being considered in this assessment. Thus, the works called up for these bridges have the potential to have a negative impact on the receiving environment.

**Table 5-7 Potential negative impacts of work items.**

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

All of the work items listed in Table 5-7 above, which have been identified as having a potential to impact, are part of the Year 4 work order list. These works to have potential to negatively impact a SAC and/or SPA and are listed in Table 5-8.

**Table 5-8 Work items identified in Year 4 works orders as having negative impacts to be considered further.**

| Work Item | Potential Impacts of proposed works |
|---|---|
| 01 Clearance of watercourse | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 03 Removal of vegetation | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity |
| 04 Scour repairs | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 44 Maintenance of gabion | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 45 Maintenance of slope protection | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 47 Reshaping | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 50 Concrete repairs | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 52 High-pressure hosing of surface | Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 55 Repair of parapet | Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 56 Establish base protection | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |
| 57 Maintenance of base protection | Loss or modification of habitat<br>Disturbance to key species<br>Reduction in species diversity<br>Changes in water quality |

| Work Item | Potential Impacts of proposed works |
|---|---|
| 59 Removal of graffiti | Disturbance to key species<br>Changes in water quality |
| 60 Masonry repointing | Disturbance to key species<br>Changes in water quality |
| 61 Masonry repairs | Disturbance to key species<br>Changes in water quality |

### 5.6.4. Potential impacts during the works

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

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

Table 5-9 below details the pathway, receptor and impact for each of the EIRSPAN work types called up in the Work Orders for the 68 bridges.

Table 5-10 details the potential impacts posed at a bridge and the QIs potentially affected. The geographic location of the bridge, proposed works, nature of connectivity to a European site, and the site's structure, function and conservation objectives were considered when determining the potential impacts and QIs within the zone of influence (ZoI).

[redacted]

### 5.6.6. Otter

The potential for impacts on Otter is summarised in Table 5-4. Recommendations with respect to general ecology and protection of Otter in the wider environment are also included below.

### 5.6.7. Potential impacts post completion of the works

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

**Table 5-9 Works categories, potential impacts and receptors.**

| Work Item | Pathway | Potential Impacts | Receptor |
|---|---|---|---|
| 01 Clearance of watercourse | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 03 Removal of vegetation | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species)<br>- Loss or modification of habitat | Annex II species |
| | Surface water | - Indirect reductions in species density<br>- Indirect impacts to surface water quality (Disturbance to key species) | Surface water dependent Annex II species and Annex I habitats |
| 04 Scour repairs | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 44 Maintenance of gabion | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 45 Maintenance of slope protection | Land & Air | - Direct physical disturbance of aquatic species<br>(Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 47 Reshaping | Land & Air | - Direct physical disturbance of aquatic species | Annex II species |

| Work Item | Pathway | Potential Impacts | Receptor |
|---|---|---|---|
| | | (Disturbance to key species) | |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 50 Concrete repairs | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 52 High-pressure hosing of surface | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 55 Repair of parapet | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 56 Establish base protection | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 57 Maintenance of base protection | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect modification of instream substrate quality (Loss or modification of habitat)<br>- Indirect reductions in species density<br>- Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |

| Work Item | Pathway | Potential Impacts | Receptor |
|---|---|---|---|
| 59 Removal of graffiti | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 60 Masonry repointing | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |
| 61 Masonry repairs | Land & Air | - Direct physical disturbance of aquatic species (Disturbance to key species) | Annex II species |
| | Surface water | - Indirect impacts to surface water quality | Surface water dependent Annex II species and Annex I habitats |

**Table 5-10 Potential Impacts to European sites at each bridge.**

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Cork Co. | CC-N20-019.00 | Blackrock Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |
| Cork Co. | CC-N71-001.00 | Tooreen Bridge | Yes | No | Yes | Yes | Otter; Harbour Seal | Potential indirect impacts. Glengarriff Harbour and Woodland SAC 500m d/s of bridge |
| Cork Co. | CC-N72-004.00 | Ahane Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |
| Cork Co. | CC-N72-005.00 | Milleenylegane Culvert | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 7.8km d/s of bridge |
| Cork Co. | CC-N72-006.00 | Cloonbanin Culvert | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 5.7km d/s of bridge |
| Cork Co. | CC-N72-007.00 | Drominagh Bridge | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 4km d/s of bridge |
| Cork Co. | CC-N72-010.00 | Leaders Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |
| Cork Co. | CC-N72-013.00 | Ketragh Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. Previous surveys found vicinity of bridge unsuitable habitat for FWPM |
| Cork Co. | CC-N72-014.00 | Boland's Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Cork Co. | CC-N72-019.00 | Firville Culvert | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 600m d/s of bridge |
| Cork Co. | CC-N72-022.00 | Bridge Street Junction, Mallow | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |
| Cork Co. | CC-N72-023.00 | Spa Glen Culvert | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 500m d/s of bridge |
| Cork Co. | CC-N72-024.00 | Spa Walk South, Mallow | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 1km d/s of bridge |
| Cork Co. | CC-N72-025.00 | Spa Walk Central, Mallow | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 1.3km d/s of bridge |
| Cork Co. | CC-N72-027.00 | Carrig Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |
| Cork Co. | CC-N73-002.00 | Torpys Cross Road Bridge | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River SAC ca 2.1km d/s of bridge |
| Cork Co. | CC-N73-003.00 | Ballygown Pipe Culvert | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River SAC ca 2.4km d/s of bridge |
| Cork Co. | CC-N73-005.00 | Ballynamona Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Clare | CL-N67-001.00 | Burrane Bridge | Yes | Yes | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Estuaries; Mudflats; Large shallow inlets and bays; Reefs; Wetland SCIs of SPA | Potential direct/indirect impacts. Within Lower River Shannon SAC; River Shannon and River Fergus Estuaries SPA ca. 0.07km d/s of bridge |
| Clare | CL-N67-013.00 | Potter's Wheel Bridge | Yes | No | Yes | Yes | Reefs; Wetland SCIs of SPA | Potential indirect impacts. Carrowmore Dunes SAC ca. 1km d/s of bridge; Mid-Clare Coast SPA ca. 1km d/s of bridge. |
| Clare | CL-N68-004.00 | Liscasey Bridge West | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Estuaries; Mudflats; Large shallow inlets and bays; Reefs; Wetland SCIs of SP | Potential indirect impacts. Lower River Shannon SAC/River Shannon and Fergus Estuaries SPA ca. 10.8km d/s of bridge |
| Kerry | KY-N22-023.00 | Brewsterfield Bridge | No | Yes | Yes | Yes | Floating river vegetation; Kerry slug; FWPM; Lamprey; Salmon; Otter; Killarney Fern | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC |
| Kerry | KY-N22-027.00 | Poulgorm Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; Kerry slug; FWPM; Lamprey; Salmon; Otter; Killarney Fern | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Killarney National Park SPA ca. 24.2km d/s of bridge |
| Kerry | KY-N22-030.00 | Cummeenavrick Culvert #1 | Yes | No | Yes | Yes | Floating river vegetation; Kerry slug; FWPM; Lamprey; Salmon; Otter; Killarney Fern | Potential indirect impacts. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC ca. 1.2km d/s of bridge |
| Kerry | KY-N22-031.00 | Cummeenavrick Culvert #2 | Yes | No | Yes | Yes | Floating river vegetation; Kerry slug; FWPM; Lamprey; Salmon; Otter; Killarney Fern | Potential indirect impacts. Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC 1.4km d/s of bridge. Killarney National Park SPA ca. 24.2km d/s of bridge |
| Kerry | KY-N69-004.00 | Knocknacaska Culvert | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 10.6km d/s of bridge |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N69-005.00 | Knocknacaska Arch | No | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 10.2km d/s of bridge |
| Kerry | KY-N69-006.00 | Knockbrack Culvert | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 10.3km d/s of bridge |
| Kerry | KY-N69-013.00 | Mountcoat Cross Pipe Culvert | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 4.7km d/s of bridge |
| Kerry | KY-N69-018.00 | Skehanierin Culvert | Yes | No | Yes | Yes | Estuaries, mudflats, floating river vegetation, FWPM, lamprey, salmon, otter | Potential indirect impacts. Lower River Shannon SAC ca. 1km d/s of bridge |
| Kerry | KY-N69-019.00 | Cloontubbrid South Culvert | No | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 3.9km d/s of bridge |
| Kerry | KY-N69-022.00 | Cuss North Culvert | No | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 1.5km d/s of bridge |
| Kerry | KY-N69-024.00 | Tarmon East Cross Roads | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Dolphin; Floating river vegetation; Estuaries; Mudflats; Large shallow inlets and bays; Reefs | Potential indirect impacts. Lower River Shannon SAC ca. 6.6km d/s of bridge |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N70-016.00 | Curraheen Bridge | Yes | No | Yes | Yes | Lamprey; Salmon; Otter; Estuaries; Mudflats | Potential indirect impacts. Castlemaine Harbour SAC ca. 400m d/s of bridge |
| Kerry | KY-N70-020.00 | Cummergorm Bridge | Yes | No | Yes | Yes | Estuaries, mudflats, lamprey, salmon, otter | Potential indirect impacts. Castlemaine Harbour SAC ca. 2.8km d/s of bridge |
| Kerry | KY-N70-040.40 | Loher Bridge | Yes | Yes | Yes | Yes | Lamprey, Salmon, Otter, Killarney Fern, Salt meadows | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (downstream boundary). Ballinskelligs Bay and Inny Estuary SAC ca. 1.3km d/s of bridge. |
| Kerry | KY-N70-050.00 | Lomanagh South Bridge | No | No | Yes | Yes | Large shallow inlets and bays, otter, harbour seal | Potential indirect impacts. Kenmare River SAC ca. 750m d/s of bridge |
| Kerry | KY-N70-052.60 | Derreenamacken Bridge | Yes | Yes | Yes | Yes | Large shallow inlets and bays; Reefs ; Otter; Harbour Seal; Lesser Horseshoe Bat | Potential indirect impacts. Kenmare River SAC ca. 150m d/s of bridge. Bridge supports roosting Lesser horseshoe bat a QI of Kenmare River SAC. |
| Kerry | KY-N71-001.00 | McCarthy & O'Leary Memorial Bridge | Yes | Yes | Yes | Yes | Oligotrophic waters; Floating river vegetation; Lamprey; Salmon; Otter; Lesser Horseshoe Bat; Slender Naiad; Killarney Fern; Greenland White-fronted Goose | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC and 2km upstream of Killarney National Park SPA. |
| Kerry | KY-N71-002.00 | Muckross Friary Bridge | Yes | Yes | Yes | Yes | Oligotrophic waters; Floating river vegetation; Lamprey; Salmon; Otter; Lesser Horseshoe Bat; Slender Naiad; Killarney Fern; Greenland White-fronted Goose | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N71-003.00 | Torc New Bridge | Yes | Yes | Yes | Yes | Oligotrophic waters; Floating river vegetation; Lamprey; Salmon; Otter; Lesser Horseshoe Bat; Slender Naiad; Killarney Fern; Greenland White-fronted Goose | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. |
| Kerry | KY-N71-005.00 | Newfoundland Bay Tunnel | Yes | Yes | Yes | No | Lesser Horseshoe Bat; Slender Naiad; Killarney Fern | Potential direct/indirect impacts. Within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. |
| Kerry | KY-N72-002.00 | River Gweestin Bridge | Yes | Yes | Yes | Yes | Estuaries, Mudflats; Lamprey; Otter; Salmon | Potential direct/indirect impacts. Within Castlemaine Harbour SAC |
| Kerry | KY-N72-003.00 | Ballymalis Bridge | Yes | Yes | Yes | Yes | Estuaries, Mudflats; Lamprey; Otter; Salmon | Potential direct/indirect impacts. Within Castlemaine Harbour SAC |
| Kerry | KY-N72-012.00 | Cullavaw Bridge | Yes | No | Yes | Yes | Floating river vegetation; FWPM; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 1.5km d/s of bridge |
| Kerry | KY-N86-007.00 | Annagh East Bridge | Yes | Yes | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential direct/indirect impacts. Within Tralee Bay and Magharees Peninsula, West to Cloghane SAC and Tralee Bay Complex SPA |
| Kerry | KY-N86-009.00 | Annagh Glen Bridge | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 430m d/s of bridge. Tralee Bay Complex SPA ca. 100m d/s of bridge |
| Kerry | KY-N86-012.00 | Derryquay East Bridge | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge. Tralee Bay Complex SPA ca. 200m d/s of bridge |
| Kerry | KY-N86-013.00 | Derryquay School West Culvert | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 270m d/s of bridge. Tralee Bay Complex SPA ca. 200m d/s of bridge |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Kerry | KY-N86-014.00 | The Red Bridge | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 250m d/s of bridge. Tralee Bay Complex SPA ca. 200m d/s of bridge |
| Kerry | KY-N86-017.00 | Glasheen Bridge | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 300m d/s of bridge. Tralee Bay Complex SPA ca. 300m d/s of bridge |
| Kerry | KY-N86-018.00 | Derrymore Bridge | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 900m d/s of bridge. Tralee Bay Complex SPA ca. 930m d/s of bridge |
| Kerry | KY-N86-022.20 | Mountoven Culvert | Yes | No | Yes | Yes | Estuaries, Mudflats; Large shallow inlets and bays; Reefs; Otter; Wetland SCIs of SPA | Potential indirect impacts. Tralee Bay and Magharees Peninsula, West to Cloghane SAC ca. 1.1km d/s of bridge. Tralee Bay Complex SPA ca. 1.9 d/s of bridge |
| Limerick | LC-N20-003.00 | Creggane Bridge 2 | No | No | No | Yes | Floating river vegetation; Lamprey; Salmon; Otter | Potential indirect impacts. Lower River Shannon SAC ca.28km d/s of bridge. River Shannon and River Fergus Estuaries SPA ca. 38km d/s of bridge |
| Limerick | LC-N21-001.00 | Bridge Street Structure Abbeyfeale | Yes | No | Yes | Yes | Floating river vegetation; FWPM; Lamprey; Salmon; Otter | Potential indirect impacts. Lower River Shannon SAC ca. 70m d/s of bridge |
| Limerick | LC-N21-001.40 | Dromtrasna Culvert | Yes | No | Yes | Yes | Floating river vegetation; Lamprey; Salmon; Otter | Potential indirect impacts. Lower River Shannon SAC ca. 500m d/s of bridge |
| Limerick | LC-N24-011.00 | Ballysimon N24 Culvert | Yes | No | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential indirect impacts. Lower River Shannon SAC 3.7km d/s of bridge; River Shannon and River Fergus Estuaries SPA ca. 7.2km d/s of bridge |
| Limerick | LC-N69-012.00 | Massy's Bridge | Yes | No | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential indirect impacts. Lower River Shannon SAC 1.1km d/s of bridge; River Shannon and River Fergus Estuaries SPA ca. 1.7km d/s of bridge |

| County | Structure ID | Structure Name | Loss or modification of habitat | Physical disturbance of species | Reduction in species density | Deterioration in surface water quality | QIs within ZoI (via direct or indirect impacts) | Rationale |
|---|---|---|---|---|---|---|---|---|
| Tipperary North | TN-N52-002.00 | Nenagh River Bridge | Yes | No | Yes | Yes | Wetland SCIs of SPA | Potential indirect impacts. Lough Derg (Shannon) SPA ca. 9km d/s of bridge |
| Tipperary North | TN-N52-003.00 | Grange Bridge | Yes | No | Yes | Yes | Wetland SCIs of SPA | Potential indirect impacts. Lough Derg (Shannon) SPA ca. 9.2km d/s of bridge |
| Tipperary North | TN-N65-001.00 | Balyeiragh Bridge | Yes | No | Yes | Yes | Fens; Wetland SCIs of SPA | Potential indirect impacts. Within Lough Derg, North-East Shore SAC. Within Lough Derg (Shannon) SPA |
| Tipperary South | TS-N24-003.00 | Carrick-on-Suir Bridge 2 | Yes | No | Yes | Yes | Floating river vegetation; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential indirect impacts. Lower River Suir SAC ca. 0.1km d/s of bridge. |
| Tipperary South | TS-N24-006.00 | Canal Bridge | Yes | Yes | Yes | Yes | Floating river vegetation; White-clawed Crayfish; Lamprey; Salmon; Otter | Potential direct/indirect impacts. Within Lower River Suir SAC |
| Waterford | WC-N25-017.00 | Old Pike Bridge | No | No | No | Yes | Wetland SCIs of SPA | Potential indirect impacts. Dungarvan Harbour SPA ca. 370m d/s of bridge |
| Waterford | WC-N25-025.00 | Tourig River Bridge | Yes | Yes | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; White-clawed crayfish; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA |
| Waterford | WC-N72-000.60 | Ballyvecane Upper Bridge | Yes | No | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; White-clawed crayfish; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential indirect impacts. Blackwater River (Cork/Waterford) SAC ca. 7km d/s of bridge. Blackwater Estuary SPA ca. 19.5km d/s of bridge. |
| Waterford | WC-N72-003.00 | Little Bridge | Yes | Yes | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; White-clawed crayfish; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. Blackwater Estuary SPA ca. 16km d/s of bridge. |
| Waterford | WC-N72-006.00 | Finisk Bridge | Yes | Yes | Yes | Yes | Estuaries; Mudflats; Floating river vegetation; White-clawed crayfish; Lamprey; Salmon; Otter; Wetland SCIs of SPA | Potential direct/indirect impacts. Within Blackwater River (Cork/Waterford) SAC. Blackwater Estuary SPA ca. 23km d/s of bridge. |

## 5.7. In-combination Impacts

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

The Office of Public Works (OPW) has 16 arterial drainage and embankment schemes in the Munster Region. A number of bridges are located within the same WFD catchment as the schemes but do not have hydrologically connectivity with the schemes. Six bridges fall either within or are located upstream of a scheme. Four bridges are within a scheme. The OPW has carried out a Strategic Environmental Assessment and NIS of the drainage maintenance activities for 2016-2021. Maintenance activities will have to under-go the AA process to ensure no adverse impacts to European sites and their designated habitats and species. Mitigation measures are set out in the SEA and NIS[6], which require further project-specific assessments to be carried out. Thus, given the nature and scale of the proposed routine maintenance bridge works, in-combination impacts with the OPW drainage programme are not anticipated.

**Table 5-11 Bridges within / upstream of an OPW works scheme.**

| Bridge Code | Location relative to OPW scheme | OPW scheme (County) |
|---|---|---|
| **LC-N20-003.00** | Within | Maigue (Limerick) |
| **LC-N24-011.00** | Within | Groody (Limerick) |
| **LC-N69-012.00** | Within | Maigue Outfall (Limerick) |
| **TN-N52-002.00** | Within | Nenagh (Tipperary) |
| **TN-N52-003.00** | Within | Nenagh (Tipperary) |
| **TS-N24-003.00** | Within | Carrick-on-Suir FRS (Tipperary) |

Farmers and landowners may also undertake general agricultural operations in areas adjacent to the proposed work areas at each bridge, which could potentially give rise to impacts of a similar nature to those arising from the proposed works. This could potentially result in an additional increased risk to water quality of the watercourses downstream of the bridges. Many agricultural operations are periodic, not continuous in nature, and qualify as a Notifiable Action that requires consultation with National Parks and Wildlife Service in advance of the works e.g. reclamation, infilling or land drainage within 30m of the river, removal of trees or any aquatic vegetation within 30m of the river, and harvesting or burning of reed or willow[7]. Agricultural operations must also comply with the EC (Environmental Impact Assessment) (Agriculture) Regulations 2011 and amendment 2017 S.I. No. 456/2011 and 407/2017 in relation to activities covered by the regulations: -

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

A Natura Impact Statement is required under Regulation 9 if it is likely to have a significant effect on a European designated site. The drainage or reclamation of wetlands is controlled under the Planning and Development (Amendment) (No. 2) Regulations 2011 and the European Communities (Amendment to Planning and

[6] https://www.opw.ie/en/flood-risk-management/operations/environmentalactivities/arterial-drainage-maintenance-sea-2018-20121/
[7] Notifiable Actions https://www.npws.ie/farmers-and-landowners/notifiable-actions

Development) Regulations 2011. Therefore, the in-combination effects of agricultural operations and the proposed culvert works are not likely to be significant.

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

A number of road schemes are proposed in the Munster Region[8]. Examples of such infrastructure projects include are listed below. These road projects are all at different stages of design and procurement. These projects will be or would have been subject to Screening for AA, at a minimum. However, as the proposed bridge maintenance works will be carried out during 2021, and due to their scale and temporary nature, in-combination impacts are not anticipated.

**Table 5-12 TII Road Schemes in the Munster Region.**

| Road Scheme | Region | Phase |
|---|---|---|
| **N11 Oilgate to Rosslare** | South East | Phase 2 - Options Selection |
| **N21 Abbeyfeale Relief Road** | South West | Phase 2 - Options Selection |
| **N21 Newcastlewest Relief Road** | South West | Phase 2 - Options Selection |
| **N22 Farranfore to Killarney** | South West | Phase 2 - Options Selection |
| **N24 Cahir to Limerick Junction** | South West | Phase 2 - Options Selection |
| **N24 Cahir to Waterford** | South East | Phase 2 - Options Selection |
| **N25 Carrigtwohill to Middleton** | South West | Phase 2 - Options Selection |
| **N20 Cork to Limerick** | South West | Phase 2 - Options Selection |
| **N21/N69 Limerick to Adare to Foynes** | South West | Phase 4 - Statutory Processes |
| **N72/N73 Mallow Relief Road** | South West | Phase 2 - Options Selection |
| **N28 Cork to Ringaskiddy** | South West | Phase 4 - Statutory Process - Judicial Review |
| **N69 Listowel Bypass** | South West | Phase 5 - Enabling and Procurement |
| **N8/N25 Dunkettle Interchange** | South West | Phase 6 - Construction and Implementation |
| **N22 Ballyvourney to Macroom** | South West | Phase 6 - Construction and Implementation |
| **N72 Stagmount** | South West | Phase 6 - Construction and Implementation |

[8] TII Road Scheme Activity MapViewer https://www.tii.ie/projects/road-schemes/#

## 5.8. Mitigation Measures

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

### 5.8.1. Cork

#### 5.8.1.1. Blackrock Bridge [CC-N20-019.00]

Blackrock Bridge is a 5-span concrete slab bridge with an overall length of 114.3m. There are steel parapet railings along the carriageway. The bridge carries the N20 over the River Blackwater within the Blackwater River (Cork/Waterford) SAC. Plate 5.2 displays the eastern face of the structure.

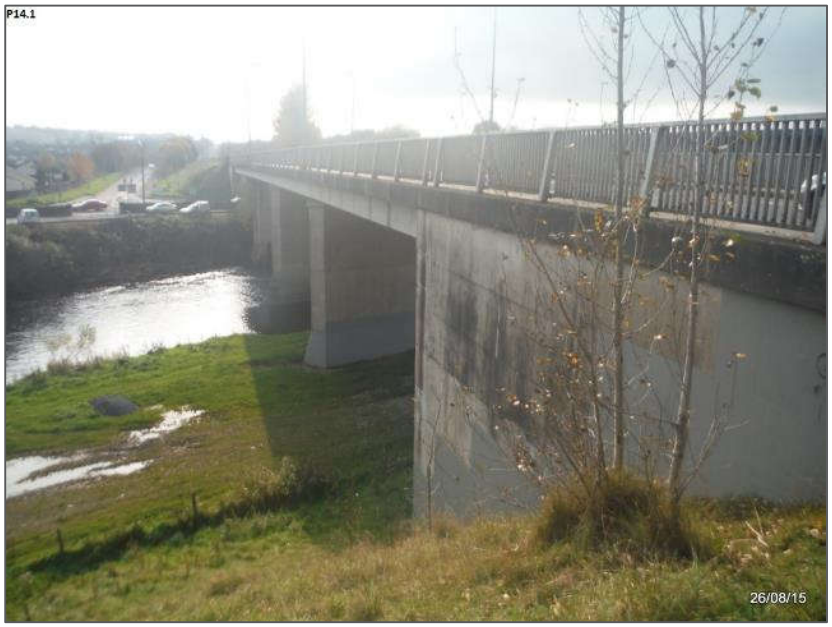



**Plate 5-2** Blackrock Bridge.

The qualifying interests of River Blackwater within the Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation, [redacted] white-clawed crayfish, lamprey, salmon, otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are NPWS records for freshwater pearl mussel 1.8km downstream of the bridge. These are a ualif in interest of the SAC. No freshwater earl mussels were found durin the 2021 surve . [redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Minor clearance of the watercourse to the second pier from the south. ($2m^2$) | Screened In. Instream works required |
| Embankments/Revetments | Removal of vegetation. 1m wide strip to all embankments. ($40m^2$) | Screened out. Vegetation is not QI of the SAC |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Wing/Spandrel/Retaining Walls | Ivy removal from Northwest wing wall and Southwest wing wall. (1m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Piers | Ivy removal from the south face of the north pier. (4m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Piers | Moss removal from the base of the second pier counting from the north. (15m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Cleaning of drain gullies to primary passage road surface. (12 no.) | Screened out. Works restricted to bridge deck |
| Wing/Spandrel/Retaining Walls | Repair spalling with exposed reinforcement at two locations of the Northeast wing wall, at Southwest wing wall close to the abutment and next to the joint in the Northwest wing wall. (2m$^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |
| Piers | 20m2 concrete repairs to Piers: -<br>Concrete repairs to the capping beams to the piers. Hollow/delaminated concrete is to be removed, exposed steel treated and concrete cover reinstated. Repair areas of spalling to the south and north piers. Atkins RE to be invited on site to inspect the capping beams to ensure all hollow concrete is removed. | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |
| Abutments | Concrete repairs to the north abutment where exposed steel has previously been overpainted. The graffiti paint is to be cleaned back, the steel treated correctly and the concrete cover reinstated. (3m$^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Repair spalling to the deck at the west side of span 1 counting from south. Concrete repairs to the parapet facade panels (4m$^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Remove graffiti at the Northwest wing wall. (6m$^2$) | Screened out. Works restricted areas over land and will be conducted by hand |

## Mitigation Measures

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on River Blackwater within the Blackwater River (Cork/Waterford) SAC.

### 5.8.1.2. Tooreen Bridge [CC-N71-001.00]

Tooreen Bridge is a single span masonry arch bridge with an overall length of 5.23m. There are masonry parapet walls along the road carriageway. The bridge carries the N71 across the Carrigrour River. Glengarriff Harbour and Woodland SAC is located 500m downstream of the bridge. Plate 5.3 displays the east elevation of the bridge.


**Plate 5-3** Tooreen Bridge.

The qualifying interests of Glengarriff Harbour and Woodland SAC are listed in Section 5.2. The qualifying interests that could be impacted are Otter and Harbour Seal. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are NPWS records for freshwater pearl mussel 4km downstream of the bridge. This is not a qualifying interest of the SAC. However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | All trees, bushes and deep rooted vegetation within 1m of structure to be removed (20m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | All debris, silt and vegetation to be removed from bridge drainage gullies (2 no.) | Screened out. Contained to bridge deck |
| Embankments/Revetments | Maintenance of rock armour walls at both ends of south elevation. There are missing stones at bottom part of embankments (8m$^2$) | Screened In. Instream works required |

## Mitigation Measures

### *Maintenance of slope protection*

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

No concrete, cementitious or fine partial material will be permitted to enter the watercourse. This will be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. One span/culvert structures may not have sufficient capacity accommodate the required working area for a localised diversion. In this instance fluming of the entire waterbody will be carried out in line with Inland Fisheries Ireland, 2016 *Guidelines on protection of fisheries during construction works in and adjacent to water*. The waterbodies will be diverted from upstream to downstream of the works area by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. If over pumping is required, a second pump shall be available on site in case of failure of the primary pump.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Glengarriff Harbour and Woodland SAC.

### 5.8.1.3. Ahane Bridge [CC-N72-004.00]

Ahane Bridge is a double span masonry arch bridge with a concrete slab secondary structure with an overall length of 19.5m. There are spalled concrete parapet walls along the carriageway. The bridge carries the N72 over the Owentaraglin River within the Blackwater River (Cork/Waterford) SAC. Plate 5.4 displays the north elevation.


**Plate 5-4** Ahane Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation, [redacted] crayfish, lamprey, salmon, otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] easures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. Masonry debris to be cleared. (28m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Remove Ivy for Southwest wing wall. (2m$^2$) | Screened out. Vegetation is not QI of the SAC |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Masonry repointing to the south external face of the parapet. (6m$^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Concrete repair to the cracks at the inner face of the north parapet. (0.1m$^2$) | Screened out. Contained to bridge deck |
| Parapets/Safety barrier | Spalling to the external face of the south parapet. (0.3m$^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Concrete repair to cracks at the top of the west wing walls. (5m) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.4. Milleenylegane Culvert [CC-N72-005.00]

Milleenylegane Culvert is a single span concrete slab structure with an overall length of 2.46m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Knocknageeha East Stream. The Blackwater River (Cork/Waterford) SAC is located 7.8km downstream of bridge. Plate 5.5 displays the abutments and wingwalls.

**Plate 5-5** Milleenylegane Culvert.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Minor moss removal from both parapets. ($3m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Removal of vegetation to embankments. 1m wide strip at each side of the structure. ($20m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Moss removal from all wing walls. ($2m^2$) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | Repointing at various locations of both parapets. ($2m^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.5. Cloonbanin Culvert [CC-N72-006.00]

Cloonbanin Culvert is a single span concrete slab structure with an overall length of 2.66m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Skagh Stream. The Blackwater River (Cork/Waterford) SAC is located 5.6km downstream of bridge. Plate 5.6 displays the north elevation.

**Plate 5-6** Cloonbanin Culvert.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation, 1m wide strip to embankments at each side of the structure. (20m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | Repointing to both parapets are various locations at both faces. (3m$^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.6. Drominagh Bridge [CC-N72-007.00]

Drominagh Bridge is a single span masonry arch structure with an overall length of 5.54m. The roadway is lined by masonry parapet walls. The bridge carries the N72 over the Maulyclickeen Stream. The Blackwater River (Cork/Waterford) SAC is located 4km downstream of bridge. Plate 5.7 displays the north elevation.

**Plate 5-7** Drominagh Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Moss removal from the coping of both parapets. ($4m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Vegetation up to 1m strip from the structure to be cut back or removed ($20m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Vegetation removal from all wing walls, mainly at the north side, including ivy. ($20m^2$) | Screened out. Vegetation is not QI of the SAC |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Masonry repointing to both parapets at various locations and to the crack at the coping of the north parapet at the west side. (5m$^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to all wing walls. (15m$^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Masonry repair to the north parapet at the west side and at the north parapet at the mid-span. (0.3m$^3$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Masonry repair to the west wing walls, one block each, including a small masonry block at the coping of the Northeast wing wall. (0.3m$^3$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Crack to the arch barrel at the north arch which should be concrete repaired. (0.4m$^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.7. Leaders Bridge [CC-N72-010.00]

Leaders Bridge is a triple span masonry arch bridge with an overall length of 29m. There are masonry parapet walls along the carriageway. The bridge carries the N72 over the River Allow within the Blackwater River (Cork/Waterford) SAC. Plate 5.8 displays the north elevation.


**Plate 5-8** Leaders Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Vegetation clearance upstream of the west span. (6m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Removal of vegetation, 1m wide strip to southern embankments and north west embankment to provide access. (45m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Piers | Masonry repair to the base of the pier at the upstream end. (1m$^3$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.8. Ketragh Bridge [CC-N72-013.00]

The Ketragh Bridge is a 3-span masonry arch bridge with concrete extension which carries N72 over the River Awbeg. Each span is 2.4m. There is masonry parapets and steel safety barrier on concrete posts. The bridge is within the Blackwater River (Cork/Waterford) SAC. Plate 5-9a shows the arch section at north side and Plate 5-9b shows the concrete slab section at south side.

**Plate 5-9a** Ketragh Bridge.

**Plate 5-9b** Ketragh Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of the watercourse of the west upstream span. ($2m^2$) | Screened In. Instream works required. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| | *Debris to be removed can be seen in Plate 5.5a and comprises an accumulation of branches caught on the cutwater* | |
| Parapets/Safety barrier | Moss removal to the area at the base of the outer face of the parapets. ($3m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Removal of vegetation to embankments. 1m wide strip at each side of the bridge. ($40m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Masonry repointing to the North spandrel wall. ($8m^2$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Masonry repair to the coping of both parapets at various locations. ($0.3m^3$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Masonry repair to the Southwest wing wall. ($0.2m^3$) | Screened In. Use of wet masonry over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.9. Boland's Bridge [CC-N72-014.00]

The Boland's Bridge is a single span masonry arch bridge with in-situ reinforced concrete extension. The original arch barrel has a span of 1.2m. The concrete slab extension has a clear span of 1.258m and measures 2.25m to the barrel of the slab. The bridge is within the Blackwater River (Cork/Waterford) SAC. Plate 5-10 shows the concrete section at north side.

**Plate 5-10** Boland's Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted]However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation to embankments. 1m wide strip at each side of the bridge. ($40m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Reshape the Southeast embankment $6m^3$. ($6m^3$) | Screened In. Instream works required. |
| Parapets/Safety barrier | Concrete spalling repair to the east parapet at the south side and to the south pilaster of the west parapet. ($0.2m^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Maintenance of slope protection*

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

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.10. Firville Culvert [CC-N72-019.00]

The structure is a 2-span masonry structure with masonry parapets. The maximum span is 1.17m and the minimum span is 0.67m. The structure is located 600m upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5-11 shows the north side.

**Plate 5-11** Firville Culvert.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted]However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of watercourse at the east side. ($4m^2$) | Screened In. Instream works required. |
| Parapets/Safety barrier | Remove vegetation from the parapet. ($1m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Removal of vegetation to embankments, $10m^2$ to northern embankment and $30m^2$ of vegetation clearance to south side of the structure. Debris should be cleared from embankments. ($40m^2$) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | Repointing where required and after vegetation removal. ($1m^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

Vegetation debris and waste debris shall only be removed from watercourses by hand. As per the Works Requirements Specification document, no live aquatic vegetation or silt shall be removed from the riverbed. Where there is any doubt the Contractor must seek the advice of their appointed ecologist. Care is to be taken

not to disturb the riverbed when removing debris from the watercourse in order to minimise any disturbance of silt.

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.11. Bridge Street Junction, Mallow [CC-N72-022.00]

Bridge Street Junction, Mallow is a double span masonry arch bridge with secondary concrete slab structure with an overall length of 14m. There are steel parapet railings along the carriageway. The bridge carries the N72 over the South Caherduggan River within the Blackwater River (Cork/Waterford) SAC. Plate 5.12 displays the eastern elevation.


**Plate 5-12** Bridge Street Junction, Mallow**.**

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of downstream east watercourse. (8m$^2$) | Screened In. Instream works required. |
| Wing/Spandrel/Retaining Walls | Vegetation removal from the east wing walls and spandrel walls, mainly ivy. (40m$^2$) | Screened out. Vegetation is not QI of the SAC |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Piers | Ivy and vegetation removal from east pier. (25m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Clearance of transversal drainage at the north side and at the eastbound direction. (8 no.) | Screened out. Works limited to within the deck |
| Wing/Spandrel/Retaining Walls | Repointing after vegetation removal. (20m$^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Piers | Repointing after vegetation removal. (25m$^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.12. Spa Glen Culvert [CC-N72-023.00]

Spa Glen Culvert is a culvert over the South Caherduggan Stream which is accessed through a manhole in the road carriageway of Spa Square. The Blackwater River (Cork/Waterford) SAC is located 1km downstream of culvert. Plate 5.13 displays man hole access to the culvert.

**Plate 5-13** Spa Glen Culvert.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish;

lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of the watercourse of the buried culvert, access from manhole. (30m$^2$) | Screened In. Instream works required. |
| Bridge surface | Clean 4 no. drain gullies. (4 no.) | Screened out. Contained to bridge deck |

### Mitigation Measures

#### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.13. Spa Walk South, Mallow [CC-N72-024.00]

The structure is a 2-span masonry arch bridge with masonry parapets which carries N72 over the South Caherduggan. The maximum span is 2.55m and the minimum span is 2.45m. The rise of arch barrel at crown is 0.84m. The structure is located 1km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5-14 shows the east elevation.

**Plate 5-14** Spa Walk South, Mallow.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of vegetation of the east parapet at the copping and outer face. (4m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Cut back vegetation to maintain 1m clearance around structure, remove trees from southeast embankment (30m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Clean drainage hole under north side of east parapet. (1 no.) | Screened out. Contained to bridge deck |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Repointing after vegetation removal. ($2m^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

### Mitigation Measures

*Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.14. Spa Walk Central, Mallow [CC-N72-025.00]

The structure is a 3.26m single span masonry arch bridge carrying N72 over the South Caherduggan. The passage is a tributary of the River Blackwater. There is steel safety barrier on steel posts and masonry parapets.

There are 2 no. manholes to the south and 3 no. manholes to the north. The structure is located 1.3km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5-15 shows the east elevation.

**Plate 5-15** Spa Walk Central, Mallow.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Vegetation removal from both parapets, mainly moss. ($2m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Vegetation removal from embankments to maintain 1m clearance around structure ($10m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Vegetation removal from both spandrel walls and all wing walls. ($4m^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Clean 1 no. drain gully. (1 no.) | Screened out. Contained to bridge deck |
| Bridge surface | Clear drainage channels at ends of east parapet, clear drainage units along west footway (3 no.) | Screened out. Contained to bridge deck |
| Bridge surface | Clean drain pipe at east side. (1m) | Screened out. Contained to bridge deck |
| Parapets/Safety barrier | Repointing after vegetation removal and at various locations where required. ($2m^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Seal of crack at the outer face of west parapet at the north side. Works over land. ($1m^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Concrete repairs*

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

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

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

Mixing of materials shall be carried out at least 25 metres away from the riverbank on an impermeable surface, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. The worker must also ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall

be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed, and the waste material will be removed off-site and disposed of appropriately at an approved site.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.15. Carrig Bridge [CC-N72-027.00]

Carrig bridge is a single span masonry arch bridge with concrete slab secondary structure with a span of 4.71m. Masonry parapets are present along the roadsides. The bridge carries the N72 across the North Caherduggan River, within the Blackwater River (Cork/Waterford) SAC. Plate 5-16 shows the masonry and concrete slab structure of the bridge.

**Plate 5-16 Carrig Bridge.**

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted]However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

During a specialist bat survey of the structure in 2020, the surrounding area was also surveyed for otter. Otter spraints were recorded on a rock on the downstream side of the structure. Mitigation measures to protect otter in the vicinity of the bridge are outlined below.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Vegetation removal from both parapets and both faces, mainly moss. (10m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Remove vegetation from embankments to maintain 1m clearance around structure. (200m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Vegetation removal from the north wing walls. (25m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Clean 2no. drain gullies. (2 no.) | Screened out. Contained to bridge deck |
| Wing/Spandrel/Retaining Walls | Repointing after vegetation removal wing walls. (10m$^2$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Abutments | Removal of graffiti from the east abutment at the south side. (2m$^2$) | Screened In. Removal of graffiti over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Graffiti Removal*

Graffiti removal is not permitted at this structure as it is located over water within an SAC and shall not be carried out by the Contractor.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.16. Torpys Cross Road Bridge [CC-N73-002.00]

Torpys Cross Road Bridge is a single span masonry arch bridge with a span of 2.3m. Masonry parapets are present along the roadsides. The bridge carries the N73 across an unnamed drain, upstream of the North Caherduggan River, 2.1km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5-17 shows the south elevation of the bridge.


**Plate 5-17** Torpys Cross Road Bridge**.**

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

During a specialist bat survey of the structure in 2020, the surrounding area was surveyed for otter. However, no signs of otter were recorded.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Vegetation removal from the inner face and the coping of the south parapet. (5m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Removal of vegetation from embankments along wing walls, maintain 1m clearance around structure (40m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Vegetation removal from the South spandrel wall and wing walls. (10m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Deck/slab/arch barrel | Masonry repair to the key stone of the South arch. (0.2m$^3$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Embankments/Revetments | Reshaping of the Northwest embankment 3m$^3$. (3m$^3$) | Screened In. Instream works required. |

## Mitigation Measures

### *Masonry Repointing*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Maintenance of slope protection*

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

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.17. Ballygown Pipe Culvert [CC-N73-003.00]

Ballygown Pipe Culvert is a 5 span concrete pipe culvert with a span width of 4.4m. Concrete parapet walls are present along the roadsides. The bridge carries the N73 across Monanimy Lower Stream, 2.4km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5-18 shows the pipes.

**Plate 5-18** Ballygown Pipe Culvert.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation to be cut back or removed from 1m strip on embankments adjacent to structure including the removal of Ivy. ($15m^2$) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | Mortar repair at various locations of the inner face of both parapets. ($3m^3$) | Screened out. Contained to bridge deck |
| Embankments/Revetments | Reshaping of the Northwest embankment $2m^3$. ($2m^3$) | Screened In. Instream works required. |
| Parapets/Safety barrier | Seal the crack at the inner face of the south parapet. ($1m^2$) | Screened out. Contained to bridge deck |

## Mitigation Measures

### *Maintenance of slope protection*

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

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

## Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

### 5.8.1.18. Ballynamona Bridge [CC-N73-005.00]

The Ballynamona Bridge is a 3-span masonry arch bridge with masonry parapets which carries N73 over the River Awbeg. The maximum span is 5.62m and the minimum span is 4.04m. There is pumphouse for main water supply built on southeast corner of the bridge. The structure is within Blackwater River (Cork/Waterford) SAC. Plate 5-19 shows the east elevation.

**Plate 5-19 Ballynamona Bridge.**

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon; otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Vegetation removal from parapets (20m$^2$) | Screened In. Instream works likely required to install scaffolding. |

#### Mitigation Measures

##### *Vegetation removal*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. This includes a search of the embankments for otter holts. If a holt is present on the river bank, scaffolding cannot be erected, and an underbridge unit should instead be used from the bridge deck. Strict application of biosecurity measures must also be applied to any work platforms used instream.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

## 5.8.2. Clare

### 5.8.2.1. Burrane Bridge [CL-N67-001.00]

The Burrane Bridge is a 2-span bridge comprised by corrugated steel arch on the south side and masonry arch on the north side. The span is 3.1m each and rise of arch barrel at crown is 1.34m. There is steel safety barrier on the south side and steel parapet on the north side. The structure is within the Lower River Shannon SAC and is located 80m upstream of the River Fergus Estuaries SPA. Plate 5-20 shows the north elevation.

**Plate 5-20** Burrane Bridge.

The qualifying interests of Lower River Shannon SAC and River Fergus Estuaries SPA are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; estuaries; mudflats; large shallow inlets and bays; reefs; wetland SCIs of SPA. The potential impacts to the SAC and SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour repairs to north east retaining wall located adjacent to north east embankment. Masonry wall has partially collapsed hence masonry repairs are required. At least 1m$^3$ of masonry repairs are needed (1m$^2$) | Screened In. Instream works required. |
| Embankments/Revetments | Vegetation clearance from south embankment to expose south elevation, vegetation clearance from north embankments to maintain 1m clearance around. Removal of fly tipping material from north east embankment (100m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Bridge surface | Cleaning of blocked north-west drainage gully. (1 no.) | Screened out. Contained to bridge deck |
| Wing/Spandrel/Retaining Walls | Masonry repointing to north west wing wall below gully outlet and other localised areas. Water from the gully may be | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| | washed out the mortar at this location. (10m$^2$) | |
| Wing/Spandrel/Retaining Walls | Masonry repairs to some localised areas to north east and north west wing walls and spandrel walls (0.2m$^3$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing and Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lower River Shannon SAC and River Fergus Estuaries SPA.

### 5.8.2.2. Potter's Wheel Bridge [CL-N67-013.00]

Potter's Wheel Bridge is a single span concrete slab structure with a total span width of 2.85m. The bridge carries the N67 over an unnamed stream which appears to ultimately drains to Doonbeg Bay. Carrowmore Dunes SAC and Mid-Clare Coast SPA are located approximately 1km downstream of the bridge. Plate 5.21 displays the north elevation of the structure.

**Plate 5-21** Potter's Wheel Bridge.

The qualifying interests of Carrowmore Dunes SAC and Mid-Clare Coast SPA are listed in Section 5.2. The qualifying interests that could be impacted are reefs and wetland SCIs of SPA. The potential impacts to the SAC

and SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour hole at the end of south east rock armour wall. There is a scour hole to be filled. 0.4m high x 0.5m long x 0.3m wide ($0.1m^2$) | Screened In. Instream works required. |
| Embankments/Revetments | Clearance of 1m strip of vegetation from structure on south side. ($12m^2$) | Screened out. Vegetation is not QI of the SAC |
| Abutments | Masonry repairs to west abutment at clapper structure adjacent to N67 road culvert. It seems to be a collapse to the abutment wall at the beginning of west abutment ($1m^3$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

#### *Masonry Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

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

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Carrowmore Dunes SAC and Mid-Clare Coast SPA.

### 5.8.2.3. Liscasey Bridge West [CL-N68-004.00]

The Liscasey Bridge is a 2-span stone masonry arch bridge. The span lengths are 1.34m and 1.62m. The substructure consists of 2 masonry abutments and a masonry pier. There are masonry parapets on both sides of the carriageway. The structure is located 10.8km upstream of Lower River Shannon SAC and located 10.8km upstream of River Shannon and Fergus Estuaries SPA. Plate 5-22 shows the south elevation.

**Plate 5-22 Liscasey Bridge West.**

The qualifying interests of Lower River Shannon SAC and River Shannon and Fergus Estuaries SPA are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; estuaries; mudflats; large shallow inlets and bays; reefs; wetland SCIs of SPA. The potential impacts to the SAC and SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour hole at north west masonry retaining wall to be repaired ($2m^2$) | Screened In. Instream works required. |
| Embankments/Revetments | Clearance of 1m strip of vegetation growth away from structure on all embankments. ($15m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Masonry repairs to north east wing wall. There is a damaged concrete drainage outlet pipe at top of the masonry wall to be repaired.<br>Concrete pipe to be replaced for a new one and masonry repairs to wall. ($0.5m^3$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lower River Shannon SAC and River Shannon and Fergus Estuaries SPA.

## 5.8.3. Kerry

### 5.8.3.1. Brewsterfield Bridge [KY-N22-023.00]

The Brewsterfield Bridge is a 61.3m triple span concrete slab structure which carries the N22 over the River Flesk in Co. Kerry. Steel parapet railings line the carriageway. The bridge is located within Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC and 13.5km upstream of Killarney National Park SPA. Plate 5.23 displays the northern elevation.


**Plate 5-23** Brewsterfield Bridge.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and Killarney National Park SPA are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; Kerry slug; [redacted] lamprey; salmon; otter and Killarney fern. The potential impacts to the SAC are the physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

#### Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | 5m2 debris clearance needed at the upstream elevation. (5m$^2$) | Screened In. Instream works required. |
| Embankments/Revetments | Removal of vegetation to all embankments at top and bottom of the wing walls. 1m wide strip to provide access. (80m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Moss removal from the wing walls. (10m$^2$) | Screened out. Vegetation is not QI of the SAC |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Bridge surface | Cleaning required at 4 no. corners of the structure to unblock drainage and prevent water ponding. (4 no.) | Screened out. Works limited to deck |
| Abutments | Clear bearing shelf drainage at both abutments. (30m) | Screened out. Works over land |

### Mitigation Measures

*Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and Killarney National Park SPA.

## 5.8.3.2. Poulgorm Bridge [KY-N22-027.00]

The Poulgorm Bridge is a 23.90m single span concrete bridge which carries the N22 over the River Flesk in Co. Kerry. The parapets comprise heavy steel rails over the deck with a masonry parapet at top of the wing walls. The bridge is within the Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC. Plate 5-24 shows the south elevation.

**Plate 5-24** Poulgorm Bridge.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; Kerry slug; [redacted] lamprey; salmon; otter and Killarney fern. The potential impacts to the SAC are the loss or modification of habit physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of light vegetation from the parapets. ($1m^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments with additional vegetation clearance required at the SW wing wall. ($80m^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Removal of minor vegetation growth from the northeast wing wall ($1m^2$) | Screened out. Vegetation is not QI of the SAC |
| Abutments | Clear bearing shelf drainage on both abutments. (40m) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | $1m^3$ masonry repair required to the end of the SW masonry parapet and the safety barrier connection reinstated. ($1m^3$) | Screened In. Use of wet mortar over water and therefore a surface water pathway is present. |
| Abutments | $1m^2$ concrete repair required to the area of spalling on the face of the west abutment, immediately below the walkway ledge. ($1m^2$) | Screened In. Use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Concrete repairs*

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

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

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

Mixing of materials shall be carried out at least 25 metres away from the riverbank on an impermeable surface, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. The worker must also ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall

be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed, and the waste material will be removed off-site and disposed of appropriately at an approved site.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC.

### 5.8.3.3. Cummeenavrick Culvert #1 [KY-N22-030.00]

The Cummeenavrick Culvert #1 is a 1.76m-wide single span concrete pipe culvert which carries the N22 over the Ford Currimeenavrick Stream. Steel safety barriers line the carriageway. The bridge is located 1.2km upstream of the Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and over 30km upstream of the Killarney National Park SPA. Plate 5.25 displays the south elevation.


**Plate 5-25** Cummeenavrick Culvert #1.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and Killarney National Park SPA are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; Kerry slug; [redacted] lamprey; salmon; otter and Killarney fern. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted]

[redacted] Measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Removal of debris from both ends of the pipe culvert. (10m$^2$) | Screened In. Instream works required |
| Riverbed | Erosion and undermining to the concrete apron at south elevation of the structure. Concrete repairs required. (5m$^2$) | Screened In. Instream works required |
| Embankments/Revetments | Maintenance of vegetation, 1m wide strip, to embankments at each side of the structure and behind wing walls-head walls at both sides of the culvert. Removal of 2no. large trees growing above both ends of culvert. (48m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Moss removal from the wing walls and head walls at both elevations (15m$^2$) | Screened out. Vegetation is not QI of the SAC |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC and Killarney National Park SPA.

### 5.8.3.4. Cummeenavrick Culvert #2 [KY-N22-031.00]

The Cummeenavrick Culvert #2 is a single span pipe culvert with a total span width of 5.5m which carries the N22 over the Ford Currimeenavrick Stream in Co. Kerry. Timber fencing and steel safety barriers are located above the culvert and along the roadway. The Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC is located 1.4km downstream of the culvert, while the Killarney National Park SPA is over 30km downstream. Plate 5-26 shows the south elevation.


**Plate 5-26** Cummeenavrick Culvert #2.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; Kerry slug; [redacted] lamprey; salmon; otter and Killarney fern. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted] However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation, 1m wide strip to embankments at each side of the structure and behind wing walls-head walls. (60m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Removal of moss growth from wing and head walls (5m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Embankments/Revetments | South end of pipe culvert exposed at south embankment due to missing fill. Suitable fill to be imported and south embankment regraded to cover pipe culvert. (10m$^3$) | Screened In. Instream works required |

## Mitigation Measures

### *Maintenance of slope protection*

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

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River catchment SAC.

### 5.8.3.5. Knocknacaska Culvert [KY-N69-004.00]

Knocknacaska Culvert is a double span concrete slab structure with an overall span width of 2.5m. Timber fencing lines the road above the culvert. The culvert carries the Knocknacaska Stream below the N69. The Lower River Shannon SAC is located approximately 10.6km downstream of the culvert. Plate 5.27 displays the west elevation.


**Plate 5-27** Knocknacaska Culvert.

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

## Proposed Works

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

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

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Rock armour to be placed in downstream riverbed where scour hole is forming under the pipe outlet. ($3m^2$) | Screened In. Instream works required |
| Embankments/Revetments | Vegetation clearance from embankments around both portals ($50m^2$) | Screened out. Vegetation is not QI of the SAC |
| Piers | Masonry repair to upstream pier which has partially collapsed. ($1m^3$) | Screened In. Instream works required |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the

discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.6. Knocknacaska Arch [KY-N69-005.00]

Knocknacaska Arch is a single span masonry arch bridge with concrete slab sub-structure with an overall span width of 8.3m. Masonry walls line the road above the bridge. The bridge carries the Farran Stream below the N69. The Lower River Shannon SAC is located approximately 10.2km downstream of the bridge. Plate 5.28 displays the west elevation.


**Plate 5-28** Knocknacaska Arch**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-39 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-39 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/ Revetments | Vegetation clearance from east embankments to maintain 1m clearance around structure (20m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Wing/Spandrel/Retaining Walls | Remove light vegetation growth from wingwalls at upstream end (4m$^2$) | Screened out. Vegetation is not QI of the SAC |
| Parapets/Safety barrier | Repointing to outside face of east parapet. (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Wing/Spandrel/Retaining Walls | Marines repointing to spandrel walls at downstream end and upstream wingwalls ($10m^2$) | Screened out. Repointing over land |
| Deck/slab/arch barrel | Masonry repointing to open joints in arch barrel where water seepage is evident ($8m^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repairs*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

## Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.7. Knockbrack Culvert [KY-N69-006.00]

Knockbrack Culvert is a single span concrete slab structure with an overall span width of 3m. There are no parapets or safety barriers associated with this structure. The culvert carries the Fahavane Stream below the N69. The Lower River Shannon SAC is located approximately 10.3km downstream of the culvert. Plate 5.29 displays the west elevation.


**Plate 5-29** Knockbrack Culvert**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-40 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-40 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Concrete scour repair to hole forming in invert at west end just downstream of the structure ($2m^2$) | Screened in. Instream works required |
| Embankments/ Revetments | Vegetation clearance from embankments to maintain clearance around both portals. ($200m^2$) | Screened out. Vegetation is not QI of the SAC |

#### Mitigation Measures

##### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.8. Mountcoat Cross Pipe Culvert [KY-N69-013.00]

The Mountcoat Cross Pipe Culvert is a 2-span precast reinforced concrete piped culvert. The span lengths are 0.93m each. There are no masonry parapets on both sides of the carriageway. The structure is located 4.7km upstream of the Lower River Shannon SAC. Plate 2-30 shows the west elevation.

**Plate 2-30** Mountcoat Cross Pipe Culvert.

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-41 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-41 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Remove light branches caught at upstream end (10m$^2$) | Screened out. Vegetation is not QI of the SAC. Work will be conducted by hand |
| Riverbed | Concrete scour repairs to undermined pipes at the outlet. (4m$^2$) | Screened in. Instream works required |
| Embankments/Revetments | Vegetation clearance at both sides to the carriageway behind safety barriers down to inlet and outlet (250m$^2$) | Screened out. Vegetation is not QI of the SAC. |

### Mitigation Measures

#### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.9. Skehanierin Culvert [KY-N69-018.00]

The Skehanierin Culvert is a 3.31m-wide double span concrete slab and pipe culvert which carries the N69 over the Skehanierin River. Masonry parapet walls line the carriageway. The culvert is located 1km upstream of Lower River Shannon SAC. Plate 5.31 displays the east elevation.

**Plate 5-31** Skehanierin Culvert**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries and mudflats. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted]However, measures to protect water quality will be adopted which will ensure negative impacts on the species are avoided.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-42 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-42 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Remove light branches caught at inlet ($3m^2$) | Screened out. Works to be done by hand and small in scale. |
| Riverbed | Concrete scour protection required under undermined pipe outlet at upstream side and also at the downstream end where the pipes are undermined at the outlet. ($3m^2$) | Screened in – instream works required. |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. ($20m^2$) | Screened out. Vegetation is not QI of the SAC. Work will be conducted by hand |
| Bridge surface | Soft cut in verge to allow water to drain from in front of rubbing strip (1 no.) | Screened out. Works restricted to the deck |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.10. Cloontubbrid South Culvert [KY-N69-019.00]

Cloontubbrid South Culvert is a double span pipe culvert with masonry arch sub-structure. The culvert has an overall span width of 2.7m and carries the N69 over the Cloonmackon stream. There is a concrete post and rail fence on the eastern side and the west has no safety barrier or parapet wall. The Lower River Shannon SAC is approximately 3.9km downstream of the bridge. Plate 5-32 shows the west elevation.


**Plate 5-32** Cloontubbrid South Culvert**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-43 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-43 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation clearance from embankments around both elevations (25m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Abutments | Remove light vegetation growth from both abutments (10m$^2$) | Screened out. Vegetation is not QI of the SAC. Work will be conducted by hand |
| Bridge surface | Clear out gully on east side of carriageway. (1 no.) | Screened out. Works restricted to the deck |
| Bridge surface | Clear drain gully on east verge. (1 no.) | Screened out. Works restricted to the deck |
| Abutments | Repointing to open joints throughout (10m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Repoint open joints throughout deck (18m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Masonry repair to bulging stonework to arch barrel, repair to constitute repointing using pinning stones (1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

## 5.8.3.11. Cuss North Culvert [KY-N69-022.00]

The Cuss North Culvert is a single span stone masonry arch culvert. The span is 2m. The substructure consists of 2 masonry and concrete abutments. There are masonry parapets on both sides of the carriageway. The structure is located 1.5km upstream of the Lower River Shannon SAC. Plate 5-33 shows the east elevation.

**Plate 5-33** Cuss North Culvert**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-44 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-44 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation clearance from the embankments to maintain 1m clearance around structure (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to localised open joints (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Concrete repair to concrete deck where spalling is evident (2m$^2$) | Screened out. Works restricted to the deck |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.12. Tarmon East Cross Roads [KY-N69-024.00]

Tarmon East Cross Roads is triple span pipe culvert with concrete slab sub-structure. The overall span width is 5m. Masonry walls line the road above the culvert. The structure carries the N69 over the Tyshe River 6.6km upstream of the Lower River Shannon SAC. Plate 5.34 shows the west elevation.

**Plate 5-34** Tarmon East Cross Roads**.**

The qualifying interests of The Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; dolphin; floating river vegetation; estuaries; mudflats; large shallow inlets and bays and reefs. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-45 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-45 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour repairs to undermining of pipes at outlet and inlet. (6m$^2$) | Screened in. Instream works required. |
| Embankments/Revetments | Cut back excess vegetation growth from all embankments. (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Abutments | Removal of vegetation growth at interface between pipes and east slab (4m$^2$) | Screened out. Vegetation is not QI of the SAC. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Wing/Spandrel/Retaining Walls | Masonry repair to damaged/displace wingwall at the NE corner ($2m^3$) ($2\ m^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.3.13. Curraheen Bridge [KY-N70-016.00]

The Curraheen Bridge is a single span arch bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 3.65m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 400m upstream of the Castlemaine Harbour SAC and located 300m upstream of the Castlemaine Harbour SPA. Plate 5-35 shows the north elevation.


**Plate 5-35** Curraheen Bridge.

The qualifying interests of The Castlemaine Harbour SAC and SPA are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; estuaries and mudflats. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-46 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-46 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation required from embankments within 1m of bridge structure. Any waste / debris to be removed. (20m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of light vegetation growth to both spandrel walls (8m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Deck/slab/arch barrel | Localised minor open joints to be repointed (3m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Castlemaine Harbour SAC and SPA.

### 5.8.3.14. Cummergorm Bridge [KY-N70-020.00]

The Cummergorm Bridge is a 6m-wide triple span concrete slab bridge which carries the N70 over the Curra River. Concrete parapet walls line the carriageway. Castlemaine Harbour SAC and SPA are located 2.8km downstream of the bridge. Plate 5.36 displays the east elevation.


**Plate 5-36** Cummergorm Bridge.

The qualifying interests of Castlemaine Harbour SAC and SPA are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; estuaries and mudflats. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-47 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-47 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of debris gathered at upstream end of structure and caught under the structure (12m$^2$) | Screened in – Instream access required. |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. Overhanging trees on SW embankment to be removed. (8m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of light vegetation and moss from outside faces of structure (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Wing/Spandrel/Retaining Walls | Localised repointing to open joints on both sides of the structure (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Localised concrete repairs to slab where spalling is evident (2m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Castlemaine Harbour SAC and SPA.

### 5.8.3.15. Loher Bridge [KY-N70-040.40]

Loher bridge is a single span masonry arch with a span width of 2.5m. Masonry parapet walls line the road. The bridge carries the N70 across an unnamed river 1.3km upstream of Ballinskelligs Bay and Inny Estuary SAC. The bridge is located on the downstream boundary of the Killarney National Park, Macgillycuddy's Reeks and

Caragh River Catchment SAC. Plate 5.37a displays the masonry arch of the bridge, while Plate 5.37b displays the view downstream.

**Plate 5-37a** Loher Bridge.

**Plate 5-37b** Loher Bridge.

The qualifying interests of Ballinskelligs Bay and Inny Estuary SAC and Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC are listed in Section 5.2. The qualifying interests that could be impacted are lamprey; salmon; otter; Killarney Fern and salt meadows. The potential impacts to the SACs are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-48 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-48 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Devegetate rock/stone face of waterfall, undertake masonry repairs and repointing throughout (20m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Remove soil and grass growth to parapets over the structure on both sides of the carriageway (15m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Cut back all embankments including hedging to 4m downstream of structure (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Remove vegetation from all wingwalls and approach walls at both sides of the structure (45m$^2$) | Screened in – Pre-construction survey for Killarney fern (QI) required. |
| Abutments | Removal of moss and algae to both abutments throughout the structure (14m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Clean 2no. gully pots out at adjacent drive. Clear drainage opening in parapet (3 no.) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repointing following vegetation removal (25m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Abutments | Masonry repointing to both abutments following veg removal (8m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Remove moss and algae staining throughout, rake out joints and fully repoint (20m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Embankments/Revetments | Installation of rock armour at downstream end of structure, beyond water fall where adjacent embankment is undercut. Rock armour to be extended under waterfall in scour hole to prevent further deterioration (6m$^3$) | Screened in – instream works required. |

## Mitigation Measures

### *Removal of Vegetation*

The Contractor's ecologist shall carry out a survey of this structure for Killarney fern, including gametophyte colonies. If Killarney fern is not recorded, the proposed works can proceed. If Killarney fern is recorded, the ecologist shall identify these areas. The proposed vegetation removal shall not be carried out in these identified areas.

### *Masonry Repointing and Repair*

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

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Maintenance of slope protection*

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

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

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

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

The Contractor must notify Inland Fisheries Ireland prior to the commencement of the proposed instream works and the associated measures outlined above must be implemented. The Contractor's ecologist will advise on whether electrofishing to remove fish from between the upstream and downstream sandbags is required. IFI issue licences for electrofishing. Where dewatering activities occur, instream silts should not be disturbed or removed from the river channel. If disturbance and/or removal of silts is required to access a bridge component, the silts shall be surveyed for the presence of lamprey ammocoetes. If lamprey ammocoetes are found, they

shall be translocated to suitable receptor habitats. Receptor habitats shall be selected prior to lamprey removal from the silts or electrofishing. All surveying and electrofishing activities of lamprey and salmonids shall be carried out under licence from IFI.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Ballinskelligs Bay and Inny Estuary SAC and Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC.

### 5.8.3.16. Lomanagh South Bridge [KY-N70-050.00]

The Lomanagh South Bridge is a double span masonry arch bridge with an overall length of 17.87m. Masonry parapet walls line the carriageway. The bridge carries the N70 over the Owreagh River 750m upstream of Kenmare River SAC. Plate 5.38 displays the north elevation.


**Plate 5-38** Lomanagh South Bridge.

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

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-49 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-49 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | All trees, bushes and deep rooted vegetation within 1m of structure to be removed (20m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Minor vegetation and moss growth to be removed from the wingwalls (5m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Localised masonry repair to areas of missing stonework to the road face of the parapet (1m$^3$) | Screened out. Works limited to the deck. |
| Piers | Masonry repair to piers between rock outcrop and base of masonry pier (1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

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

### 5.8.3.17. Derreenamacken Bridge [KY-N70-052.60]

The Derreenamacken Bridge is a single span stone masonry arch bridge with two stone culverts just west of the arch. The span is 3.04m. The substructure consists of 2 masonry abutments. There are no parapets on the structure. The structure is located 150m upstream of the Kenmare River SAC. Plate 5-39 shows the north elevation.

**Plate 5-39** Derreenamacken Bridge.

The qualifying interests of Kenmare River SAC are listed in Section 5.2. The qualifying interests that could be impacted are Large shallow inlets and bays, reefs, otter, harbour seal, lesser horseshoe bat. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

Derreenamacken Bridge was surveyed twice in 2020. On the first occasion a single Lesser horseshoe bat was recorded roosting under one of the stone culverts. This survey was followed up with a bat detector survey. Dereenamacken Bridge and surrounding watercourse are important foraging areas for Lesser Horseshoe bats. On 18/05/21 no bats were recorded roosting in the structure but a few bat droppings (most likely Lesser Horseshoe bat) were recorded on the floor of both culverts. A total of 7 crevices have been marked for retention under arch.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-50 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-50 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | All trees, bushes and deep rooted vegetation within 1m of structure to be removed. Collapsed tree to be removed. ($6m^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to wingwall between the clapper beam and main arch span. ($15m^2$) | Screened in – signs of lesser horseshoe bat (QI) recorded. |
| Abutments | Masonry repointing to the clapper beam abutments throughout ($10m^2$) | Screened in – signs of lesser horseshoe bat (QI) recorded. |
| Piers | Masonry repointing to the clapper beam abutments throughout ($28m^2$) | Screened in – signs of lesser horseshoe bat (QI) recorded. |
| Abutments | Masonry repair to partial collapse to clapper beam structure to the west of the main arch. ($3m^3$) | Screened in – signs of lesser horseshoe bat (QI) recorded. |

### Mitigation Measures

#### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

**Bridge specific measure:** A derogation licence must be sought for permission to conduct masonry works to clapper beam structure, due to presence of lesser horseshoe bat roost.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Kenmare River SAC. However, as noted a Derogation licence must be applied for from NPWS (Department of Housing, Local Government and Heritage).

## 5.8.3.18. McCarthy & O'Leary Memorial Bridge [KY-N71-001.00]

The McCarthy & O'Leary Memorial Bridge is a triple span concrete bridge with an overall length of 77.15m. Steel parapet railings line the carriageway. The bridge carries the N71 over the River Flesk within Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC and 2km upstream of Killarney National Park SPA. Plate 5.40 displays the face of the structure.


**Plate 5-40** McCarthy & O'Leary Memorial Bridge.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA are listed in Section 5.2. The ualif ing interests that could be impacted are oligotrophic waters; floating river vegetation; [redacted] lamprey; salmon; otter; lesser horseshoe bat; slender naiad; Killarney fern; and Greenland white fronted goose. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

[redacted]

## Proposed Works

The proposed works at this bridge are detailed in Table 5-51 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-51 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of tree branches caught on piers (20m$^2$) | Screened in – instream works required. |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Rodding of vegetation from kerb drainage (120m) | Screened out. Works limited to bridge deck. |
| Abutments | Clean bearing shelves of debris and vegetation (25m) | Screened out. Works limited to bridge deck. |
| Abutments | Graffiti overpainting to both abutments (8m$^2$) | Screened in – use of wet paint over water and therefore a surface water pathway is present. |

### Mitigation Measures

*Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

[redacted]

*Graffiti Removal*

Graffiti removal is not permitted at this structure as it is located over water within an SAC and shall not be carried out by the Contractor.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA.

## 5.8.3.19. Muckross Friary Bridge [KY-N71-002.00]

The Muckross Friary Bridge is a 3.6m single span in-situ reinforced concrete bridge with masonry parapets on both sides of the carriageway. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 5-41 shows the west elevation.

**Plate 5-41** Muckross Friary Bridge.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA are listed in Section 5.2. The qualifying interests that could be impacted are oligotrophic waters; floating river vegetation; lamprey; salmon; otter; lesser horseshoe bat; slender naiad; Killarney fern; Greenland white-fronted goose. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-52 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-52 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of trapped debris and vegetation at upstream and downstream ends of structure (10m$^2$) | Screened in – instream works required. |
| Parapets/Safety barrier | Remove light vegetation growth from road side face of parapets (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | All trees, bushes and deep rooted vegetation within 1m of structure to be removed (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Remove light vegetation growth from wingwalls located over embankments (6m$^2$) | Screened in - Pre-construction survey for Killarney fern (QI) required. |
| Bridge surface | All debris, silt and vegetation to be removed from bridge drainage gullies (2 no.) | Screened out. Works to be conducted within deck. |
| Parapets/Safety barrier | Minor concrete repairs to cracking evident on parapet capping. (3m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Removal of Vegetation*

The Contractor's ecologist shall carry out a survey of this structure for Killarney fern, including gametophyte colonies. If Killarney fern is not recorded, the proposed works can proceed. If Killarney fern is recorded, the ecologist shall identify these areas. The proposed vegetation removal shall not be carried out in these identified areas.

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Pre-construction Otter survey*

A pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site.

In accordance with the NRA guidelines, the following guidelines shall be followed:

- No physical damage or disturbance to an otter holt shall occur;
- No works shall be undertaken within 150m of any holt at which breeding females or cubs are present;
- No wheeled or tracked vehicles should be used within 20m of an active non-breeding holt.

If an otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA.

### 5.8.3.20. Torc New Bridge [KY-N71-003.00]

The Torc New Bridge is a 2-span masonry arch bridge with masonry parapets on both sides of the carriageway. The main span is 7.87m and the side span is 2m. The riverbed is uneven but good flow is being maintained. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 5-42 shows the east elevation.

**Plate 5-42** Torc New Bridge.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA are listed in Section 5.2. The qualifying interests that could be impacted are oligotrophic waters; floating river vegetation; lamprey; salmon; otter; lesser horseshoe bat; slender naiad; Killarney fern and Greenland white-fronted goose. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-53 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-53 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour repairs to damaged apron at downstream end ($8m^2$) | Screened in – instream works required. |
| Embankments/Revetments | All trees, bushes and deep rooted vegetation within 1m of structure to be removed ($15m^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | All debris, silt and vegetation to be removed from bridge drainage gullies (2 no.) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Repair to scoured embankments at downstream ends by reinstating rock armour. ($8m^3$) | Screened in – instream works required. |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Maintenance of slope protection*

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

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Pre-construction Otter survey*

A pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site.

In accordance with the NRA guidelines, the following guidelines shall be followed: -

- No physical damage or disturbance to an otter holt shall occur;
- No works shall be undertaken within 150m of any holt at which breeding females or cubs are present;
- No wheeled or tracked vehicles should be used within 20m of an active non-breeding holt.

If an otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA.

### 5.8.3.21. Newfoundland Bay Tunnel [KY-N71-005.00]

The Newfoundland Bay Bridge is a rock tunnel. The span is 4.5m. The structure is within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA. Plate 5-43 shows the east elevation.

**Plate 5-43** Newfoundland Bay Tunnel.

The qualifying interests of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA are listed in Section 5.2. The qualifying interests that could be impacted are lesser horseshoe bat; slender naiad and Killarney fern. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species and reduction in species density.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-54 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-54 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Minor vegetation within 1m of structure to be removed, 100m$^2$. (100m$^2$) | Screened in – Pre-construction survey for Killarney fern (QI) required. |

### Mitigation Measures

#### *Removal of vegetation*

The Contractor's ecologist shall carry out a survey of this structure for Killarney fern, including gametophyte colonies. If Killarney fern is not recorded, the proposed works can proceed. If Killarney fern is recorded, the ecologist shall identify these areas. The proposed vegetation removal shall not be carried out in these identified areas.

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

As per the requirements of the Contract, if the Contractor encounters invasive plant species such as Japanese Knotweed or any other invasive species, they should cordon off the affected area and erect signage indicating the presence of the particular invasive species. No vegetation clearance works should be carried out in the affected area. Biosecurity protocols are outlined in Section 2.1.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Killarney National Park SPA.

## 5.8.3.22. River Gweestin Bridge [KY-N72-002.00]

The River Gweestin Bridge is a 3-span masonry arch bridge with masonry parapets on both sides of the carriageway. The maximum span is 3.8m and the minimum span is 3.5m. The riverbed is uneven, and the river is fast flowing. The structure is within the Castlemaine Harbour SAC. Plate 5-44 shows the north elevation.

**Plate 5-44** River Gweestin Bridge.

The qualifying interests of Castlemaine Harbour SAC are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; lamprey; otter and salmon. The potential impacts to the SAC are the

loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-55 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-55 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of light vegetation from masonry parapet walls. (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Removal of vegetation, including trees, to embankments. 1m wide strip at each side of the bridge. (20m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Masonry repointing to an area of the outside face of the north parapet. (5m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Minor repointing to the arch barrels (5m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Removal of tree stumps from the spandrel walls and undertaking of masonry repairs. (3m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Castlemaine Harbour SAC.

### 5.8.3.23. Ballymalis Bridge [KY-N72-003.00]

The Ballymalis Bridge is a 5.20m single span masonry arch bridge with masonry parapets on both sides of the carriageway. The rise of arch barrel at crown is 0.85m. The structure carries N72 over the stream at Gortnaskarry, a tributary of the River Laune is. The structure is within the Castlemaine Harbour SAC. Plate 5-45 shows the north elevation.

**Plate 5-45** Ballymalis Bridge**.**

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

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-56 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-56 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation to the embankments. 1m wide strip to provide | Screened out. Vegetation is not QI of the SAC. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| | access. Includes removal of the tree at the NE wing wall (20m$^2$) | |
| Wing/Spandrel/Retaining Walls | 1m$^3$ masonry repair to the NE wing wall following the tree removal. (1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

## Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Castlemaine Harbour SAC.

### 5.8.3.24. Cullavaw Bridge [KY-N72-012.00]

Cullavaw Bridge is a double span masonry arch bridge with an overall span width of 8.8m. Masonry parapet walls line the road. The bridge carries the N72 over the Cullavaw Stream, 1.5km upstream of the Blackwater River (Cork/Waterford) SAC. Plate 5.46 displays the south elevation.


**Plate 5-46** Cullavaw Bridge.

The qualifying interests of Blackwater River (Cork/Waterford SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] white-clawed crayfish; lamprey; salmon and otter. The potential impacts to the SAC are the oss or modification of habitat, reduction in species density and deterioration of surface water quality.

[redacted]

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-57 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-57 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation to embankments. 1m wide strip to provide access. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Abutments | Minor masonry repointing to the abutments (1m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Piers | Minor repointing to the pier faces (1m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Minor repointing to the arch barrels (2m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | 1m$^3$ masonry repair to the SW wing wall and head wall (1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC.

## 5.8.3.25. Annagh East Bridge [KY-N86-007.00]

The Annagh East Bridge is a 4.4m single span masonry arch bridge with reinforced concrete arch extension to the south end. The structure carries N86 over the Stream Annagh 23 which is a tributary of the River Lee. There is a metal gate attached to the downstream of the bridge. The structure is within the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA. Plate 5-47 shows the north elevation.

**Plate 5-47** Annagh East Bridge.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-58 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-58 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Scour hole at south east end of span to be repaired. (1.5m$^2$) | Screened in – Instream works required |
| Embankments/Revetments | Removal of vegetation required on all embankments within 1m of bridge structure (24m$^2$) | Screened out. Vegetation is not QI of the SAC. |

## Mitigation Measures

### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.26. Annagh Glen Bridge [KY-N86-009.00]

The Annagh Glen Bridge is a single span reinforced concrete slab bridge. The span is 2.42m. The substructure consists of 2 reinforced concrete abutments. There are concrete parapets on both sides of the carriageway. The structure is located 430m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 100m upstream of the Tralee Bay Complex SPA. Plate 5-48 shows the north elevation.

**Plate 5-48** Annagh Glen Bridge.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-59 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-59 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Concrete repair to collapsed, undermined apron at downstream end and repair to scour holes to apron under the structure. Rock armour to be placed downstream of repaired invert to prevent reoccurrence. | Screened in – Instream works required. |
| Embankments/Revetments | Removal of vegetation required from all embankments within 1m of bridge structure (15m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Removal of debris and silt deposits from drainage gullies (1 at centre of south parapet and 1 at centre north parapet) (2 no.) | Screened out. Works to be conducted within the deck. |
| Deck/slab/arch barrel | Concrete repair to centre of deck (2m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.27. Derryquay East Bridge [KY-N86-012.00]

The Derryquay East Bridge is a single span bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete slab. The span is 2.85m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 300m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 5-49 shows the north elevation.

**Plate 5-49** Derryquay East Bridge.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-60 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-60 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation required on all embankments within 1m of bridge structure (15m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Deck/slab/arch barrel | Spalling of concrete at south east end of reinforced concrete slab. (0.2m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Establish the base of north east wing wall. There is 0.5m$^3$ of base to be repaired. WW base may have been undermined by the force of the watercourse. (0.5m) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Maintenance of base protection*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at

an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

For bridges with more than 1 span, the base protection will be constructed 1 span at a time where feasible, leaving the other span(s) open for watercourse flow thus avoiding any adverse effect to river/fish passage.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.28. Derryquay School West Culvert [KY-N86-013.00]

The Derryquay School West Culvert is a single span bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete slab. The span is 2.45m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 270m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 5-50 shows the south elevation.


**Plate 5-50** Derryquay School West Culvert**.**

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-61 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-61 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Removal of debris from southern riverbed near east abutment. Accumulation of debris and branches. (4m$^2$) | Screened in – Instream works required. |
| Riverbed | The SW embankment and wingwall is scoured and has consequently rotated away from the structure.<br>Scour repairs to underpin the existing wingwall and carry out concrete repairs where the wall has separated (5m$^2$) | Screened in – Instream works required. |
| Embankments/Revetments | Removal of vegetation required on all embankments within 1m of bridge structure (16m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Removal of debris and silt deposits from drainage gullies. 1 no. southern side of bridge. (1 no.) | Screened out. Works limited to bridge deck. |

### Mitigation Measures

#### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

#### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.29. The Red Bridge [KY-N86-014.00]

The Red Bridge is a single span stone masonry arch bridge. The span is 2.91m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 250m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 200m upstream of the Tralee Bay Complex SPA. Plate 5-51 shows the south elevation.

**Plate 5-51 The Red Bridge.**

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-62 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-62 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation required from all embankments within 1m of bridge structure (20m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Removal of debris and silt deposits from drainage gullies. 2 no. southern side of bridge and 2 no. Northern side. (4 no.) | Screened out. Works limited to bridge deck. |
| Wing/Spandrel/Retaining Walls | Undermining and masonry loss at north west wing wall. 2m$^3$ masonry repairs are required. (2m$^3$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.30. Glasheen Bridge [KY-N86-017.00]

The Glasheen Bridge is a single span stone masonry arch bridge. The span is 3.08m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 300m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 300m upstream of the Tralee Bay Complex SPA. Plate 5-52 shows the north elevation.

**Plate 5-52** Glasheen Bridge.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats;

large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-63 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-63 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation required from all embankments within 1m of bridge structure. (16m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of vegetation from southern wing walls. (8m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Abutments | Masonry repointing at southern end of east abutment. At least 1m$^2$ of repairs required. (1m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

## 5.8.3.31. Derrymore Bridge [KY-N86-018.00]

The Derrymore Bridge is a single span arch bridge. It is a masonry arch on the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 7.61m. The substructure consists of 2 masonry abutments. There are masonry parapets on both sides of the carriageway. The structure is located 930m upstream of the Tralee Bay and Magharees Peninsula, West to Cloghane SAC and located 900m upstream of the Tralee Bay Complex SPA. Plate 5-53 shows the north elevation.

**Plate 5-53** Derrymore Bridge.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-64 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-64 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of vegetation and moss from both parapet coppings. (18m$^2$) | Screened out. Vegetation is not QI of the SAC. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation required from all embankments within 1m of bridge structure. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Deck/slab/arch barrel | Masonry repointing at north west end of span. | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

## Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

### 5.8.3.32. Mountoven Culvert [KY-N86-022.20]

Mountoven Culvert is a single span masonry arch structure with masonry parapet walls along the road. The bridge carries the N86 over the Cappaclough West Stream. Tralee Bay and Magharees Peninsula, West to Cloghane SAC is located 1.1km downstream of bridge, while Tralee Bay Complex SPA is 1.9km downstream of bridge. Plate 5.54 displays the masonry face of the bridge.

**Plate 5-54** Mountoven Culvert.

The qualifying interests of Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA are listed in Section 5.2. The qualifying interests that could be impacted are estuaries, mudflats; large shallow inlets and bays; reefs; otter and wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-65 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-65 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of vegetation from parapet faces and parapet copping stones. (36m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Removal of vegetation required on all embankments within 1m of bridge structure (24m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of vegetation to spandrel and wing walls. Tree removal from north east spandrel wall. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Masonry repointing of parapet faces after vegetation removal. 6m$^2$ of masonry repointing is expected. (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to spandrel and wing walls after vegetation clearance. 6m$^2$ of masonry repointing is expected. (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Masonry repointing to localised areas at northern arch barrel. There is a crack throughout the whole arch length. The crack extends from east to west abutment. | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| | Width of the crack is 25mm. Southern arch (5m$^2$) | |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

## Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Tralee Bay and Magharees Peninsula, West to Cloghane SAC and the Tralee Bay Complex SPA.

## 5.8.4. Limerick

### 5.8.4.1. Creggane Bridge 2 [LC-N20-003.00]

Creggane Bridge 2 is a single span concrete slab structure with an overall span width of 7.21m. Masonry parapet walls are located along the road. The bridge carries the N20 across the River Maigue. The Lower River Shannon SAC is located 28km downstream of the bridge, while the River Shannon and River Fergus Estuaries SPA is approximately 38km downstream of bridge. Plate 5.55 displays the east elevation of the structure.


**Plate 5-55** Creggane Bridge 2.

The qualifying interests of The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; lamprey; salmon and otter. The potential impact to the SAC/SPA is the deterioration of surface water quality.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-66 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-66 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Wing/Spandrel/Retaining Walls | Concrete repair with reinforcement to the edge beam on the west face of the bridge (10m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

#### Mitigation Measures

##### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

### 5.8.4.2. Bridge Street Structure Abbeyfeale [LC-N21-001.00]

The Bridge Street Structure, Abbeyfeale, is a single span arch bridge. It is a masonry arch in the north side, and it has been widened in the south side using a reinforced concrete arch. The span is 3.32m. The substructure consists of 2 masonry and concrete abutments. There are masonry parapets on both sides of the carriageway. The bridge carries a small, unnamed stream below Bridge Street, 100m upstream of the River Feale. The structure is located 70m upstream of the Lower River Shannon SAC. Plate 5-56 shows the east elevation.

**Plate 5-56** Bridge Street Structure Abbeyfeale**.**

The qualifying interests of Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; [redacted] lamprey; salmon and otter. The potential impacts to the SAC are the loss or modification of habitat; reduction in species density and deterioration of surface water quality.

[redacted]

## Proposed Works

The proposed works at this bridge are detailed in Table 5-67 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-67 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation clearance from south embankments to maintain 1m clearance around structure (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Concrete render to full west elevation (20m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.4.3. Dromtrasna Culvert [LC-N21-001.40]

Dromtrasna Culvert comprises a single span masonry arch structure with a box culvert extension. There is no safety barrier or parapet wall along the roadside. The structure carries the N21 across the Dromtrasna Stream 500m upstream of the Lower River Shannon SAC. Plate 5.57a displays the masonry arch, while Plate 5.57b displays the box culvert.

**Plate 5-57a** Dromtrasna Culvert.

**Plate 5-57b** Dromtrasna Culvert.

The qualifying interests of Lower River Shannon SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; lamprey; salmon and otter. The potential impacts to the SAC are the loss or modification of habitat; reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Lower River Shannon SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-68 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-68 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Repairing of rock armour wall at south east of riverbed. There is a partial collapse of a single rock at the bottom row of the rock armour wall. Scouring holes underneath bottom row of rocks were found. 10m$^2$. | Screened In. Instream works required. |
| Parapets/Safety barrier | Removal of vegetation growth from south masonry parapet 10m$^2$. | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Removal of vegetation from embankments 200m$^2$. | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of vegetation from south east and south west masonry spandrel walls 12m$^2$. | Screened out. Vegetation is not QI of the SAC. |

### Mitigation Measures

#### *Scour Repairs*

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

No concrete or cementitious product will be permitted to enter the watercourse. This shall be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. Tools and equipment shall not be cleaned in the watercourse, wash bags shall be used at an appropriate distance from the river. The plant will also not be permitted to enter or refuel within 50m of the watercourse.

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on The Lower River Shannon SAC.

### 5.8.4.4. Ballysimon N24 Culvert [LC-N24-011.00]

Ballysimon N24 Culvert is a single span pipe culvert with an overall span width of 6.47m. Timber fencing and steel safety barriers line the road. The culvert carries the N24 over the Groody River, 3.7km upstream of Lower River Shannon SAC and 7.2km upstream of River Shannon and River Fergus Estuaries SPA. Plate 5.58 displays the structure.

**Plate 5-58** Ballysimon N24 Culvert.

The qualifying interests of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA are listed in Section 5.2. The qualifying interests that could be impacted estuaries; mudflats; floating river vegetation; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat; reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Lower River Shannon SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-69 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-69 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation removal from embankments around both elevations to maintain 1m clearance around structure (200m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of vegetation from gabion walls (60m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | 4 no. drain gullies. (4 no.) | Screened out. Works to be conducted within deck. |
| Wing/Spandrel/Retaining Walls | High-pressure hosing of head walls (60m$^2$) | Screened In. Hydrological linkage. |
| Wing/Spandrel/Retaining Walls | Maintenance of gabions wall at north east (8m) | Screened In. Instream works required. |

## Mitigation Measures

### *High-pressure hosing of surface*

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

The use of hi h pressure hosing is not permitted in Natura 2000 sites, [redacted] In such sites only soft washing (<500psi) of metal parapets is allowed; only in cases where the waste waters arising from power washing can be contained. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Due consideration must also be given to run-off and the risk of any contaminants removed from the surface entering the adjoining watercourses; or by doing so potentially affecting the surrounding flora and fauna. To reduce the risk of generating contaminated water a pre-cleaning will be carried out. Pre-cleaning includes: picking up litter, sweeping up dirt and other debris, and using an absorbent to remove any oil or grease stains from the metal rails.

Any waste waters arising from power washing cannot be disposed of to the adjoining watercourse, but the Contractor must dispose of that water by containment and removal from site. To contain wastewater the appointed Contractor must have access to storm drain mats (to cover grates) and flexible berms (to direct and or contain wastewater). If the wastewater stream does not include any chemical additives, oils, greases or hydrocarbons, it can be discharged by filtration through adjoining vegetation. If, however, evidence of oil is visible in the wastewater stream that this water cannot be discharged to the adjoining watercourses and must be removed from site.

### *Maintenance of slope protection*

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

No concrete, cementitious or fine partial material will be permitted to enter the watercourse. This will be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering

the system. One span/culvert structures may not have sufficient capacity accommodate the required working area for a localised diversion. In this instance fluming of the entire waterbody will be carried out in line with Inland Fisheries Ireland, 2016 *Guidelines on protection of fisheries during construction works in and adjacent to water*. The waterbodies will be diverted from upstream to downstream of the works area by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. If over pumping is required, a second pump shall be available on site in case of failure of the primary pump.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA.

### 5.8.4.5. Massy's Bridge [LC-N69-012.00]

Massy's Bridge is a single span masonry arch bridge with concrete slab sub-structure. The overall span width is 3.8m. Concrete parapet walls line the road. The bridge carries the N69 over the Barnakyle Stream 1.1km upstream of Lower River Shannon SAC and 1.7km upstream of River Shannon and River Fergus Estuaries SPA. Plate 5.59 displays the south elevation.


**Plate 5-59** Massy's Bridge.

The qualifying interests of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA are listed in Section 5.2. The qualifying interests that could be impacted estuaries; mudflats; floating river vegetation; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat; reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Lower River Shannon SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-70 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-70 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation removal from embankments around both elevations to maintain 1m clearance around structure (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Remove areas of minor vegetation prior to repointing (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to open joints (10m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Deck/slab/arch barrel | Repointing to arch adjacent to crown skim (5m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Concrete skim to full outside face of the north parapet, spandrel and wingwalls extending over and including the NE wingwall. | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Concrete repair to open joints between parapet and adjacent wall. (20m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Concrete repairs*

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

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

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

Mixing of materials shall be carried out at least 25 metres away from the riverbank on an impermeable surface, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. The worker must also ensure that no material or debris enters the watercourse or cause pollution to the surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall

be held in place below the area of the works to prevent any waste material entering the watercourse. Once the area has been repaired and brushed back to the desired finish, the geotextile will be carefully removed, and the waste material will be removed off-site and disposed of appropriately at an approved site.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA.

## 5.8.5. Tipperary

### 5.8.5.1. Nenagh River Bridge [TN-N52-002.00]

The Nenagh River Bridge is a 4-span corrugated steel pipe culvert. The span lengths are around 4.5m. There are masonry with steel railing parapets on both sides of the carriageway. The structure is located 9km upstream of the Lough Derg (Shannon) SPA. Plate 5-60 shows the west elevation.

**Plate 5-60** Nenagh River Bridge.

The qualifying interests of Lough Derg (Shannon) SPA are listed in Section 5.2. The qualifying interests that could be impacted are the wetland SCIs of the SPA. The potential impacts to the SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-71 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-71 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Vegetation removal from the outer faces of the masonry parapets. (2m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Remove vegetation from revetments on both elevations of the structure (200m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Spalling to both parapets Edge Beams under the connections with the base of the steel railing parapets. (3m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Piers | Spalling to concrete cover in the middle pier of the west downstream side to be repaired. (1m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Power hosing of the parapet railings to remove algae staining, 50m$^2$. (1 it) | Screened in – Hydrological linkage. |

#### Mitigation Measures

##### *Concrete repairs*

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter

layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

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

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

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

### *High-pressure hosing of surface*

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

The use of hi h pressure hosing is not permitted in Natura 2000 sites, [redacted] In such sites only soft washing (<500psi) of metal parapets is allowed; only in cases where the waste waters arising from power washing can be contained. If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

Due consideration must also be given to run-off and the risk of any contaminants removed from the surface entering the adjoining watercourses; or by doing so potentially affecting the surrounding flora and fauna. To reduce the risk of generating contaminated water a pre-cleaning will be carried out. Pre-cleaning includes: picking up litter, sweeping up dirt and other debris, and using an absorbent to remove any oil or grease stains from the metal rails.

Any waste waters arising from power washing cannot be disposed of to the adjoining watercourse, but the Contractor must dispose of that water by containment and removal from site. To contain wastewater the appointed Contractor must have access to storm drain mats (to cover grates) and flexible berms (to direct and or contain wastewater). If the wastewater stream does not include any chemical additives, oils, greases or hydrocarbons, it can be discharged by filtration through adjoining vegetation. If, however, evidence of oil is visible in the wastewater stream that this water cannot be discharged to the adjoining watercourses and must be removed from site.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Derg (Shannon) SPA.

## 5.8.5.2. Grange Bridge [TN-N52-003.00]

Grange Bridge is a single span masonry arch bridge with concrete slab sub-structure. The overall span width is 3.15m. Concrete parapet walls line the road. The bridge carries the N52 over the Gortadalaun Stream 9.2km upstream of Lough Derg (Shannon) SPA. Plate 5.61 displays the masonry face.

**Plate 5-61** Grange Bridge.

The qualifying interests of Lough Derg (Shannon) SPA are listed in Section 5.2. The qualifying interests that could be impacted are the wetland SCIs of the SPA. The potential impacts to the SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-72 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-72 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Vegetation clearance from embankments to maintain 1m clearance around structure, including removal of fallen tree at west elevation (50m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repair to SE wing wall. (2m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Crack to the Northwest wing wall which should be injected. (0.5m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Abutments | Crack between Southwest wing wall and south abutment to be injected. (2m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

### *Concrete repairs*

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

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

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

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

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Derg (Shannon) SPA.

## 5.8.5.3. Balyeiragh Bridge [TN-N65-001.00]

Balyeiragh Bridge is a single concrete slab structure. The overall span width is 6.5m. Masonry parapet walls and steel safety barriers line the road. The bridge carries the N65 over the Lorrha Stream within the Lough Derg, North-East Shore SAC and Lough Derg (Shannon) SPA. Plate 5.62 displays the bridge.

**Plate 5-62** Balyeiragh Bridge.

The qualifying interests of Lough Derg, North-East Shore SAC and Lough Derg (Shannon) SPA are listed in Section 5.2. The qualifying interests that could be impacted are fens and the wetland SCIs of the SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-73 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-73 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Clearance of the watercourse upstream east. (4m$^2$) | Screened in – Instream works required. |
| Embankments/Revetments | Vegetation clearance from embankments to maintain 1m clearance around structure, including removal of fallen tree at west elevation (50m$^2$) | Screened out. Vegetation is not QI of the SAC. |

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Bridge surface | Clear blocked drain on the upstand of the east overbuild. (1 no.) | Screened out. Works to be carried out within the deck. |
| Parapets/Safety barrier | Extensive mortar repair to the copping of both parapets, some blocks are loose. ($9m^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Clearance of watercourse (Debris Removal)*

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

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

For larger debris that requires cutting or break up prior to its removal, this must be done using appropriate equipment; e.g. it is not permitted to drag such material ashore using the bucket on a long-reach digger. Where needed a maximum of 3 no. operatives shall be permitted to enter the watercourse in order to undertake the works. Strict adherence to biosecurity procedures and protocols is also a requirement. Biosecurity protocols are outlined in Section 2.1.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

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

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Lough Derg, North-East Shore SAC and Lough Derg (Shannon) SPA.

### 5.8.5.4. Carrick-on-Suir Bridge 2 [TS-N24-003.00]

The Carrick-on-Suir Bridge 2 is a single span reinforced concrete slab bridge. The span is 4.85m. The substructure consists of 2 reinforced concrete abutments. There are masonry parapets on both sides of the carriageway. The structure is located 100m upstream of Lower River Suir SAC. Plate 5-63 shows the south elevation.


**Plate 5-63** Carrick-on-Suir Bridge 2**.**

The qualifying interests of Lower River Suir SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; white-clawed crayfish; lamprey; salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Lower River Suir SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-74 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-74 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments.<br>Removal of rubbish and debris also. (20m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Masonry repair to the coping of the south masonry parapets at the west side. (0.1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Masonry repair to the base of the SW wingwall (1m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Concrete repair to copings of the north parapet, including the parapet on the Northwest wing wall. (0.7m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Concrete repair to crack in the inner face of north parapet (0.2m$^2$) | Screened out. Works to be conducted within the deck. |
| Deck/slab/arch barrel | Spalling to the top of the deck at south side to be repaired with concrete. (0.1m$^2$) | Screened out. Works to be conducted within the deck. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

Assessment of In-combination effects

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

Conclusion/ Recommendation

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

### 5.8.5.5. Canal Bridge [TS-N24-006.00]

The Canal Bridge is a 6.1m single span concrete slab. The parapets are masonry with steel railing. The structure is within the Lower River Suir SAC. Plate 5-64 shows the south elevation.

**Plate 5-64** Canal Bridge.

The qualifying interests of Lower River Suir SAC are listed in Section 5.2. The qualifying interests that could be impacted are floating river vegetation; white-clawed crayfish; lamprey; salmon and otter. The potential impacts to the SAC are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Lower River Suir SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-75 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-75 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments 20m$^2$ Moss in concrete revetment should be removed 5m2. (25m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Reshape embankment at the Northwest. (5m$^3$) | Screened in – works could release loose soils to the watercourse. |
| Parapets/Safety barrier | Cracks in both parapets should be repointed. (2m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Vertical Cracks in all wing walls should be injected. (15 m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |

### Mitigation Measures

#### *Maintenance of slope protection*

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

No concrete, cementitious or fine partial material will be permitted to enter the watercourse. This will be achieved by diverting the water away from the working area with localised fixed shuttering and/or sealed sand bags. If a

pumping system is required, the pumping system shall be fitted with appropriate screens to avoid fish entering the system. One span/culvert structures may not have sufficient capacity accommodate the required working area for a localised diversion. In this instance fluming of the entire waterbody will be carried out in line with Inland Fisheries Ireland, 2016 Guidelines on protection of fisheries during construction works in and adjacent to water. The waterbodies will be diverted from upstream to downstream of the works area by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. The discharge pipe of such a pumping system will be required to either have a silt sock attached to prevent the discharge of silt laden water back into the watercourse, or water will be discharged to the grassy embankment and allowed to filter through the vegetation. A secondary pump shall be stored on site in the event of a malfunction of the primary pump. If over pumping is required, a second pump shall be available on site in case of failure of the primary pump.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

Mixing of mortar shall be carried out at least 25 metres away from the riverbank on an impermeable surface, and any waste material (including washings from the mixer) shall be stored in mortar bins and taken off-site. Great care is to be taken to ensure that no lime mortar or debris enters the watercourse or cause pollution to the

surrounding land during works. Irrespective of the approach to works adopted, as noted above a geotextile membrane shall be held in place below the area of the works to prevent any waste mortar entering the watercourse. Once the area has been repointed and brushed back to the desired finish the geotextile will be carefully removed and the waste mortar will be removed off-site and disposed of appropriately at an approved site.

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

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

## 5.8.6. Waterford

### 5.8.6.1. Old Pike Bridge [WC-N25-017.00]

Old Pike Bridge is a double span masonry arch structure with an overall length of 11.13m. Masonry parapet walls line the road. The bridge carries the N25 over the Deelish Stream 370m upstream of Dungarvan Harbour SPA. Plate 5.65 shows the south elevation.


**Plate 5-65** Old Pike Bridge.

The qualifying interests of Dungarvan Harbour SPA are listed in Section 5.2. The qualifying interests that could be impacted are the wetland dependent SCIs of the SPA. The potential impact to the SPA is the deterioration of surface water quality.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-76 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-76 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Removal of vegetation on approach parapets. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Vegetation clearance from embankments to maintain 1m clearance around structure (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Remove vegetation growth from wing and spandrel walls throughout. (10m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to localised open joints (6m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

#### Mitigation Measures

##### *Masonry Repointing and Repair*

In some locations repointing over water will be possible on foot; where the mason cannot reach the area of repointing from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for

access. All work platforms must also be covered by geotextile filter layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

#### Assessment of In-combination effects

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Dungarvan Harbour SPA.

### 5.8.6.2. Tourig River Bridge [WC-N25-025.00]

The Tourig River Bridge is a 3-span precast prestressed reinforced concrete slab/girder bridge. The span lengths are 31.6m, 38.5m and 32.1m. The substructure consists of 2 reinforced concrete abutments and 2 reinforced concrete piers. There are aluminium parapets on both sides of the carriageway. The structure is within the Blackwater River (Cork/Waterford) SAC and within the Blackwater Estuary SPA. Plate 5-66 shows the east elevation.

**Plate 5-66** Tourig River Bridge.

The qualifying interests of Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA are listed in Section 5.2. The qualifying interests that could be impacted are the estuaries; mudflats; floating river vegetation; white-clawed crayfish; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the Loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Blackwater River (Cork/Waterford) SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-77 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-77 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Embankments/Revetments | Removal of vegetation to embankments. 1m wide strip at each side of the bridge to provide access. (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | Cleaning of drain gullies (6 no.) | Screened out. Works limited to within the deck. |
| Wing/Spandrel/Retaining Walls | Concrete repair to wingwalls where spalling is evident (20m$^2$) | Screened in – use of wet concrete over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | High pressure hosing to clean steel parapets, 340m$^2$. (1 it) | Screened in – potential for chemical agents to enter the adjacent watercourse. |
| Wing/Spandrel/Retaining Walls | Remove graffiti from wingwalls (10m$^2$) | Screened in – potential for chemical agents to enter the adjacent watercourse. |
| Beams/girders/transverse beams | Overpainting of graffiti visible on beams (5m$^2$) | Screened in – potential for chemical agents to enter the adjacent watercourse. |

## Mitigation Measures

### *Concrete repairs*

Where personnel cannot reach the works area from the ground, work platforms (scaffolds, ladders and underbridge inspection units) will be used for access. All work platforms must also be covered by geotextile filter

layers (or equivalent catch system) to prevent mortar or defective concrete falling through the works platform into the watercourse and to allow for any waste material/mortar to be removed from site and disposed of appropriately at an approved site. The geotextile will extend up the sides of the platforms a minimum of 150mm to stop material falling off the edge. Removal of and cleaning of the geotextile from any platform shall be carried out in such a manner to prevent debris, grout etc. falling into the watercourse.

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

### *High-pressure hosing of surface*

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

Due consideration must also be given to run-off and the risk of any contaminants removed from the surface entering the adjoining watercourses; or by doing so potentially affecting the surrounding flora and fauna. To reduce the risk of generating contaminated water a pre-cleaning will be carried out. Pre-cleaning includes: picking up litter, sweeping up dirt and other debris, and using an absorbent to remove any oil or grease stains from the metal rails.

Any waste waters arising from power washing cannot be disposed of to the adjoining watercourse, but the Contractor must dispose of that water by containment and removal from site. To contain wastewater the appointed Contractor must have access to storm drain mats (to cover grates) and flexible berms (to direct and or contain wastewater). If the wastewater stream does not include any chemical additives, oils, greases or hydrocarbons, it can be discharged by filtration through adjoining vegetation. If, however, evidence of oil is visible in the wastewater stream that this water cannot be discharged to the adjoining watercourses and must be removed from site.

If the bridge drainage at these sites leads directly into the watercourse, the outfall of all gullies on the bridge must be blocked during works and the gullies must be sucked out following the power hosing to ensure the water and waste material does not reach the watercourse.

### *Graffiti removal and overpainting*

All graffiti to be removed from wingwalls and beams shall be overpainted. No gels may be applied.

Paint shall be applied by hand using a small brush directly to the areas affected. Paint shall not be sprayed. Areas to be overpainted on the wingwalls shall be completed with a textile membrane placed on the ground below the works area. Areas on the beams shall be overpainted from an overbridge unit from the deck of the bridge. The base of the unit shall be lined with a textile membrane to prevent spillage of paint to the environment.

Overpainting shall be conducted in dry conditions with low wind speeds.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA.

## 5.8.6.3. Ballyvecane Upper Bridge [WC-N72-000.60]

Ballyvecane Upper Bridge is a single span masonry arch with a width of 9.38m. Masonry parapet walls line the road. The bridge carries the N72 over the Owbeg River. Blackwater River (Cork/Waterford) SAC is located 7km downstream of the bridge. Blackwater Estuary SPA is 19.5km downstream of the bridge. Plate 5.67 displays the masonry face of the bridge.


**Plate 5-67** Ballyvecane Upper Bridge.

The qualifying interests of Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA are listed in Section 5.2. The qualifying interests that could be impacted are the estuaries; mudflats; floating river vegetation; white-clawed crayfish; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Blackwater River (Cork/Waterford) SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

### Proposed Works

The proposed works at this bridge are detailed in Table 5-78 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-78 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Full devegetation of both parapets over a length of 10m (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Full devegetation of the embankments on both sides of the structure including the banks of the riverbed up to 3m upstream and downstream of the structure (80m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Full devegetation of the spandrels and wingwalls over a length of 10m (60m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Parapets/Safety barrier | Repointing to open joint following vegetation removal (25m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Repointing to all open joints following vegetation removal (20m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

## Assessment of In-combination effects

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

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

#### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA.

### 5.8.6.4. Little Bridge [WC-N72-003.00]

The Little Bridge is a 5-span masonry arch bridge with masonry parapets on both sides of the carriageway. The maximum span is 5.35m and the minimum span is 3.90m. The structure is within the Blackwater River (Cork/Waterford) SAC. Blackwater Estuary SPA is ca. 16km downstream of the bridge. All arch barrels have been gunited with 120mm thick sprayed concrete. Plate 5-68 shows the east elevation.

**Plate 5-68** Little Bridge.

The qualifying interests of Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA are listed in Section 5.2. The qualifying interests that could be impacted are the estuaries; mudflats; floating river vegetation; white-clawed crayfish; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Blackwater River (Cork/Waterford) SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

#### Proposed Works

The proposed works at this bridge are detailed in Table 5-79 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-79 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Parapets/Safety barrier | Remove localized light vegetation growth on inside/road face of parapets (8m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. (30m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Removal of light vegetation growth to wing and spandrel walls on both elevations (15m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Bridge surface | 7no. drain gullies at base of parapet to be cleared. (7 no.) | Screened out. Works to be limited to within deck. |
| Parapets/Safety barrier | Local repointing where vegetation was noted particularly under the capping. Works on road side face. (8m) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Wing/Spandrel/Retaining Walls | Repointing to local open joints at areas where vegetation growth was noted to wing and spandrel walls on both elevations (15m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |

## Mitigation Measures

### *Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Pre-construction Otter survey*

A pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site.

In accordance with the NRA guidelines, the following guidelines shall be followed:

- No physical damage or disturbance to an otter holt shall occur;
- No works shall be undertaken within 150m of any holt at which breeding females or cubs are present;
- No wheeled or tracked vehicles should be used within 20m of an active non-breeding holt.

If an otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented.

Assessment of In-combination effects

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

Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA.

### 5.8.6.5. Finisk Bridge [WC-N72-006.00]

The Finisk Bridge is a 4-span masonry arch bridge with reinforced concrete arch extension to the north side. The maximum span is 5.44m and the minimum span is 4.05m. The structure is within the Blackwater River (Cork/Waterford) SAC. The Blackwater Estuary SPA is ca. 23km downstream of the bridge. Plate 5-69 shows the south elevation.

**Plate 5-69** Finisk Bridge.

The qualifying interests of Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA are listed in Section 5.2. The qualifying interests that could be impacted are the estuaries; mudflats; floating river vegetation;

white-clawed crayfish; lamprey; salmon; otter and wetland SCIs of SPA. The potential impacts to the SAC/SPA are the loss or modification of habitat, physical disturbance of species, reduction in species density and deterioration of surface water quality.

There are no records of freshwater pearl mussel downstream of the bridge. Mussels for which the Blackwater River (Cork/Waterford) SAC is designated are not located on watercourses hydrologically connected to the bridge. Therefore, they are not considered within the zone of influence.

With respect to the protection of Otter in the wider environment, as there is a significant amount of vegetation around the bridge, the environs of the bridge are to be checked for signs of otter prior to the commencement of works (see Table 5-4). Works are not permitted to continue if an otter holt is located close to the bridge until its status is further confirmed.

## Proposed Works

The proposed works at this bridge are detailed in Table 5-80 below. The table also contains a screening recommendation regarding the potential for the works to give rise to likely significant effects.

**Table 5-80 - Work elements and potential for likely significant effects.**

| Bridge Component | Work Element | Screening Recommendation |
|---|---|---|
| Riverbed | Concrete repairs to the base of the NE approach wingwall on the upstream approach (10m$^2$) | Screened in – use of wet mortar within watercourse and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Devegetation of the parapet at the SW corner. down past the chevron signage. Works located over land (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Embankments/Revetments | Clearance of 1m strip of vegetation away from structure on all embankments. (40m$^2$) | Screened out. Vegetation is not QI of the SAC. |
| Wing/Spandrel/Retaining Walls | Vegetation removal from the south wingwalls located over land (30m$^2$) | Screened out. Works to be limited to within deck. |
| Wing/Spandrel/Retaining Walls | Masonry repointing to the south wingwalls located over land (20m$^2$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Repair to parapet at the NW corner over a length of 5.5m (2m$^3$) | Screened in – use of wet mortar over water and therefore a surface water pathway is present. |
| Parapets/Safety barrier | Concrete repair to cracking on north parapet and at location where vegetation is evident. Road inside face (2m$^2$) | Screened out. Works to be limited to within deck. |

## Mitigation Measures

### *Concrete repairs*

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

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

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Masonry Repointing and Repair*

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

Where instream work platforms are required and permitted, timbers will be positioned under each leg to prevent them sinking into the riverbed. The placement of instream supports on the riverbed must be supervised by the Contractor's ecologist, in liaison with the Resident Engineer, to ensure no risk to instream ecology. Strict application of biosecurity measures must also be applied to any work platforms used instream. Biosecurity protocols are outlined in Section 2.1.

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

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

The construction site must be designed to allow free passage of otter commuting routes. Measures will comprise capping of pipes when not in use, provisions of a mammal ramp within excavations, and any artificial lighting will be directed away from the watercourse.

*Pre-construction Otter survey*

A pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site.

In accordance with the NRA guidelines, the following guidelines shall be followed:

- No physical damage or disturbance to an otter holt shall occur;

- No works shall be undertaken within 150m of any holt at which breeding females or cubs are present;
- No wheeled or tracked vehicles should be used within 20m of an active non-breeding holt.

If an otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented.

### Assessment of In-combination effects

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

### Conclusion/ Recommendation

With respect to the works and mitigation measures proposed above, it is the opinion of the authors of this report that, provided the mitigation measures described above are implemented, the works proposed at this bridge will not result in adverse effects on Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA.

# 6. Conclusions

This NIS provides the competent authority with supporting information to undertake Appropriate Assessment in relation to the proposed works at 68 bridges in the Munster region under the Munster Term Maintenance Contract No 3 (Year 4).

This NIS has examined the potential impacts of the proposed works on the integrity of European sites within the zone of influence of the 68 bridges, alone and in combination with other plans and projects, considering a sites' structure, function and conservation objectives. Where potential significant impacts were identified, mitigation measures have been recommended to preclude these impacts.

Thus, the potential direct, indirect and cumulative impacts on the qualifying interests, and their associated conservation objectives, for SACs and SPAs within the zone of influence of the proposed project, and the implementation of the proposed mitigation measures, it has been concluded by the authors of this report that the proposed project, i.e. maintenance works at 68 bridges, will not have an adverse effect on the integrity of those SACs and SPAs.

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# Appendices

# Appendix A. Qualifying Interests of Natura 2000 sites

| Blackwater River (Cork/Waterford) SAC (2170) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CC-N20-019.00 | Within | Blackwater [Munster] | Blackwater[Munster]_SC_090 |
| CC-N72-004.00 | Within | Owentaraglin 18 | Blackwater[Munster]_SC_020 |
| CC-N72-010.00 | Within | Allow | Dalua_SC_020 |
| CC-N72-013.00 | Within | Awbeg [Kanturk] | Blackwater[Munster]_SC_060 |
| CC-N72-014.00 | Within | Non-Listed | Blackwater[Munster]_SC_090 |
| CC-N72-022.00 | Within | South Caherduggan | Blackwater[Munster]_SC_090 |
| CC-N72-027.00 | Within | North Caherduggan | Blackwater[Munster]_SC_090 |
| CC-N73-005.00 | Within | Awbeg [Buttevant] | Blackwater[Munster]_SC_100 |
| WC-N25-025.00 | Within | Tourig | Tourig_SC_010 |
| WC-N72-003.00 | Within | Glennafallia 18 | Blackwater[Munster]_SC_140 |
| WC-N72-006.00 | Within | Finisk | Finisk_SC_010 |
| CC-N72-005.00 | No; ca. 7.8km d/s of bridge | Knocknageeha_East | Blackwater[Munster]_SC_030 |
| CC-N72-006.00 | No; ca. 5.7km d/s of bridge | Skagh | Blackwater[Munster]_SC_030 |
| CC-N72-007.00 | No; ca. 4km d/s of bridge | Maulyclickeen | Blackwater[Munster]_SC_030 |
| CC-N72-019.00 | No; ca. 600m d/s of bridge | Scarteen 18 | Blackwater[Munster]_SC_090 |
| CC-N72-023.00 | No; ca. 500m d/s of bridge | South Caherduggan | Blackwater[Munster]_SC_090 |
| CC-N72-024.00 | No; ca. 1km d/s of bridge | South Caherduggan | Blackwater[Munster]_SC_090 |
| CC-N72-025.00 | No; ca. 1.3km d/s of bridge | South Caherduggan | Blackwater[Munster]_SC_090 |
| CC-N73-002.00 | No; ca 2.1km d/s of bridge | Non-EPA Listed Drain | Blackwater[Munster]_SC_090 |
| CC-N73-003.00 | No; ca. 2.4km d/s of bridge | Monanimy_Lower | Blackwater[Munster]_SC_090 |
| KY-N72-012.00 | No; ca. 1.5km d/s of bridge | Cullavaw (Stream) | Blackwater[Munster]_SC_010 |
| WC-N72-000.60 | No; ca. 7km d/s of bridge | Owbeg (Waterford) | Blackwater[Munster]_SC_130 |
| **SCI Description** | | | |
| Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *<br>*Taxus baccata* woods of the British Isles [91J0] *<br>Estuaries [1130]<br>Mudflats and sandflats not covered by seawater at low tide [1140]<br>Perennial vegetation of stony banks [1220]<br>Salicornia and other annuals colonising mud and sand [1310]<br>Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]<br>Mediterranean salt meadows *(Juncetalia maritimi)* [1410]<br>Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]<br>Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>[redacted]<br>White-clawed Crayfish *(Austropotamobius pallipes)* [1092]<br>Sea Lamprey *(Petromyzon marinus)* [1095]<br>Brook Lamprey *(Lampetra planeri)* [1096]<br>River Lamprey *(Lampetra fluviatilis)* [1099]<br>Twaite Shad *(Alosa fallax fallax)* [1103]<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Ballinskelligs Bay And Inny Estuary SAC (000335) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N70-040.40 | SAC ca. 1.3km d/s of bridge | Unnamed Watercourse | Finglasriver[Waterville]_SC_01 |
| **SCI Description** | | | |
| Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]<br>Mediterranean salt meadows *(Juncetalia maritimi)* [1410]<br>Petalwort *(Petalophyllum ralfsii)* [1395] | | | |

| Carrowmore Point To Spanish Point and Islands SAC (001021) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CL-N67-013.00 | SAC ca. 1km d/s of bridge | Non-Listed | KiltumperStream_SC_010 |
| **SCI Description** | | | |
| Coastal lagoons [1150] *<br>Reefs [1170]<br>Perennial vegetation of stony banks [1220]<br>Petrifying springs with tufa formation (Cratoneurion) [7220] *<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Castlemaine Harbour SAC (000343) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N72-002.00 | Within | Gweestin | Laune_SC_020 |
| KY-N72-003.00 | Within | Gortnaskarry | Laune_SC_020 |
| KY-N70-016.00 | No; ca. 400m d/s of bridge | Ballintleave | Caragh_SC_010 |
| KY-N70-020.00 | No; ca. 2.8km d/s of bridge | Curra | Caragh_SC_010 |
| **SCI Description** | | | |
| Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *<br>Estuaries [1130]<br>Mudflats and sandflats not covered by seawater at low tide [1140]<br>Annual vegetation of drift lines [1210]<br>Perennial vegetation of stony banks [1220]<br>Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]<br>Salicornia and other annuals colonising mud and sand [1310]<br>Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]<br>Mediterranean salt meadows *(Juncetalia maritimi)* [1410]<br>Embryonic shifting dunes [2110]<br>Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]<br>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] *<br>Dunes with *Salix repens* ssp. *argentea (Salicion arenariae)* [2170]<br>Humid dune slacks [2190]<br>Sea Lamprey *(Petromyzon marinus)* [1095]<br>River Lamprey *(Lampetra fluviatilis)* [1099]<br>Salmon *(Salmo salar)* [1106]<br>Otter *(Lutra lutra)* [1355]<br>Petalwort *(Petalophyllum ralfsii)* [1395]<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Glengarriff Harbour and Woodland SAC (000090) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CC-N71-001.00 | No; ca. 500m d/s | Carrigrour | Glengarriff_SC_010 |
| **SCI Description** | | | |
| Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]<br>*Geomalacus maculosus* (Kerry Slug) [1024]<br>*Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]<br>*Lutra lutra* (Otter) [1355]<br>*Phoca vitulina* (Harbour Seal) [1365]<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Kenmare River SAC [002158] | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N70-050.00 | No; ca. 750m d/s of bridge | Owreagh | Sneem_SC_010 |
| KY-N70-052.60 | No; ca. 150m d/s of bridge | Derreenamackan | Kealduff_SC_010 |
| **SCI Description** | | | |
| Large shallow inlets and bays [1160]<br>Reefs [1170]<br>Perennial vegetation of stony banks [1220]<br>Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]<br>Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]<br>Mediterranean salt meadows *(Juncetalia maritimi)* [1410]<br>Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]<br>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] *<br>European dry heaths [4030]<br>*Juniperus communis* formations on heaths or calcareous grasslands [5130]<br>Calaminarian grasslands of the *(Violetalia calaminariae)* [6130]<br>Narrow-mouthed Whorl Snail *(Vertigo angustior)* [1014]<br>Lesser Horseshoe Bay *(Rhinolophus hipposideros)* [1303]<br>Otter *(Lutra lutra)* [1355]<br>Harbour Seal *(Phoca vitulina)* [1365]<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Lough Derg, North-East Shore SAC [0002241] | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| TN-N65-001.00 | Within | Lorrha Stream | LorrhaStream_SC_010 |
| **SCI Description** | | | |
| Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]<br>Juniperus communis formations on heaths or calcareous grasslands [5130]<br>Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae [7210]<br>Alkaline fens [7230]<br>Limestone pavements [8240] *<br>*Taxus baccata* woods of the British Isles [91J0] *<br><br>* indicates a priority habitat under the Habitats Directive | | | |

| Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365) | | | |
|---|---|---|---|
| **Structure ID** | **Within SAC** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N22-023.00 | Within | Flesk [Kerry] | Flesk[Kerry]_SC_020 |
| KY-N22-027.00 | Within | Flesk [Kerry] | Flesk[Kerry]_SC_010 |
| KY-N70-040.40 | Within | Unnamed Watercourse | Finglasriver[Waterville]_SC_01 |
| KY-N71-001.00 | Within | Flesk [Kerry] | Laune_SC_010 |
| KY-N71-002.00 | Within | Cloghereen | Laune_SC_010 |
| KY-N71-003.00 | Within | Owengarriff (Kerry) | Laune_SC_010 |
| KY-N71-005.00 | Within | n.a. | n.a. |
| KY-N22-023.00 | No; ca. 13.5km d/s of bridge | Flesk [Kerry] | Flesk[Kerry]_SC_020 |
| KY-N22-027.00 | No; ca. 24.2km d/s of bridge | Flesk [Kerry] | Flesk[Kerry]_SC_020 |
| KY-N22-030.00 | No; > 30km d/s of bridge | Ford Currimeenavrick | Flesk[Kerry]_SC_010 |
| KY-N22-031.00 | No; > 30km d/s of bridge | Ford Currimeenavrick | Flesk[Kerry]_SC_010 |
| KY-N71-001.00 | No; ca. 2km d/s of bridge | Flesk [Kerry] | Laune_SC_010 |

**SCI Description**

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *
Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110]
Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
Northern Atlantic wet heaths with *Erica tetralix* [4010]
European dry heaths [4030]
Alpine and Boreal heaths [4060]
*Juniperus communis* formations on heaths or calcareous grasslands [5130]
Calaminarian grasslands of the *Violetalia calaminariae* [6130]
*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
Blanket bogs (* if active bog) [7130]
Depressions on peat substrates of the *Rhynchosporion* [7150]
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
*Taxus baccata* woods of the British Isles [91J0] *
Kerry Slug *(Geomalacus maculosus)* [1024]
[redacted]
Marsh Fritillary *(Euphydryas aurinia)* [1065]
Sea Lamprey *(Petromyzon marinus)* [1095]
Brook Lamprey *(Lampetra planeri)* [1096]
River Lamprey *(Lampetra fluviatilis)* [1099]
Salmon *(Salmo salar)* [1106]
Lesser Horseshoe Bat *(Rhinolophus hipposideros)* [1303]
Otter *(Lutra lutra)* [1355]
Kilarney Fern *(Trichomanes speciosum)* [1421]
Marsh Fritillary *(Najas flexilis)* [1833]
Killarney Shad *(Alosa fallax killarnensis)* [5046]

* indicates a priority habitat under the Habitats Directive

| Lower River Shannon SAC (0002165) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CL-N67-001.00 | Within | Tonavoher | Cloon[Clare]_SC_010 |
| CL-N68-004.00 | No; ca. ca. 10.8km d/s of bridge | Liscasey | Owenslieve_SC_010 |
| KY-N69-004.00 | No; ca. 10.6km d/s of bridge | Knocknacaska | Brick_SC_010 |
| KY-N69-005.00 | No; ca. 10.2km d/s of bridge | Farran 23 | Brick_SC_010 |
| KY-N69-006.00 | No; ca. 10.3km d/s of bridge | Fahavane | Brick_SC_010 |
| KY-N69-013.00 | No; ca. 4.7km d/s of bridge | Mountcoal 23 | Feale_SC_040 |
| KY-N69-018.00 | No; ca. 1km d/s of bridge | Skehanierin | Feale_SC_040 |
| KY-N69-019.00 | No; ca. 3.9km d/s of bridge | Cloonmackon | Galey_SC_010 |
| KY-N69-022.00 | No; ca. 1.5km d/s of bridge | Cuss | Galey_SC_020 |
| KY-N69-024.00 | No; ca. 6.6km d/s of bridge | Tyshe 23 | Galey_SC_020 |
| LC-N20-003.00 | No; ca.28km d/s of bridge | Maigue | Maigue_SC_010 |
| LC-N21-001.00 | No; ca. 70m d/s of bridge | Flows to Feale | Feale_SC_020 |
| LC-N21-001.40 | No; ca. 500m d/s of bridge | Dromtrasna | Feale_SC_020 |
| LC-N24-011.00 | No; ca. 3.7km d/s of bridge | Groody | Shannon[Lower]_SC_090 |
| LC-N69-012.00 | No; ca. 1.1km d/s of bridge | Barnakyle | Ballynaclogh_SC_010 |
| TS-N24-003.00 | No; ca. 0.1km d/s of bridge | Glen River | Suir_SC_160 |

**SCI Description**

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0] *
Sandbanks which are slightly covered by sea water all the time [1110]
Estuaries [1130]
Mudflats and sandflats not covered by seawater at low tide [1140]
Coastal lagoons [1150] *
Large shallow inlets and bays [1160]
Reefs [1170]
Perennial vegetation of stony banks [1220]
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
Salicornia and other annuals colonising mud and sand [1310]
Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]
Mediterranean salt meadows *(Juncetalia maritimi)* [1410]
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]
Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)* [6410]
[redacted]
Sea Lamprey *(Petromyzon marinus)* [1095]
Brook Lamprey *(Lampetra planeri)* [1096]
River Lamprey *(Lampetra fluviatilis)* [1099]
Salmon *(Salmo salar)* [1106]
Bottlenose Dolphin *(Tursiops truncatus)* [1349]
Otter *(Lutra lutra)* [1355]

* indicates a priority habitat under the Habitats Directive

| Lower River Suir SAC (002137) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| TS-N24-006.00 | Within | Flows to Suir | Suir_SC_150 |
| TS-N24-003.00 | No; ca. 0.1km d/s of bridge | Glen River | Suir_SC_160 |

**SCI Description**

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *
Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]
Mediterranean salt meadows *(Juncetalia maritimi)* [1410]
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
*Taxus baccata* woods of the British Isles [91J0]
[redacted]
White-Clawed Crayfish *(Austropotamobius pallipes)* [1092]
Sea Lamprey *(Petromyzon marinus)* [1095]
Brook Lamprey *(Lampetra planeri)* [1096]
River Lamprey *(Lampetra fluviatilis)* [1099]
Twaite Shad *(Alosa fallax fallax)* [1103]
Salmon (Salmo salar) [1106]
Otter (Lutra lutra) [1355]

* indicates a priority habitat under the Habitats Directive

| Tralee Bay And Magharees Peninsula, West To Cloghane SAC (0002070) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N86-007.00 | Within | Annagh 23 | Lee[Tralee]_SC_010 |
| KY-N86-009.00 | No; ca. 430m d/s of bridge | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-012.00 | No; ca. 300m d/s of bridge | Non-EPA | Lee[Tralee]_SC_010 |
| KY-N86-013.00 | No; ca. 270m d/s of bridge | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-014.00 | No; ca. 250m d/s of bridge | Non-EPA | Lee[Tralee]_SC_010 |
| KY-N86-017.00 | No; ca. 300m d/s of bridge | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-018.00 | No; ca. 930m d/s of bridge | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-022.20 | No; ca. 1.1km d/s of bridge | Cappaclough_West | Owencashla_SC_010 |

**SCI Description**

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] *
Estuaries [1130]
Mudflats and sandflats not covered by seawater at low tide [1140]
Coastal lagoons [1150] *
Large shallow inlets and bays [1160]
Reefs [1170]
Annual vegetation of drift lines [1210]
Perennial vegetation of stony banks [1220]
Salicornia and other annuals colonising mud and sand [1310]
Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* [1330]
Mediterranean salt meadows *(Juncetalia maritimi)* [1410]
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] *
Dunes with *Salix repens* ssp. *argentea (Salicion arenariae)* [2170]
Humid dune slacks [2190]
*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
Otter *(Lutra lutra)* [1355]
Petalwort *(Petalophyllum ralfsii)* [1395]

* indicates a priority habitat under the Habitats Directive

## Blackwater Estuary SPA (004028)

| Structure ID | Within | Watercourse (Source EPA) | WFD Sub-Catchment |
|---|---|---|---|
| WC-N25-025.00 | Within | Tourig_SC_010 | Tourig |
| WC-N72-000.60 | No; ca. 19.5km d/s of bridge | Owbeg (Waterford) | Blackwater[Munster]_SC_130 |
| WC-N72-003.00 | No; ca. 16km d/s of bridge | Glennafallia 18 | Blackwater[Munster]_SC_140 |
| WC-N72-006.00 | No; ca. 23km d/s of bridge | Finisk | Finisk_SC_010 |

**SCI Description**

Wigeon *(Anas penelope)* [A050]
Golden Plover (*Pluvialis apricaria*) [A051]
Lapwing *(Vanellus vanellus)* [A142]
Dunlin *(Calidris alpina)* [A149]
Black-tailed Godwit *(Limosa limosa)* [A156]
Bar-tailed Godwit *(Limosa lapponica)* [A157]
Curlew *(Numenius arquata)* [A160]
Redshank *(Tringa totanus)* [A162]

## Castlemaine Harbour SPA (004029)

| Structure ID | Within | Watercourse (Source EPA) | WFD Sub-Catchment |
|---|---|---|---|
| KY-N70-016.00 | No; ca. 0.3km d/s of bridge | BALLINTLEAVE | Caragh_SC_010 |
| KY-N70-020.00 | No; ca. 2.8km d/s of bridge | CURRA | Caragh_SC_010 |

**SCI Description**

Red-throated Diver (*Gavia stellata)* [A001]
Cormorant (*Phalacrocorax carbo)* [A017]
Light-bellied Brent Goose *(Branta bernicla hrota)* [A046]
Wigeon (*Anas penelope)* [A050]
Mallard (*Anas platyrhynchos)* [A053]
Pintail (*Anas acuta)* [A054]
Scaup (*Aythya marila)* [A062]
Common Scoter (*Melanitta nigra)* [A065]
Oystercatcher (*Haematopus ostralegus)* [A130]
Ringed Plover (*Charadrius hiaticula)* [A137]
Sanderling (*Calidris alba)* [A144]
Bar-tailed Godwit (*Limosa lapponica)* [A157]
Redshank *(Tringa totanus)* [A162]
Greenshank *(Tringa nebularia)* [A164]
Turnstone (*Arenaria interpres)* [A169]
Chough (*Pyrrhocorax pyrrhocorax)* [A346]

## Dungarvan Harbour SPA (004032)

| Structure ID | Within | Watercourse (Source EPA) | WFD Sub-Catchment |
|---|---|---|---|
| WC-N25-016.00 | No; ca. 1.1km d/s of bridge | KNOCKAHAVAUN | Colligan_SC_010 |

**SCI Description**

Great Crested Grebe *(Podiceps cristatus)* [A005]
Light-bellied Brent Goose *(Branta bernicla hrota)* [A046]
Shelduck *(Tadorna tadorna)* [A048]
Red-breasted Merganser *(Mergus serrator*) [A069]
Oystercatcher *(Haematopus ostralegus)* [A130]
Golden Plover *(Pluvialis apricaria)* [A051]
Grey Plover *(Pluvialis squatarola)* [A141]
Lapwing *(Vanellus vanellus)* [A142]
Knot *(Calidris canutus)* [A143]
Dunlin *(Calidris alpina)* [A149]
Black-tailed Godwit *(Limosa limosa)* [A156]
Bar-tailed Godwit *(Limosa lapponica*) [A157]
Curlew *(Numenius arquata)* [A160]
Redshank *(Tringa totanus)* [A162]
Turnstone *(Arenaria interpres)* [A169]

## Killarney National Park SPA (004038)

| Structure ID | Within | Watercourse (Source EPA) | WFD Sub-Catchment |
|---|---|---|---|
| KY-N71-002.00 | Within | Cloghereen | Laune_SC_010 |
| KY-N71-003.00 | Within | Owengarriff (Kerry) | Laune_SC_010 |
| KY-N71-005.00 | Within | n.a. | n.a. |
| KY-N22-023.00 | ca. 13.5km d/s | Flesk [Kerry] | Flesk[Kerry]_SC_020 |
| KY-N22-027.00 | ca. 24.2km d/s | Flesk [Kerry] | Flesk[Kerry]_SC_010 |
| KY-N22-030.00 | > 30km d/s | Ford Currimeenavrick | Flesk[Kerry]_SC_010 |
| KY-N22-031.00 | > 30km d/s | Ford Currimeenavrick | Flesk[Kerry]_SC_010 |
| KY-N71-001.00 | ca. 2km d/s | Flesk [Kerry] | Laune_SC_010 |

**SCI Description**

Merlin (*Falco columbarius*) [A098]
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
Barnacle Goose *(Branta leucopsis)* [A045]
Ringed Plover *(Charadrius hiaticula)* [A137]
Sanderling *(Calidris alba)* [A144]
Purple Sandpiper *(Calidris maritima)* [A148]
Dunlin *(Calidris alpina)* [A149]
Turnstone *(Arenaria interpres)* [A169]

| Lough Derg (Shannon) SPA (004058) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| TN-N65-001.00 | Within | Lorrha Stream | LorrhaStream_SC_010 |
| TN-N52-002.00 | ca. 9km d/s | Nenagh | Nenagh_SC_020 |
| TN-N52-003.00 | ca. 9.2km d/s | Gortadalaun Stream | Nenagh_SC_020 |
| **SCI Description** | | | |
| Lesser Black-backed Gull *(Larus fuscus)* [A183]<br>Herring Gull *(Larus argentatus)* [A184]<br>Cormorant *(Phalacrocorax carbo)* [A017]<br>Tufted Duck *(Aythya fuligula)* [A061]<br>Goldeneye *(Bucephala clangula)* [A067] | | | |

| Mid-Clare Coast SPA (004182) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CL-N67-013.00 | No; ca. 300m d/s of the bridge | Non-Listed | KiltumperStream_SC_010 |
| **SCI Description** | | | |
| Cormorant (*Phalacrocorax carbo*) [A017]<br>Barnacle Goose (*Branta leucopsis*) [A045]<br>Ringed Plover (*Charadrius hiaticula*) [A137]<br>Sanderling (*Calidris alba*) [A144]<br>Purple Sandpiper (*Calidris maritima*) [A148]<br>Dunlin (*Calidris alpina*) [A149]<br>Turnstone (*Arenaria interpres*) [A169]<br>Wetland and Waterbirds [A999] | | | |

| River Shannon and River Fergus Estuaries SPA (004077) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| CL-N67-001.00 | ca. 0.07km d/s | Tonavoher | Cloon[Clare]_SC_010 |
| CL-N67-004.00 | No; ca. 1.5km d/s of bridge | Wood 27 | Wood_SC_010 |
| LC-N20-003.00 | ca. 38km d/s | Maigue | Maigue_SC_010 |
| LC-N24-011.00 | ca. 7.2km d/s | Groody | Shannon[Lower]_SC_090 |
| LC-N69-012.00 | ca. 1.7km d/s | Barnakyle | Ballynaclogh_SC_010 |
| **SCI Description** | | | |
| Cormorant (*Phalacrocorax carbo)* [A017]<br>Whooper Swan (*Cygnus cygnus)* [A038]<br>Light-bellied Brent Goose (*Branta bernicla hrota)* [A046]<br>Shelduck (*Tadorna tadorna)* [A048]<br>Wigeon (*Anas penelope)* [A050]<br>Teal (*Anas crecca*) [A052]<br>Pintail (*Anas acuta*) [A054]<br>Shoveler (*Anas clypeata)* [A056]<br>Scaup (*Aythya marila)* [A062]<br>Ringed Plover (*Charadrius hiaticula)* [A137]<br>Golden Plover (*Pluvialis apricaria)* [A051]<br>Grey Plover (*Pluvialis squatarola)* [A141]<br>Lapwing (*Vanellus vanellus)* [A142]<br>Knot (*Calidris canutus) [*A143]<br>Dunlin (*Calidris alpina)* [A149]<br>Black-tailed Godwit (*Limosa limosa)* [A156]<br>Bar-tailed Godwit (*Limosa lapponica)* [A157]<br>Curlew (*Numenius arquata)* [A160]<br>Redshank (*Tringa totanus)* [A162]<br>Greenshank (*Tringa nebularia)* [A164]<br>Black-headed Gull (*Chroicocephalus ridibundus)* [A179] | | | |

| Tralee Bay Complex SPA (004188) | | | |
|---|---|---|---|
| **Structure ID** | **Within** | **Watercourse (Source EPA)** | **WFD Sub-Catchment** |
| KY-N86-007.00 | Within | Annagh 23 | Lee[Tralee]_SC_010 |
| KY-N86-009.00 | ca. 0.1km d/s | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-012.00 | ca. 0.2km d/s | Non-EPA | Lee[Tralee]_SC_010 |
| KY-N86-013.00 | ca. 0.2km d/s | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-014.00 | ca. 0.2km d/s | Non-EPA | Lee[Tralee]_SC_010 |
| KY-N86-017.00 | ca. 0.3km d/s | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-018.00 | ca. 0.9km d/s | Undefined | Lee[Tralee]_SC_010 |
| KY-N86-022.20 | ca. 1.9km d/s | Cappaclough_West | Owencashla_SC_010 |
| **SCI Description** | | | |
| Whooper Swan (*Cygnus cygnus)* [A038]<br>Light-bellied Brent Goose (*Branta bernicla hrota)* [A046]<br>Shelduck (*Tadorna tadorna)* [A048]<br>Wigeon (*Anas penelope)* [A050]<br>Teal (*Anas crecca)* [A052]<br>Mallard (*Anas platyrhynchos)* [A053]<br>Pintail (*Anas acuta)* [A054]<br>Scaup (*Aythya marila)* [A062]<br>Oystercatcher (*Haematopus ostralegus)* [A130]<br>Ringed Plover (*Charadrius hiaticula)* [A137]<br>Golden Plover (*Pluvialis apricaria)*[A051]<br>Grey Plover (*Pluvialis squatarola)* [A141]<br>Lapwing (*Vanellus vanellus)* [A142]<br>Sanderling (*Calidris alba)* [A144]<br>Dunlin (*Calidris alpina)* [A149]<br>Black-tailed Godwit (*Limosa limosa)* [A156]<br>Bar-tailed Godwit (*Limosa lapponica)* [A157]<br>Curlew (*Numenius arquata)* [A160]<br>Redshank (*Tringa totanus)* [A162]<br>Turnstone (*Arenaria interpres)* [A169]<br>Black-headed Gull (*Chroicocephalus ridibundus)* [A179]<br>Common Gull (*Larus canus)* [A182] | | | |