Habitats Regulations Assessment

Report of Information to Inform an Appropriate Assessment:

718736-3000-R-018 SPAs

A5 Western Transport Corridor

August 2017

Produced for

Department for Infrastructure

Prepared by

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NOTE: TransportNI is now known as Department for Infrastructure (DfI) Roads and on 1st July 2017 Mouchel was rebranded under the parent company name of WSP.

Document Control Sheet

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1	1st Consultation Draft	S. Ireland	10/04/14	P. Reid	16/04/14	P. Reid	16/04/14
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3	3rd Consultation Draft	S. Ireland A.Bascombe	11/08/17	B. Walker	18/08/17	P. Edwards	18/08/17

[1] The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, as amended (the Habitats Regulations) indicate that the person or organisation applying for any consent, permission or other authorisation, known as the 'Project Proponent', is responsible for provision of information to support decisions by the 'Competent Authority' on the need for Appropriate Assessment and to allow the Appropriate Assessment to be undertaken. The 'Project Proponent' is taken to mean the project team, including as appropriate: Overseeing Organisation scheme or area staff; design consultants; contractors; Design Build Finance and Operate (DBFO) companies; and managing agents.

Distribution

Organisation	Contact	Copies
Department for Infrastructure	Seamus Keenan	1
NIEA	David Chambers	1
Development Applications Unit National Parks and Wildlife Service	Yvonne Nolan	1
RSPB	Michelle Hill	1
Public Consultation	22nd August – 2nd October	

Schedule of Changes

The following table outlines the updates made to the Report of Information to Inform Appropriate Assessment: SPAs, on receipt of comments received from consultation in April 2017.

Section Edited	Update
Throughout	Removal of references to Mouchel and TransportNI who are now known as WSP and Department for Infrastructure respectively
Document Control Sheet	Revision, Status, Record of Issue details
1.1.5 - 1.1.6	Detail on consultation process
1.3.4 - 1.3.6	Author and reviewer details updated
2.2.1	Guidance review detail
2.2.2 - 2.2.4	Stage 2 Appropriate Assessment details
2.2.9	'Test of Significance' detail
Table 2.1 - Table 2.3	Footnotes added
4.2.1	Consultation detail
4.2.4 – 4.2.5	Implications of Climate Change
4.3.4	Text removed
5.1.3	Figure number reference updated
7.1.3	Figure number reference updated and climate text added
7.1.7	Explanation of Figure
7.2.12	Habituation text updated
7.2.13	Alteration of running order

7.2.20 – 7.2.26 and 7.2.29	Alteration of running order
7.2.27 – 7.2.28	Details of working restrictions and watching brief
7.2.30 - 7.2.31	Details of working restrictions and watching brief
8.1.4	Conclusions - climate change and watching brief included
8.1.5	Updated text
Section 9	Two references added

Contents

Tables

1 Introduction

1.1.1 This document is a Habitats Regulation Assessment (HRA) which contains information to be submitted to the 'Competent Authority' in order to inform the statutory assessments required under the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended[2]), for the proposed A5 Western Transport Corridor (A5WTC) Scheme.

1.1.2 These regulations apply to European Natura 2000 sites[3], namely Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The Proposed Scheme would interact with the following sites, namely:

- River Foyle and Tributaries SAC
- River Finn (Republic of Ireland) SAC
- Owenkillew River SAC
- Tully Bog SAC
- Lough Swilly (including former Inch Lough and Levels) SPA
- Lough Foyle (Northern Ireland) SPA (and Ramsar site)
- Lough Foyle (Republic of Ireland) SPA (and Ramsar site)
- Lough Neagh and Lough Beg SPA (and Ramsar site)

1.1.3 This document (HRA – SPAs) is one of four assessments, and specifically addresses the SPAs (Lough Foyle SPA (NI and RoI); Lough Swilly SPA and Lough Neagh and Lough Beg SPA).

1.1.4 A further three documents have been produced, namely:

[2] As amended by the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2012

[3] Natura 2000 sites consist of Special Areas of Conservation (SACs) designated under European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') and Special Protection Areas (SPAs) designated under Directive 2009/147/EC, (the codified version of 79/409/EEC as amended) on the conservation of wild birds (the 'Birds Directive.')

- HRA Report - Tully Bog SAC
- HRA Report – Watercourse SACs (for River Foyle & Tributaries SAC, River Finn SAC and Owenkillew SAC); and
- Ramsar Site Assessment Report[4] (for Lough Foyle Ramsar Sites (NI and RoI); and Lough Neagh and Lough Beg Ramsar Site.

1.1.5 A first draft of this report was published for consultation in 2014 and responses were received at that time. The content of those responses, and any design changes which arose from the 2016 Public Inquiry of the Scheme, were taken into account in developing a second draft report, which was published for consultation in April 2017 in which the general public were also invited to provide responses[5].

1.1.6 Comments from the Department of Agriculture, Environment, and Rural Affairs (DAERA) as statutory consultee for the designated sites in Northern Ireland, The Loughs Agency (as a statutory consultee for both NI and the Republic of Ireland), The Northern Ireland Environmental Agency (NIEA), RSPB, as well as information and relevant comments received from the public, have been used to inform this third draft Consultation report. Inland Fisheries and the National Parks and Wildlife Service were directly consulted for the 2nd consultation and these organisations confirmed they had no comments on the report. Any comments received from this third round of consultation will then be incorporated in a final report to be considered by Department for Infrastructure (DfI) and the Minister when undertaking the Appropriate Assessment required in advance of a decision to proceed or not with the Scheme, in accordance with the requirements of the Directive and Regulations.

1.2 Background

1.2.1 The A5 Western Transport Corridor (A5WTC) is one of five key transport corridors making up the strategic road network across Northern Ireland. The Department for Infrastructure (DfI) is promoting the dualling of the A5WTC as part of its improvement programme. This project would significantly improve safety and journey times along this route and, in addition to improving the links between the urban centres in the west of the Province, provide a strategic

[4] Ramsar sites are not referred to under the Directives or their transposition into UK and ROI Regulations. However, Planning Policy Statement 2 (PPS2) in Northern Ireland applies the same level of consideration and protection to them as to Natura 2000 sites

[5] The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (to which the UK is a signatory) requires [at Article 3]:- '*Each Party shall promote environmental education and environmental awareness among the public, especially on how to obtain access to information, to participate in decision-making and to obtain access to justice in environmental matters'.*

link with international gateways. At the border with the Republic of Ireland it will connect with the N2 route which the Irish Government also has longer term plans to upgrade. It passes through New Buildings, Strabane, Sion Mills, Newtownstewart, Omagh and Aughnacloy.

1.2.2 The proposed new A5WTC dual carriageway runs for some 85km between the existing A5 north of New Buildings and the existing A5 south of Aughnacloy. The proposal will ultimately link up with an allied proposal in the Republic of Ireland, however as that proposal has not progressed to any meaningful stage which allows assessment, the current documents provide comprehensive assessments of the foreseeable proposals designed to date.

1.2.3 It is anticipated the construction of the proposed scheme will be undertaken in three phases as follows, and shown on Appendix 1 - Sheets 1 to 24:

- construction of junctions 1-3 (New Buildings – Strabane North) and junctions 13-15 (Omagh South – A4,Ballygawley) between 2017 and 2019;
- construction of junctions 3-13 (Strabane North – Omagh South) between 2021 and 2023; and
- construction of junction 15 (A4,Ballygawley) to the A5 south of Aughnacloy between 2026 and 2028.

1.2.4 The currently proposed A5WTC Scheme substantially reflects a previous proposal which was promoted in 2010 and for which an Environmental Statement (A5WTC ES 2010) was prepared and published. The environmental studies reported in the A5WTC ES 2010 were informed by a draft Habitats Regulations Assessment (HRA) which recognised and screened[6] the above European Designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) for likely significant effects. A judicial review of the scheme in 2013 found the ES to be

[6] The SACs and SPAs were subject to a screening exercise (Test of Likely Significance (ToLS) to determine if the proposed scheme, with its proposed and committed mitigation measures, would be likely to have a significant effect on the integrity of any of the sites considered. The ToLS process is commonly referred to as Stage 1 of the Habitats Regulations Assessment (HRA) process. When completed, the ToLS concluded the impacts of the proposed scheme (subject to mitigation) would not be likely to have a significant effect upon the integrity of the implicated designated sites in the context of the Habitats or Birds Directives, a conclusion which was agreed with by Northern Ireland Environment Agency (NIEA), the statutory consultee relative to the designated sites in Northern Ireland and the National Parks and Wildlife Service (NPWS) the organisation charged with the implementation of the Habitats and Birds Directives in the ROI.

robust, but upheld a challenge that the HRA reporting relating to the Habitats Regulations should have been taken to the next level, namely a Stage 2 assessment[7].

1.2.5 Further studies have since been completed to address this need for a more robust HRA, and a new Environmental Statement (A5WTC ES 2016) was prepared and published based on this information.

1.2.6 The 2016 Environmental Statement (ES), along with the draft vesting orders and other statutory procedures, were subject to a Public Inquiry from October to December 2016. Accordingly, the production of the current suite of HRA Reports have been programmed to ensure they contain the most up to date information.

1.3 Preparation of the HRA

1.3.1 The primary author of this report is Stuart Ireland B.Sc. (Hons), MCIEEM, CEnv. He is expert in ecological matters and the full spectrum of environmental assessment techniques, methodologies and statutes. Academically, he holds a combined honours degree in Zoology with Marine Zoology from UCNW Bangor, and professionally, is a member of relevant Institutes requiring the highest standards of professional competence and integrity. He is a Chartered Environmentalist, and a full member of the Chartered Institute of Ecology and Environmental Management.

1.3.2 Stuart has practised for 17 years, during which time he has undertaken complex Ecological Impact assessments, Habitats Regulations Assessments for nationally important infrastructure schemes. He has been involved with the A5WTC proposal since its inception in 2008 and is familiar with both the proposal site and the full spectrum of environmental parameters which have influenced the design of the proposal.

1.3.3 Stuart has provided ecological advice services for major road schemes, including the Roscommon Way Extension scheme in Essex, ensuring that construction of a flood relief road through a SSSI was undertaken in a manner which preserved the ecological function of the site and its supported species. He has appeared as an Expert Witness on ecological matters and has significant experience in Habitat Regulations Assessments, including working with

[7] The challenge to the consent for the proposed scheme was made in the context that potential impacts upon the River Foyle and Tributaries SAC should have been subject to Stage 2 of the Habitats Regulations Assessment (Appropriate Assessment). This challenge was upheld. The finding was informed by concerns raised by Loughs Agency in responses to the 2010 ES and presented in verbal submissions to the public inquiries held in 2011 concerning the protection of Atlantic salmon (*Salmo salar*), and clarifications through case law relative to the interpretation of 'likelihood' in the context of screening for likely significant effects as referred to in the Habitats Directive and the Regulations.

clients, contractors and Statutory Consultees to design schemes to ensure protection of Natura 2000 sites and their conservation objectives.

1.3.4 Stuart has been assisted by Andy Bascombe, BSC (Hons), MSc, PhD, CEnv, CSci. Andy is a Technical Director at WSP with specific responsibility for ecology, with over 25 years of experience in environmental consultancy. He holds a BSc in Biological Sciences from Leicester University, an MSc in Ecology from UCNW Bangor, and a PhD in Applied Ecology from Middlesex Polytechnic. He is a Chartered Scientist and a Chartered Environmentalist and a full member of both the Chartered Institute of Ecology and Environmental Management and the Chartered Institution of Water and Environmental Management.

1.3.5 Andy has worked on a wide range of projects in the UK and overseas for public and private sector clients, local planning authorities, government departments and other bodies, providing ecological and environmental advice at all stages of developments. He is an experienced project manager who has been responsible for environmental aspects of major developments, and has managed Environmental Statements and EIAs produced for planning applications, undertaken specialist studies including numerous Habitats Regulations Assessments and Appropriate Assessments. He has given expert witness evidence at several Public Inquiries, and has a thorough appreciation of the requirements of all stages of development having worked on projects from conceptual design through to post-construction monitoring.

1.3.6 The assessment was also reviewed and added to by Dr James O'Neill, Dr Gen Cannibal (2nd Consultation Draft) and Beverley Walker (3rd Consultation Draft) of Mabbett Associates.

2 HRA Process

2.1 Objectives

2.1.1 The overall aims of the Habitats and Birds Directives are to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives, and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the best examples of them. European and national legislation places a collective obligation on its member states and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation status.

2.1.2 The maintenance of habitats and species within Natura 2000 sites at favourable conservation status will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

2.1.3 Favourable conservation status of a site is achieved when:

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

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

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

2.1.5 The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. Accordingly, recognition of the importance of the identified designated sites within the Scheme study area and undertaking habitats assessment appraisals has been ongoing, and has occurred iteratively throughout the development of the A5WTC Scheme, and has significantly influenced the Scheme design.

2.1.6 In the first instance, the Scheme has aimed to avoid any negative impacts on European sites by identifying possible impacts early in the development of the Scheme, and has avoided sites as much as possible during the corridor and route options appraisal.

2.1.7 Following that, mitigation measures have been applied where necessary, with the aim of ensuring that no significant adverse impacts on the Sites remain.

2.1.8 The purpose of this report is to provide information on the likely significant effects of the Scheme on the qualifying features of the respective designated sites, identify the mitigation measures proposed, and to assess whether the mitigation measures will ensure that the favourable conservation status of the each of the Sites is maintained.

2.2 Approach to Habitat Regulations Assessment

2.2.1 The gathering and presentation of the information in this document has been informed by the guidance provided in 'Managing Natura 2000 Sites, the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2000 & 2001)', and 'Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC'. Further useful guidance is provided by Section 4, Part 1 of Volume 11 of the DMRB (HD44/09). EU Guidance on Climate Change and Biodiversity (2013) was reviewed. In accordance with the guidance, a staged approach is taken to the assessment of plans and projects under the Habitat Regulations:

Stage 1: Screening/Test of Likely Significance

2.2.2 This is where it is established if an appropriate assessment is required and is referred to as 'screening'. Its purpose is to identify the likely impacts upon a Natura 2000 Site of a project or a plan, either alone or in combination with other plans or projects and considers whether these impacts are likely to be significant. It will include:

- A description of the project;
- Identification of relevant Natura 2000 sites potentially affected;
- Identification and description of individual and cumulative impacts likely to result from implementation of the project;
- Assessment of the significance of the impacts identified above on site integrity; and
- Exclusion of sites where it can be objectively concluded that there will be no significant effects.

Stage 2: Appropriate Assessment

2.2.3 Should Stage 1 determine that there is a 'likelihood' of an effect on the qualifying features of a site, or that any significant effects cannot be ruled out, then the assessment proceeds to Stage 2. This stage considers the potential impacts on the structure and function (**integrity**), as well as the **conservation objectives** of the Natura 2000 Sites that the Proposal may have either alone or in combination with other projects or plans. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts is presented. This stage includes:

- A description of the Natura 2000 sites that will be considered further in the AA;

- A description of the likely impacts on the conservation objectives of the site, and an assessment of their significance;
- Mitigation Measures; and
- Conclusions.

2.2.4 If it cannot be ruled out that no significant adverse effects will occur on a site's conservation objectives, then the assessment proceeds to Stages 3 and 4.

Stage 3: Assessment of alternative solutions

2.2.5 This process examines alternative ways of achieving the objectives of the Proposal that avoid adverse impacts on the integrity of the Natura 2000 sites.

Stage 4: Imperative reasons of overriding public interest

2.2.6 This stage is the main reason of exemption from Article 6(4) which examines whether there are imperative reasons of overriding public interest (IROPI), and where no alternative solutions exist, for allowing a plan or project which will have adverse effects on the integrity of a Natura 2000 site to proceed.

2.2.7 This Report addresses Stage 1 and Stage 2 of the HRA Process.

Note: For the purposes of this assessment, the term 'likely' is applied within the proper meaning of the term as defined in the corpus of EU environmental law. In that sense, a 'likely' significant effect is deemed herein to be not one which is more likely than not to occur, but rather one with a genuine possibility of occurrence, no matter how small that likelihood may be. That being so, the precautionary principle required in HRA is integrated into the very heart of the assessment methodology and the assessment is thus as robust as possible.

2.2.8 The definition for 'integrity' adopted in this report is that provided in ODPM Circular 06/2005 and Defra Circular 01/2005 - *Biodiversity and Geological conservation – Statutory obligations and their impact within the planning system*, which defines integrity in the context of designated sites as:

The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.

2.2.9 The test of 'significance' is where a plan or project could undermine the site's conservation objectives. The assessment of that risk (of 'significance') must be made in the light, amongst other things, of the characteristics and specific environmental conditions of the site concerned.

3 Stage 1 – Screening

3.1.1 As discussed above, the first stage of an HRA assessment is to consider whether a project could cause 'likely significant effect' on the qualifying features of the Natura 2000 site(s), alone or in-combination with other plans/projects. In line with EU Guidance, and the Design Manual for Roads & Bridges (DMRB) method of assessment, screening matrices were completed for each of the potentially affected Natura 2000 sites in 2013. Tables 2.1 to 2.3 provide this information and are supported by reference to the A5WTC ES 2010 (and the A5WTC ES 2016 where appropriate).

Table 2.1 Screening Matrix for Lough Foyle SPA

Table 2.1 DMRB Screening Matric for Lough Foyle SPA		
Project Name:	A5 WTC	
Natura 2000 Site under Consideration:	Lough Foyle SPA	
Date:	Author (Name/Organisation):	Verified (Name/Organisation):
23/07/13	S.Ireland, Mouchel (now WSP)	P. Reid, Mouchel (now WSP)
Description of Project The proposed 85km A5 Western Transport Corridor (A5 WTC) scheme forms part of a strategically important transport route between Londonderry/Derry in Northern Ireland (NI) and to Dublin in the Republic of Ireland (ROI). The proposed scheme involves replacement of the existing A5 from a point north of New Buildings Londonderry in the north to a point south of Aughnacloy in the south with a dual carriageway along an alignment off-line from the existing road. In NI the existing road passes through New Buildings, Strabane, Sion Mills, Newtownstewart, Omagh and Aughnacloy. The proposed scheme will cross the River Foyle and Tributaries SAC in 2 locations and be close to the designated site in a number of other locations. It is anticipated the proposed scheme will be built in three phases starting with Phase 1 to commence in 2017, Phase 2 in 2022 and Phase 3 in 2026. It is anticipated that each phase will take some 2 to 3 years to construct.		
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale *(road type and probable traffic volume)*	The project involves the construction of an 85 km long dual carriageway involving construction within the Foyle floodplain in an area known to support birds associated with the SPA, with associated drainage and local road improvements. Traffic volumes are anticipated to be a maximum of 23300 AADT (to the nearest 100) by 2040. There will be no direct impacts on the SPA. However, both construction and operation of the road could lead to impacts on key foraging areas outside of the SPA and on birds foraging within these areas.	
Land-take	There will be no land take within the SPA. Approximately 40 ha of land within the area of the Foyle floodplain known to support birds associated with the SPA will be lost to the scheme.	

Distance from the European Site or key features of the site *(from edge of the project assessment corridor)*	The proposed scheme is located approximately 10km south of Lough Foyle SPA. Nevertheless birds which are known to use the SPA and which are designation feature species of the SPA are known to utilise an area of the Foyle floodplain partially encompassed within the project corridor during the winter months between Magheramason and the Burn Dennett crossing. In this location the proposed scheme varies between 0.3km and 1.8km from the River Foyle, running initially to the west of the existing A5, crossing to east of the existing A5 north of Bready and crossing back to west of the existing A5 just south of Grangefoyle Road.
Resource requirements *(from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)*	None.
Emissions *(e.g. polluted surface water runoff* *both soluble and insoluble pollutants, atmospheric pollution)*	The SPA is some 10km north and downstream of the proposed works at its closest point. Emissions from the scheme, including run-off from construction and operation, and vehicle emissions are not likely to interact with the SPA.
Excavation requirements *(e.g. impacts of local hydrogeology)*	None.
Transportation requirements	Construction related traffic and operational use of the scheme may result in potential disturbance impacts upon whooper swan foraging outside of the SPA boundary.
Duration of construction, operation, etc.	The construction of the northern section of Phase 1 of the proposed scheme will take 2-3 years. Phase 2 and 3 are outside of the possible area of interaction with the SPA species.
Other	None.
Description of avoidance and/or mitigation measures *Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:*	
Nature of proposals	At present the operational requirements of the construction are not finalised, therefore potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Location	Any mitigation relevant to the designation feature species of the Lough Foyle SPA is likely to be restricted to the eastern Foyle floodplain in areas utilised by the relevant bird populations.
Evidence for effectiveness	Potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	Transport NI will place contractual obligations on contractors to provide all necessary mitigation identified in Stage 2 of the assessment. Environmental Representatives employed by Transport NI will monitor the proposed scheme throughout construction.

Characteristics of European Site(s) *A brief description of the European Site should be produced, including information on:*	
Name of European Site and its EU code	Lough Foyle SPA UK9020031 (including the designated section of Lough Foyle located within the ROI (between Muff and Whitecastle) Foyle SPA (site code 004087)).
Location and distance of the European Site from the proposed works	The proposed scheme is located approximately 10km south of Lough Foyle SPA.
European Site size	2204.36 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	The SPA supports populations of European importance of bar-tailed godwit (1,896 individuals, representing 10.8% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6)), whooper swan (890 individuals, representing 8.9% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6)) and light-bellied brent goose (3730 individuals, representing 18.7% of the wintering population in Ireland (5 year peak mean 1991/2 - 1995/6)). The site also regularly supports at least 20,000 waterfowl (and thereby qualifying as a wetland of international importance).
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	Although a control programme has begun, the colonisation and spread of aggressive non-native species, such as *Spartina spp*. is a current problem and poses a potential threat in the future (JNCC website).
European Site conservation objectives – where these are readily available	Maintain all features in a favourable condition.[8,9]
Assessment Criteria *Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.*	
<u>Potential Impacts on whooper swan</u> The scheme has the potential to give rise to effects on whooper swan associated with this SPA through disturbance and habitat loss outside of the designated site which could lead to a reduction in the populations of birds which form the designation features of the SPA. Mitigation proposals for the construction phase cannot be confirmed at this point, therefore, there remains a potential for significant effects.	

[8] Features refers to the selection features for the SPA.

[9] Individual objectives are set for each feature, they are too numerous to present in this table and are presented in Appendix 2, Table A2.1.

Potential Impacts on light-bellied brent geese No light-bellied brent geese were recorded within the area of potential interaction between the proposed works and habitats supporting designation feature species. Significant effects, upon the species are unlikely. Potential Impacts on bar-tailed godwit No bar-tailed godwit were recorded within the area of potential interaction between the proposed works and habitats supporting designation feature species. Significant effects, upon the species are unlikely.	
Initial Assessment *The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.* *Describe any likely changes to the site arising as a result of:*	
Reduction of habitat area	None.
Disturbance to key species	The scheme may cause a significant effect on whooper swan due to disturbance.
Habitat or species fragmentation	The scheme is unlikely to cause a significant effect to whooper swan due to fragmentation since all sites currently used by the designation species will remain available
Reduction in species density	The scheme may cause a reduction in species density if the disturbance of foraging birds is sufficient to cause desertion of the Foyle floodplain adjacent to the works by some or all of the designation species population that currently use it.
Changes in key indicators of conservation value (water quality, etc.)	The scheme is unlikely to result in changes in key indicators of conservation value as sufficient mitigation is in place.
Climate change	The scheme has the potential to contribute to the problem of climate change by increasing the carrying capacity of the current road network[10].
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	None.
Interference with key relationships that define the function of the site	Possible disturbance of whooper swans on grazing areas outside of the site could cause birds to lose foraging time, and expend energy avoiding the disturbance. Thus reducing the birds' fitness and ability to survive and impacting on the function of the site as winter bird habitat.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	No habitat loss within the SPA. Approximately 40ha of potential foraging habitat loss west of the existing A5, although no whooper swan have been recorded under the scheme footprint.

[10] New UK Policy has placed a ban on the sale of new petrol and diesel vehicles from 2040, which will result in a decrease in traffic related CCG emissions.

Disturbance to key species	There could be a significant effect subject to mitigation.
Habitat or species fragmentation	Unlikely to be a significant effect as all foraging habitat utilised by whooper swan will remain.
Loss	The project will not cause direct loss of whooper swan. Should disturbance be significant enough to cause abandonment of the preferred grazing areas there could be indirect mortality of whooper swan.
Disruption	No disruption of the SPA will occur. However, potential exists for disturbance during construction and operation to disrupt the natural foraging/roosting site interactions of whooper swan. This could have a significant effect on the SPA.
Change to key elements of the site *(e.g. water quality, hydrological regime etc.)*	Not significant.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	
Outcome of screening stage (delete as appropriate).	Significant effect possible on whooper swan.
Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attach relevant correspondence).	**YES**

Table 2.2 Screening Matrix for Lough Swilly SPA

Table 2.2 DMRB Screening Matrix for Lough Swilly SPA		
Project Name:	A5 WTC	
Natura 2000 Site under Consideration:	Lough Swilly SPA	
Date:	Author (Name/Organisation):	Verified (Name/Organisation):
23/07/13	S.Ireland, Mouchel (now WSP)	P. Reid, Mouchel (now WSP)
Description of Project The proposed 85km A5 Western Transport Corridor (A5 WTC) scheme forms part of a strategically important transport route between Londonderry/Derry in Northern Ireland (NI) and to Dublin in the Republic of Ireland (ROI). The proposed scheme involves replacement of the existing A5 from a point north of New Buildings Londonderry in the north to a point south of Aughnacloy in the south with a dual carriageway along an alignment off-line from the existing road. In NI the existing road passes through New Buildings, Strabane, Sion Mills, Newtownstewart, Omagh and Aughnacloy. The proposed scheme will cross the River Foyle and Tributaries SAC in 2 locations and be close to the designated site in a number of other locations. It is anticipated the proposed scheme will be built in three phases starting with Phase 1 to commence in 2017, Phase 2 in 2022 and Phase 3 in 2026. It is anticipated that each phase will take some 2 to 3 years to construct.		
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale *(road type and probable traffic volume)*	The project involves the construction of an 85 km long dual carriageway involving the construction within the Foyle floodplain in an area known to support birds associated with the SPA, with associated drainage and local road improvements. Traffic volumes are anticipated to be a maximum of 23300 AADT (to the nearest 100) by 2040. There will be no direct impacts on the SPA. However, both construction and operation of the road could lead to impacts on key foraging areas outside of the SPA and on birds foraging within these areas.	
Land-take	There will be no land take within the SPA. Approximately 40 ha of land within the area of the Foyle floodplain known to support birds associated with the SPA will be lost to the scheme.	
Distance from the European Site or key features of the site *(from edge of the project assessment corridor)*	The proposed scheme is located approximately 12km east/south-east of Lough Swilly SPA. Nevertheless birds which are known to use the SPA and which are designation feature species of the SPA are known to utilise an area of the Foyle floodplain partially encompassed within the project corridor during the winter months between Magheramason and the Burn Dennett crossing. In this location the proposed scheme varies between 0.3km and 1.8km from the River Foyle, running initially to the west of the existing A5, crossing to east of the existing A5 north of Bready and crossing back to west of the existing A5 just south of Grangefoyle Road.	
Resource requirements *(from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)*	None.	

Emissions *(e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)*	The SPA is some 12km west/north-west of the proposed works at its closest point. There is no direct hydrological link to the SPA from the proposed works corridor. Emissions from the scheme, including run-off from construction and operation, and vehicle emissions are not likely to interact with the SPA.
Excavation requirements *(e.g. impacts of local hydrogeology)*	None.
Transportation requirements	Construction related traffic and operational use of the scheme may result in potential disturbance impacts upon whooper swan foraging outside of the SPA boundary[11].
Duration of construction, operation, etc.	The construction of the northern section of Phase 1 of the proposed scheme will take 2-3 years. Phase 2 and 3 are outside of the possible area of interaction with the SPA species.
Other	None.
Description of avoidance and/or mitigation measures *Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:*	
Nature of proposals	At present the operational requirements of the construction are not finalised, therefore potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Location	Any mitigation relevant to the qualifying features of the Lough Swilly SPA is likely to be restricted to the eastern Foyle floodplain in areas utilised by the relevant bird populations.
Evidence for effectiveness	Potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	Transport NI will place contractual obligations on contractors to provide all necessary mitigation identified in Stage 2 of the assessment. Environmental Representatives employed by Transport NI will monitor the proposed scheme throughout construction.
Characteristics of European Site(s) *A brief description of the European Site should be produced, including information on:*	
Name of European Site and its EU code	Lough Swilly SPA (Site Code IE004075)

[11] Since the 2013 screening, further consultee advice has resulted in the inclusion of greylag goose as a consideration when assessing disturbance effects outside the SPA boundary. This has been undertaken as part of the Stage 2 assessment below.

Location and distance of the European Site from the proposed works	The proposed scheme is located approximately 12km to the east/south-east of the closest extent of the Lough Swilly SPA.
European Site size	The site comprises the inner part of Lough Swilly and extends from just south of Letterkenny north to Rathmullan. With the subsumed Inch Lough and Levels SPA the complex is approximately 82.6km^2 in size.
Key features of the European Site including the primary reasons for selection and any other qualifying interests	The SPA supports internationally important wintering populations of Greenland white-fronted geese (5 year mean of winter maximum 1995/96-1999/00 of 970 individuals), whooper swans (5 year mean of winter maximum 1995/96- 1999/00 was 1,135 individuals, the largest population in the country) and greylag geese (5 year mean of winter maximum 1995/96-1999/900 was 2,020 individuals - incorporating both migratory birds of the Icelandic population and smaller numbers of feral birds). In the three winters 1995/96 to 1999/2000, 18 species occurred in nationally important numbers as follows (figures are average maximum counts for the 3 winters): Great Crested Grebe (284), Grey Heron (57), Shelduck (772), Wigeon (1,580), Teal (1,581), Mallard (1,169), Shoveler (60), Scaup (103), Goldeneye (170), Red-breasted Merganser (127), Coot (514), Oystercatcher (1,595), Knot (303), Dunlin (7,285), Curlew (1,720), Redshank (1,404), Greenshank (48) and Common Gull (1,523). Other species which occur include Light-bellied Brent Goose (152), Pochard (102), Golden Plover (749), Lapwing (1,408), Ringed Plover (81), Grey Plover (15), Bar-tailed Godwit (139) and Turnstone (73). The site is an important area for Great Northern Diver (19) and the rare Slavonian Grebe (11). The rare winter visitor, Pink-footed Goose, also occurs (15). Nationally important numbers of Mute Swan (265) also use the site. Inch Lough supports the largest tern colony in the north-west, with nationally important populations of Sandwich Tern (258 pairs in 2001) and Common Tern (89 pairs in 2001) occurring. There is also a nationally important colony of Black-headed Gull (800 pairs in 2001), which represents one of the largest populations in the country. The site is regularly used by in excess of 20,000 waterfowl and therefore qualifies as of international importance. Other species of note using the site are: herring gull and little grebe. The site is also used by Irish hare.
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	The maintenance of the high numbers of geese and swans is dependent on the continuation of favourable land-use practices on the polders. The principal commercial activity within the estuarine part of the site is aquaculture. It is not known if this is causing significant disturbance to the estuarine habitats or the bird populations. Despite the proximity of several towns, water quality is generally satisfactory. Recreational activities occur in several areas of site and could cause some disturbance to the birds if not properly controlled.
European Site conservation objectives – where these are readily available	Objective 1: To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Lough Swilly SPA. Objective 2: To maintain the favourable conservation condition of the wetland habitat at Lough Swilly SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Assessment Criteria *Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.*	
Potential Impacts upon whooper swan The scheme has the potential to give rise to effects on whooper swan associated with this SPA through disturbance and habitat loss outside of the designated site. Mitigation proposals for the construction phase cannot be confirmed at this point, therefore, there remains a potential for significant effects. Potential Impacts upon greylag geese The scheme has the potential to give rise to effects on greylag geese associated with this SPA through disturbance and habitat loss outside of the designated site. Mitigation proposals for the construction phase cannot be confirmed at this point, therefore, there remains a potential for significant effects. Potential Impacts upon Greenland white-fronted geese No Greenland white fronted geese were recorded within the area of potential interaction between the proposed works and habitats supporting SPA qualifying species. Significant effects, upon the species are unlikely. Potential Impacts on other designation feature species A few individuals of other designation feature species have been recorded on the River Foyle. No significant effects are predicted for these species.	
Initial Assessment *The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.* *Describe any likely changes to the site arising as a result of:*	
Reduction of habitat area	None.
Disturbance to key species	The scheme may cause a significant effect on whooper swan and/or greylag geese due to disturbance.
Habitat or species fragmentation	The scheme is unlikely to cause a significant effect to whooper swan or greylag geese due to fragmentation since all sites currently used by the designation species will remain available
Reduction in species density	The scheme may cause a reduction in species density if the disturbance of foraging birds is sufficient to cause desertion of the Foyle floodplain adjacent to the works by some or all of the designation species population that currently use it.
Changes in key indicators of conservation value (water quality, etc.)	The scheme is unlikely to result in changes in key indicators of conservation value as sufficient mitigation is in place.
Climate change	The scheme has the potential to contribute to the problem of climate change by increasing the carrying capacity of the current road network[12].

[12] *Ibid* footnote 10

Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	None.
Interference with key relationships that define the function of the site	Possible disturbance of whooper swans and/or greylag geese on grazing areas outside of the site could cause birds to lose foraging time, and expend energy avoiding the disturbance. Thus reducing the birds' fitness and ability to survive and impacting on the function of the site as winter bird habitat.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	No habitat loss within the SPA. Approximately 40ha of potential foraging habitat loss west of the existing A5, although no whooper swan or greylag geese have been recorded under the scheme footprint.
Disturbance to key species	There could be a significant effect subject to mitigation.
Habitat or species fragmentation	Unlikely to be a significant effect as all foraging habitat utilised by whooper swan will remain.
Loss	The project will not cause direct loss of whooper swan. Should disturbance be significant enough to cause abandonment of the preferred grazing areas there could be indirect mortality of whooper swan and/or greylag geese.
Disruption	No disruption of the SPA will occur. However, potential exists for disturbance during construction and operation to disrupt the natural foraging/roosting site interactions of whooper swan and/or greylag geese. This could have a significant effect on the SPA.
Change to key elements of the site *(e.g. water quality, hydrological regime etc.)*	Not significant.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	
Outcome of screening stage (delete as appropriate).	Significant effect possible on whooper swan and greylag geese.
Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attach relevant correspondence).	**YES**

Table 2.3 Screening Matrix for Lough Neagh & Lough Beg SPA

Table 2.3 DMRB Screening Matrix for Lough Neagh & Lough Beg SPA		
Project Name:	A5WTC	
Natura 2000 Site under Consideration:	Lough Neagh & Lough Beg SPA	
Date:	Author (Name/Organisation):	Verified (Name/Organisation):
23/07/13	S.Ireland, Mouchel (now WSP)	P. Reid, Mouchel (now WSP)
Description of Project The proposed 85km A5 Western Transport Corridor (A5 WTC) scheme forms part of a strategically important transport route between Londonderry/Derry in Northern Ireland (NI) and to Dublin in the Republic of Ireland (ROI). The proposed scheme involves replacement of the existing A5 from a point north of New Buildings Londonderry in the north to a point south of Aughnacloy in the south with a dual carriageway along an alignment off-line from the existing road. In NI the existing road passes through New Buildings, Strabane, Sion Mills, Newtownstewart, Omagh and Aughnacloy. The proposed scheme will cross the River Foyle and Tributaries SAC in 2 locations and be close to the designated site in a number of other locations. It is anticipated the proposed scheme will be built in three phases starting with Phase 1 to commence in 2017, Phase 2 in 2022 and Phase 3 in 2026. It is anticipated that each phase will take some 2 to 3 years to construct.		
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale *(road type and probable traffic volume)*	The project involves the construction of an 85 km long dual carriageway involving construction within the Foyle floodplain in an area known to support birds associated with the SPA, with associated drainage and local road improvements. Traffic volumes are anticipated to be a maximum of 23300 AADT (to the nearest 100) by 2040. There will be no direct impacts on the SPA. However, both construction and operation of the road could lead to impacts on key foraging areas outside of the SPA and on birds from the SPA which are foraging within these areas.	
Land-take	There will be no land take within the SPA. Approximately 40 ha of land within the area of the Foyle floodplain known to support birds associated with the SPA will be lost to the scheme.	
Distance from the European Site or key features of the site *(from edge of the project assessment corridor)*	The proposed scheme is located approximately 20km west/south-west of Lough Neagh & Lough Beg SPA. Nevertheless birds which are known to use the SPA and which are designation feature species of the SPA are known to utilise an area of the Foyle floodplain partially encompassed within the project corridor during the winter months between Magheramason and the Burn Dennett crossing. In this location the proposed scheme varies between 0.3km and 1.8km from the River Foyle, running initially to the west of the existing A5, crossing to east of the existing A5 north of Bready and crossing back to west of the existing A5 just south of Grangefoyle Road.	
Resource requirements *(from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)*	None.	

Emissions *(e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)*	The SPA is some 20km west/south-west of the proposed works at its closest point. Emissions from the scheme, including run-off from construction and operation, and vehicle emissions are not likely to interact with the SPA.
Excavation requirements *(e.g. impacts of local hydrogeology)*	None.
Transportation requirements	Construction related traffic and operational use of the scheme may result in potential disturbance impacts upon whooper swan foraging outside of the SPA boundary during migration.
Duration of construction, operation, etc.	The construction of the northern section of Phase 1 of the proposed scheme will take 2-3 years. Phase 2 and 3 are outside of the possible area of interaction with the SPA species.
Other	None.
Description of avoidance and/or mitigation measures *Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:*	
Nature of proposals	At present the operational requirements of the construction are not finalised, therefore potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Location	Any mitigation relevant to the designation feature species of the Lough Neagh & Lough Beg SPA is likely to be restricted to the eastern Foyle floodplain in areas utilised by the relevant bird populations.
Evidence for effectiveness	Potential mitigation in terms of controlled working timeframe of April to September (inclusive) cannot be confirmed. Therefore the potential for disturbance impacts cannot be ruled out.
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	Transport NI will place contractual obligations on contractors to provide all necessary mitigation identified in Stage 2 of the assessment. Environmental Representatives employed by Transport NI will monitor the proposed scheme throughout construction.
Characteristics of European Site(s) ***A brief description of the European Site should be produced, including information on:***	
Name of European Site and its EU code	Lough Neagh and Lough Beg SPA (Site Code UK9020091)
Location and distance of the European Site from the proposed works	The proposed scheme is located approximately 20km to the west/south-west of the closest extent of the SPA.
European Site size	The site comprises Lough Neagh, Lough Beg and Portmore Lough and is 41,188 Ha in size.
Key features of the European Site including the primary reasons for	The site regularly supports internationally important numbers of wintering Bewick's swan (the five year peak mean for the period 1989/90 to 1993/94 was 251 which comprises 1.5% of the Western and Central Europe population and 10% of the Irish population) and whooper swan (the five year peak mean for the period 1989/90 to 1993/94 was 923 which comprises 5.4% of the total

selection and any other qualifying interests	Icelandic breeding population and 6.5% of the Irish population). The site also qualifies under Article 4.1 by regularly supporting nationally important numbers of breeding common tern (200 pairs in 1995 which comprises 7.4% of the Irish population). The site regularly supports over 20,000 waterfowl in winter, including pochard, tufted duck and goldeneye. Lough Neagh is also notable for supporting an important assemblage of breeding birds including the following species which occur in nationally important numbers: great crested grebe, gadwall, tufted duck, snipe, redshank, common gull, lesser black-backed gull and black-headed gull. Other important breeding wetland species include shelduck, teal, shoveler, lapwing and curlew.
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	The Lough drains some 40% of Northern Ireland and has been subject to severe eutrophication as a result of increased nutrient inputs from agricultural run-off and general domestic sewage from catchment housing and other developments. Historically, increased eutrophication may have enhanced wildfowl populations but the effect of eutrophication on such populations is little understood although it may have had a positive impact on wintering diving duck. Although some species e.g. swans, use improved fields, recent changes in agricultural land-use i.e. agricultural intensification (land improvements/high grazing levels) and, in some cases, insufficient grazing and tree/scrub management resulting in vegetation succession, may adversely affect feeding/roosting areas for overwintering and breeding waterfowl. Introduction of/invasion by non-native species such as Roach and potentially Zebra Mussels could have a deleterious effect on some species e.g. diving duck, but may be beneficial to others e.g. Great-crested Grebe. Sand dredging is widespread throughout the Lough but the impact is largely unknown. An existing Conservation Plan for Lough Neagh and Lough Beg is currently under review. This review will up-date existing management prescriptions and refine existing conservation objectives. A total of 15 management agreements (NNR/ASSI) mainly for agricultural issues, are established on the site. Phosphate stripping at appropriate STW has begun to address the issue of eutrophication. Other measures such as agric-improvement schemes and Water Quality Management Plans to further address this issue are being considered.

European Site conservation objectives – where these are readily available	To maintain each feature in a favourable condition[13,14].
Assessment Criteria *Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.*	
Potential Impacts on whooper swan The scheme has the potential to give rise to effects on whooper swan associated with this SPA through disturbance and habitat loss outside of the designated site. Mitigation proposals for the construction phase cannot be confirmed at this point, therefore, there remains a potential for significant effects. Potential Impacts of Bewick's swan No Bewick's swan were recorded in the area of potential interaction between the proposed scheme and the habitat supporting SPA designation feature species. Potential Impacts on other designation feature species Small numbers of Pochard, tufted duck and goldeneye were noted on the River Foyle. No significant impact is predicted for these species.	
Initial Assessment *The key characteristics of the site and the details of the Ramsar Site should be considered in identifying potential impacts.* *Describe any likely changes to the site arising as a result of:*	
Reduction of habitat area	None.
Disturbance to key species	The scheme may cause a significant effect on whooper swan due to disturbance.
Habitat or species fragmentation	The scheme is unlikely to cause a significant effect to whooper swan due to fragmentation since all sites currently used by the designation species will remain available
Reduction in species density	The scheme may cause a reduction in species density if the disturbance of foraging birds is sufficient to cause desertion of the Foyle floodplain adjacent to

[13] Feature refers to the selection features for the SPA.

[14] Individual objectives are set for each feature, they are too numerous to present in this table and are presented in Appendix 2, Table A2.2.

	the works by some or all of the designation species population that currently use it.
Changes in key indicators of conservation value (water quality, etc.)	The scheme is unlikely to result in changes in key indicators of conservation value as sufficient mitigation is in place.
Climate change	The scheme has the potential to contribute to the problem of climate change by increasing the carrying capacity of the current road network[15].
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	None.
Interference with key relationships that define the function of the site	Possible disturbance of whooper swans on grazing areas outside of the site could cause birds to lose foraging time, and expend energy avoiding the disturbance. Thus reducing the birds' fitness and ability to survive and impacting on the function of the site as winter bird habitat.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	No habitat loss within the SPA. Approximately 40ha of potential foraging habitat loss west of the existing A5, although no whooper swan have been recorded under the scheme footprint.
Disturbance to key species	There could be a significant effect subject to mitigation.
Habitat or species fragmentation	Unlikely to be a significant effect as all foraging habitat utilised by whooper swan will remain.
Loss	The project will not cause direct loss of whooper swan. Should disturbance be significant enough to cause abandonment of the preferred grazing areas there could be indirect mortality of whooper swan.
Fragmentation	No disruption of the SPA will occur. However, potential exists for disturbance during construction and operation to disrupt the natural foraging/roosting site interactions of whooper swan. This could have a significant effect on the SPA.
Disruption	Not significant.
Disturbance	No habitat loss within the SPA. Approximately 40ha of potential foraging habitat loss west of the existing A5, although no whooper swan have been recorded under the scheme footprint.
Change to key elements of the site *(e.g. water quality, hydrological regime etc.)*	There could be a significant effect subject to mitigation.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	

[15] *Ibid* footnote 10

Outcome of screening stage (delete as appropriate).	Significant effect possible on whooper swan.
Are the appropriate statutory environmental bodies in agreement with this conclusion (delete as appropriate and attach relevant correspondence).	**YES**

3.1.2 Concluding the screening exercise, the four SPAs under consideration have been subject to a screening exercise for the currently proposed scheme based on the guidance provided in HD 44/09 and using the suggested screening matrix template provided in Annex 4 of the guidance to record the findings of the process. In all three instances it has been concluded:

- the proposed scheme is a project which is not connected with or necessary to the management of the SPAs;
- the likelihood of the proposed scheme having a significant effect on the sites cannot be excluded on the basis of objective information; and
- that an appropriate assessment should accordingly be undertaken.

4 Stage 2 – Appropriate Assessment

4.1 Introduction

4.1.1 As described above, this stage considers the potential impacts on the structure, function, and conservation objectives of the Natura 2000 Sites. Where there is the potential for adverse impacts, an assessment of the potential mitigation of those impacts is presented. The assessment should consider the impacts the Proposal may have either alone or in combination with other projects or plans. This stage includes:

- A description of the Natura 2000 sites that will be considered in the AA;
- A description of significant impacts on the conservation feature of these sites likely to occur from the Plan;
- Mitigation Measures; and
- Conclusions.

4.2 Scope of the information to inform the appropriate assessment

4.2.1 'To ensure that all relevant information is considered in the assessment, the Department has carried out two consultations on the draft report and responses received have been taken into account in the development of this third draft Report.'

4.2.2 Across the board spectrum of potential impacts considered and assessed by the studies carried out to date, likely impacts identified which cannot be screened out on the basis of objective information on likely significant effect relate solely to:

- loss of feeding habitat (functional habitat)[16] at Dunnalong/Thorn Hill and Grange Foyle outside of the SPAs and which is used by wintering birds associated with the four SPAs; and
- disturbance of wintering birds associated with the four SPAs during their use of feeding habitat outside of the SPAs at Dunnalong/Thorn Hill and Grange Foyle.

[16] Habitat outside of a designated site which is used / relied on by species associated with the designated site

Loss of feeding habitat used by wintering birds associated with the four SPAs

4.2.3 The assessment has involved quantification of the extent of available feeding habitat within the Dunnalong /Thorn Hill and Grange Foyle areas and comparison with the total extent of such habitat available in the two areas. Precise quantification of available feeding habitat in this manner is the most objective means of assessing whether any consequent effect is likely to be significant and is the methodology adopted in this report.

Implications of Climate Change

4.2.4 Long term climate change predictions (to 2080)[17] indicate that natural winter precipitation is predicted to increase, with more frequent extreme winter events. By contrast, summer temperatures will increase and precipitation is likely to decrease. The implications of these changes to population numbers of migratory birds are difficult to predict due to their lifecycle being partly outwith the UK, however it is likely that the areas of land currently used for foraging will flood more often and to a greater extent. This may increase or decrease the areas of land potentially available for foraging, depending on topography, however these will be more likely influenced by agricultural policy and practice.

[17] The project assessment parameters have been based on UK climate change predictions from 2009 (UKCP09). Accordingly, the validity of these forecasts has been reviewed as part of this HRA exercise, using the latest guidance from UKCP09, prior to its proposed update in 2018.

The guidance (*Is UKCP09 still an appropriate tool for adaptation planning? April 2016*) concludes that UKCP09 continues to provide a valid assessment of future climate change over land. In particular it demonstrates that UKCP09 is competitive with results from the most recent assessment by the International Panel on Climate Change (IPCC), (CIMP5), such that:

- Future changes in summer and winter temperatures are consistent between CIMP5 and UKCP09 projections;
- Future winter rainfall changes are consistent between both models.
- Both CIMP5 and UKCP09 projections agree that long term average of summer rainfall are more likely to reduce than increase, however CIMP5 predicts a larger chance of an increase in summer rainfall, and less risk of a substantial reduction than UKCP09. This is attributable to the use of different data sets.
- Notwithstanding, the guidance states that users should still continue to regard the full range of UKCP09 results as plausible outcomes for summer rainfall, to consider planning decisions.

The review has concluded that the most up to date projected changes to the baseline environment with regard to precipitation and surface flows in streams as a consequence of climate change, remain the same as those used in the EIA and previous HRA reports. For summer precipitation and river flows, UKCP09 represents a worse-case scenario and under the precautionary principal, has been appropriately adopted as the working assumptions for the Scheme and in this HRA.

4.2.5 The potential for greatest disturbance of foraging birds however is in the short term, during the construction phases, which will experience limited climate change effects and will require no amendment to the current proposed adaptive monitoring and mitigation measures.

Disturbance of wintering birds associated with the four SPAs during their use of feeding habitat at Dunnalong/Thorn Hill and Grange Foyle

Data Sources

4.2.6 The following data sources have been relied on:

- data provided in the A5WTC ES 2010, including surveys undertaken at Dunnalong/Thorn Hill and Grange Foyle between October 2009 and April 2010;
- data derived from site surveys undertaken at Dunnalong/Thorn Hill and Grange Foyle between October 2013 and April 2014 by the Mouchel (now WSP) assessment team; and
- data for use of the area by whooper swan for 2010-2013 provided by the Irish Whooper Swan Study Group.

Information used to support the Impact assessment

4.2.7 There are no generally accepted thresholds for the loss of functional habitat or the numbers of birds which may be disturbed and displaced in the short-term or long-term from areas of functional habitat. Determination of whether either or both is likely to have a significant effect on the area of functional habitat and the species which use / are reliant on the area with consequent effects on the integrity of a designated site is necessarily context specific.

4.2.8 In the case of the four SPAs considered in this report, habitat loss has been quantified and represented as a percentage of the habitat which surveys have indicated are used and the overall extent of potential functional habitat within the area in the vicinity of the proposed scheme.

4.2.9 Potential for disturbance of the whooper swan and greylag geese which annually utilise the area has been considered relative to sources of disturbance during construction and operation and identification and consultation with NIEA and RSPB(NI) regarding mitigation measures with a particular focus on construction activities which are likely to involve higher and tonally distinct noise levels and characteristics. A detailed literature review has been carried out for the purposes of HRA and is included within this report. Reference to peer reviewed scientific studies on the impacts of disturbance upon birds, combined with the detailed assessments carried out and reported within the 2010 ES and 2016 ES, enables the assessments to be carried out and conclusions reached which are beyond the threshold of reasonable scientific doubt required by the Birds and Habitats Directives.

4.3 Determination of adverse impact relative to integrity

4.3.1 Once potential impacts have been identified, they are considered in relation to the potential to have a negative effect on the integrity of the Natura 2000 sites. The assessment determines whether there is likely to be:

- a reduction in the coherence of the ecological structure or function of the site, taking into account the whole area of the site, and supporting habitats which are integral to the structure and function of the site, and
- whether any such reduction would reduce the ability of the site to sustain the qualifying habitat and/or the levels of populations of the species for which it was classified.

4.3.2 The DMRB guidance (HD 44/09) provides a suitable checklist to identify interactions and potential effects on the integrity of the site. Completed checklists are provided in Appendix 4.

4.3.3 The definition for integrity adopted in this report is that provided in ODPM Circular 06/2005 and Defra Circular 01/2005 - *Biodiversity and Geological conservation – Statutory obligations and their impact within the planning system, as described in 2.2.3 above.*

5 Description of the proposed scheme

5.1 Alignment and relationship to the functional habitat associated with the 4 SPAs

5.1.1 The proposed scheme comprises an 85km dual carriageway running between the existing A5 north of New Buildings and the existing A5 south of Aughnacloy. Its location and relationship to the four SPAs is shown in Appendix 1 - Figure 1.

5.1.2 The section of the proposed scheme corridor which is of relevance to the three SPAs is that between Magheramason and the Burn Dennet. Here, the proposed dual carriageway will generally be located between 1.2 and 2km east of the River Foyle. It is an area of mixed arable and agricultural grassland some 40% of which is within the River Foyle floodplain. Parts of the area are used annually by whooper swan and greylag geese associated with the four SPAs for feeding[18].

5.1.3 Detail relating to the peak counts for whopper swan and greylag geese during the 2009 – 2010 and 2013 – 2014 surveys in the Foyle floodplain is provided in Appendix 11O of the 2016 ES. The location of the birds observed is shown in Figures 2 and 3 of that document (reproduced in Appendix 1 – Figures 2 to 3).

5.1.4 Over this section, the proposed scheme follows a north-south alignment which broadly reflects that of the existing A5. Between Magheramason and Bready it will be located some 200-250m west of the existing road and will be on embankment as it crosses Meenagh Road and approaches a proposed bridge over the existing A5, Victoria Road north of its existing junction with Cloghboy Road. South of the new bridge, the alignment will initially encroach onto the lower western-facing slopes of Sollus Hill in deep cutting. As the dual carriageway continues south it will be some 200m east of the existing road. It will emerge from the cutting and follow an alignment roughly parallel with the A5, crossing beneath Donagheady Road, and following a gentle curve to the south-west, passing between Willow Farm and housing on the A5,Victoria Road. It will cross Willow Road in shallow cutting and rise on high embankment to enable it to be bridged over the A5, Victoria Road. The dual carriageway will descend from the bridge to cross Ash Avenue on low embankment before rising again onto high embankment and crossing Drumenny Road via a new bridge before approaching and crossing the Burn Dennet via a new open span bridge.

5.1.5 Construction of this section, other than at Sollus Hill, will involve the use of large excavators, dump trucks for transporting excavated materials to areas of fill within the working areas, bulldozers, graders, compaction plant including various rollers and soil stabilisation plant. It is

[18] Either regularly during the winter, or during migration to and from the SPAs

not anticipated there will be a need for blasting, the break out of rock at Sollus Hill being implemented by way of rock breakers.

6 The Four SPAs

6.1 Introduction

6.1.1 The location, extent and relationship of the four SPAs to the proposed scheme is indicated in Appendix 1 – Figure 1. Details relating to the species identified as the primary reason for selection as a Natura 2000 site and qualifying species are described in Table 4.1. A comment on the vulnerability of the site is included. The information has been obtained from the Natura 2000 data forms obtained from the Joint Nature Conservancy Committee (JNCC) website (www.jncc.gov.uk) and the National Parks and Wildlife Service (NPWS) website (www.npws.ie). The Natura 2000 data forms are enclosed in Appendix 3.

Table 4.1 Site Descriptions

Site Name	Designation & Code	Designated Feature Species		Vulnerability
		Article 4.1 Species	Article 4.2 Species	
Lough Foyle	SPA UK9020031 (Northern Ireland) 004087 (ROI)	Wintering: Whooper swan Bar-tailed godwit	Wintering: Light-bellied brent geese International Wintering Assemblage: Red-throated diver Great crested grebe Mute swan Bewick's swan Greylag geese Shelduck Teal Mallard Wigeon Eider Red-breasted merganser Oystercatcher Golden plover Grey plover Lapwing Knot Dunlin Curlew Redshank Greenshank	Although a control programme has begun, the colonisation and spread of aggressive non-native species such as *Spartina* spp. is a current problem and poses a potential threat in the future. An existing Conservation Plan for Lough Foyle is now under review. This review will update existing management prescriptions and refine existing conservation objectives.

Site Name	Designation & Code	Designated Feature Species		Vulnerability
		Article 4.1 Species	Article 4.2 Species	
		Other notable species: Slavonian grebe		
Lough Swilly	SPA IE004075	Wintering: Whooper swan Greylag goose Greenland white-fronted goose	Wintering: Great crested grebe Grey heron Shelduck Wigeon Teal Mallard Shoveler Scaup Goldeneye Red-breasted merganser Coot Oystercatcher Knot Dunlin Curlew Redshank Greenshank Common gull Mute swan Breeding: Sandwich tern	The maintenance of the high numbers of geese and swans is dependent on the continuation of favourable land-use practices on the polders. The principal commercial activity within the estuarine part of the site is aquaculture. It is not known if this is causing significant disturbance to the estuarine habitats or the bird populations. Despite the proximity of several towns, water quality is generally satisfactory. Recreational activities occur in several areas of site and could cause some disturbance to the birds if not properly controlled.

Site Name	Designation & Code	Designated Feature Species		Vulnerability
		Article 4.1 Species	Article 4.2 Species	
			Common tern Black-headed gull	
		Other Species of Note: Light-bellied brent goose Pochard Golden plover Lapwing Ringed plover Grey plover Bar-tailed godwit Turnstone Great northern diver Slavonian grebe Pink-footed goose Herring gull Little grebe Irish hare		

Site Name	Designation & Code	Designated Feature Species		Vulnerability
		Article 4.1 Species	Article 4.2 Species	
Lough Neagh & Lough Beg	SPA UK9020091	<u>Wintering:</u> Bewick's swan Whooper swan <u>Breeding:</u> Common tern	<u>Wintering:</u> Pochard Tufted duck Goldeneye <u>Breeding:</u> Great crested grebe Gadwall Tufted duck Snipe Redshank Common gull Lesser black-backed gull Black-headed gull	The Lough drains some 40% of Northern Ireland and has been subject to severe eutrophication as a result of increased nutrient inputs from agricultural run-off and general domestic sewage from catchment housing and other developments. Historically, increased eutrophication may have enhanced wildfowl populations but the effect of eutrophication on such populations is little understood although it may have had a positive impact on wintering diving duck. Although some species e.g. swans, use improved fields, recent changes in agricultural land-use i.e. agricultural intensification (land improvements/high grazing levels) and, in some cases, insufficient grazing and tree/scrub management resulting in vegetation succession, may adversely affect feeding/roosting areas for overwintering and breeding waterfowl.

Site Name	Designation & Code	Designated Feature Species		Vulnerability
		Article 4.1 Species	Article 4.2 Species	
		Other Species of Note: Breeding: Shelduck Teal Shoveler Lapwing Curlew		Introduction of/invasion by non-native species such as Roach and potentially Zebra Mussels could have a deleterious effect on some species e.g. diving duck, but may be beneficial to others e.g. Great-crested Grebe. Sand dredging is widespread throughout the Lough but the impact is largely unknown. An existing Conservation Plan for Lough Neagh and Lough Beg is currently under review. This review will up-date existing management prescriptions and refine existing conservation objectives. A total of 15 management agreements (NNR/ASSI) mainly for agricultural issues, are established on the site. Phosphate stripping at appropriate STW has begun to address the issue of eutrophication. Other measures such as agri-improvement schemes and Water Quality Management Plans to further address this issue are being considered.

7 Potential impacts and mitigation

7.1 Loss of feeding habitat used by wintering birds associated with the three SPAs

7.1.1 The area of the Foyle floodplain between Magheramason in the north and the Burn Dennett in the south has been identified by RSPB and the Irish Whooper Swan Study group as the area of functional habitat for which there is an interaction between the proposed scheme and the qualifying species of the SPAs, due to the use of the area by birds associated with the SPAs for foraging, either as a regular winter foraging area, or during migration to and from the SPAs. Significant numbers of birds associated with the SPAs have been recorded within the Foyle floodplain, thus the potential impact of the scheme may be significant in terms of the integrity of the SPA and requires further assessment to determine if that is indeed the case.

7.1.2 There is approximately 1200 ha of potential foraging habitat within the area.

7.1.3 Figures 2 and 3 in Appendix 1 provide peak count numbers and locations of all recorded qualifying bird species for the surveys undertaken in 2009-2010 and 2013-2014 respectively. The numbers demonstrate that the area is used by two species, whooper swan and greylag goose. They also demonstrate that numbers for 2013-2014 have been significantly lower than the numbers recorded in 2009-2010 and that fewer parts of the area have been used. Discussion with RSPB NI indicated that birds were using foraging areas within the RoI, outside of the survey area, and at a significant distance from the proposed construction. For the purposes of this assessment it has been assumed the higher numbers and more dispersed pattern recorded in 2009-2010 is more representative of the use of the area by birds associated with the functional habitat, and is more likely to reflect the long term implications of wetter winters associated with climate change predictions.

7.1.4 Field survey results from 2013/2014 showed a peak count of 873[19] birds present on land within the area of the eastern floodplain, at Grange Foyle, approximately 46% of the whooper swan utilising the Lough Foyle/Lough Swilly SPA complex in January 2005. A peak count of 22 birds from north of Dunnalong Road equates to approximately 1.2% of the whooper swan utilising the Lough Foyle/Lough Swilly SPA complex based upon data from 2005. This represents a change in use pattern when compared to the 2009 A5 WTC EIA study (Mouchel (now WSP),

[19] This peak count is a summation of all of the highest counts regardless of the month in which those counts occur, it is likely to be artificially high, but allows a robust and precautionary approach to impact assessment.

2009), with fewer birds using the area north of Dunnalong Road and more within the Grange Foyle area.

7.1.5 Field survey results from 2013/2014 showed a peak count of 218 birds present on land within the area of the eastern floodplain, at Grange Foyle, approximately 9.2% of the greylag geese utilising the Lough Foyle/Lough Swilly SPA complex. The single bird observed north of Dunnalong Road represents <0.1% of the greylag geese utilising the Lough Foyle/Lough Swilly SPA complex.

7.1.6 During 2009-2010 an area of approximately 330 ha was used by up to 430[20] whooper swan, and an area of approximately 150 ha was used by up to 350 greylag geese. During 2013-2014 an area of approximately 130 ha was used by up to 205 whooper swan, and an area of approximately 117 ha was used by up to 65 greylag geese.

7.1.7 The proposed scheme will involve the loss of approximately 40 ha of land within the area of potential functional habitat representing some 3% of the total area of potential habitat. None of the land take will affect parts of the area where use by either species has been recorded in the two surveys periods. As can be seen from Figures 2 and 3 (Appendix 1), there are two core areas of usage by these birds within the study area, neither of which is subject to landtake by the Proposed Scheme. In addition, there are alternative feeding sites located elsewhere along the river.

7.1.8 In light of the small percentage of potential loss and absence of loss in areas where use has been demonstrated, it has been concluded there will be no need for mitigation in the form of provision of compensatory habitat. This conclusion is based upon the Source-Pathway-Receptor conceptual model of impact assessment.

7.1.9 In order for the existence of an impact to be proven, all three elements of the model must be present in any given context. In this case, the receptor is absent from potentially impacted areas. As no qualifying bird species have been shown to utilise the impacted areas, a corollary of that finding is that no impact is likely to arise which may adversely impact upon them.

7.2 Disturbance of wintering birds associated with the four SPAs during their use of feeding habitat at Dunnalong/Thorn Hill and Grange Foyle

The effects of disturbance on avifauna

7.2.1 Disturbance has the potential to produce negative impacts on wild bird populations. However, the way in which disturbance affects bird populations is complex and predicting impacts

[20] These numbers represent the highest count during a single survey visit, and allow an accurate calculation of the area of forage habitat in use at any one time.

requires a detailed knowledge of how disturbance affects populations and how this varies between species. The aim of this section is to review relevant research with a view to understanding whether any of the predicted sources of disturbance are likely to have a negative impact on populations of birds using the area around the proposal and, in particular, whether this could have an unacceptable impact on any species associated with the Special Protection Areas

7.2.2 The role of disturbance on bird populations has been extensively studied both to identify problems with species of conservation concern and as a tool in deterring unwanted species from sensitive areas e.g. airports and valuable crops. While most organisations concerned with management of the countryside actively encourage increased access to the countryside, the resultant increased disturbance can often have significant negative effects on wildlife.

7.2.3 There are two factors to consider when assessing the impact of human disturbance on feeding areas. First, does the disturbance lead to changes in behaviour? Second, does any consequent change in behaviour affect mortality, reproductive success or population size (Gill et al. 2001)? The majority of studies on disturbance concentrate on the first factor in one of two ways: comparison of animal distributions between areas with and without disturbance (e.g. Tuite, Hanson and Owen 1984; Pfister, Harrington and Lavine 1992; Sutherland and Crockford 1993; Milsom et al. 2000), and observations of the direct effects of disturbance on behaviour (e.g. Draulans and van Vessem 1985; Belanger and Bedard 1989). Many studies of this type have focussed on shorebirds as they appear susceptible to disturbance and occur in areas used by large numbers of people (e.g. Burger 1981; Kirkby, Clee and Seager 1993; Smit and Visser 1993).

7.2.4 It is generally accepted that most waterfowl populations are limited by availability of food during the winter months (see Owen and Black 1990 for a review). The factors controlling the populations are thought to be “density-dependent” and lead to the population tending towards the “carrying capacity” i.e. the numbers an individual site can support. For example, when numbers of a species are relatively high, mortality will increase resulting in a decrease in the population. Conversely, when numbers are low, mortality will decrease until numbers increase to the carrying capacity of an area. In the case of waterfowl, density-dependence is thought to act through two factors. First, through the availability of prey/food during the winter months. Second, through the levels of fat birds can lay down prior to spring migration. This is important, as the breeding success of many species is directly related to the availability of reserves on arrival in the breeding grounds, especially for arctic-breeding waders and wildfowl.

7.2.5 The nature of the density-dependent factors and the timing of their impact need to be understood if meaningful management measures are to be employed. This is recognised in the models used to assess the “surplus” in wildfowl populations that can be exploited through wildfowling. In these models, mortality before the winter food “bottleneck” (when mortality becomes density-dependent) is termed “compensatory mortality” as the removal of birds at this time reduces the mortality during the population bottleneck. Mortality after the bottleneck, will result in a reduction in the population (as the population has already been reduced to the “carrying capacity”) and is termed “additive mortality”.

7.2.6 The recent development of incorporating behavioural ecology theory into conservation research has led to a much better understanding of how factors such as disturbance or habitat loss affect populations of wild animals (Sutherland 1998). In particular, studies of waterfowl populations have changed the way potential impacts should be assessed (Gill 2007, Stillman et al. 2007). These studies have led to an increased understanding of the roles of various potential threats to populations and have even led to the first models capable of predicting impacts of development on major estuarine sites (Durrell et al 2005).

7.2.7 Studying the impact of shellfishing at low tide on Oystercatchers on the Exe estuary, Stillman et al (2000), examined the role of disturbance in reducing access to feeding areas. This model was modified to take into account the time and energy costs associated with that disturbance, including energy expended flying away from disturbance and feeding time lost as a result of the disturbance (West et al 2002). This study showed that disturbance from many small sources was more significant than fewer large scale sources and that disturbance could be more significant than habitat loss. However, the model also made recommendations on how to minimise the impact of the disturbance and that "preventing disturbance during late winter, when feeding conditions were worse, practically eliminated its predicted population consequences" (Stillman et al 2007). The model demonstrated that disturbance produced very little impact if restricted to daylight hours and if occurring before 1 December. Large-scale disturbance (10% of the site) produced less effect than numerous small events as this involved less commuting energy.

7.2.8 In a major study of wading birds on the Seine estuary, France, Durrell et al (2005) used a similar behaviour-based model to predict the impact of an extension to the port at Le Havre on the Seine estuary. They were able to assess the significance of;

- a reduction in available habitat;
- disturbance during the night and the day;
- the introduction of a buffer zone around the development;
- the effectiveness of introducing a new mudflat area as mitigation.

7.2.9 Supporting the findings of the effect of daytime disturbance on Oystercatchers on the Exe estuary, the authors found "when we simulated disturbance occurring during the daytime only, birds were able to feed within this area at night. In this case, the effect of disturbance was greatly reduced in dunlin and removed altogether in curlew and oystercatcher". Introduction of a 150m "buffer" zone "effectively removed the effect of disturbance on feeding shorebirds.

The effect of disturbance on exploitation of resources

7.2.10 The value of a site to a local population can be reduced where disturbance levels result in either reduced levels of exploitation or significantly increased costs associated with that exploitation e.g. commuting costs. Where disturbance may be chronic and birds excluded from feeding areas for long periods of time, feeding when disturbance levels are lower e.g.

bad weather, early morning, may result in the same level of use as at sites where disturbance is minimal. The best way to directly assess the role of disturbance on the level of exploitation is to measure prey depletion where the study species is the only predator and where the prey species is non-renewing. This was studied in Black-tailed Godwits feeding on bivalves in the southeast of England. Gill et al. (2001) studied the levels of depletion in bivalve populations at sites experiencing a wide range of levels of disturbance. They predicted that disturbance could result in a slower rate of exploitation, leading to unused resources at the end of the winter. The level to which the resources are unused will determine the extent of the consequent reduction to carrying capacity of the site.

7.2.11 The study showed that even at sites with very high levels of disturbance (including a yacht club), Godwits visited the disturbed areas during periods of low disturbance and depleted prey to similar levels recorded at sites where disturbance was minimal. This demonstrated that the value of a feeding area to a species may not be diminished as long as birds are able to feed sufficiently often to exploit the site fully.

7.2.12 Following "Ideal Free Distribution" theory, areas of high food availability will be preferred to areas of low availability. Where disturbance does result in reductions in foraging effort, food availability is likely to be greater than on adjoining undisturbed areas. When the source of disturbance is removed, or habituated to (see below), birds would be expected to prefer these areas for foraging and, given sufficient time to exploit the resource, will deplete the resource to the same levels as the adjoining undisturbed areas. The key point in studying this type of scenario is to identify whether sufficient opportunities are available for sites/areas within sites, to be exploited fully.

The potential impact of Construction Activity and Noise

7.2.13 There are two locations where construction will involve noise levels above those associated with the general activities associated with movement and activity of plant and vehicles; where the deep cutting at Bready will involve breaking out of rock at Sollus Hill and where piling will be required for the bridge abutments at the Burn Dennet. The Bready cutting is some 400m from the closest recorded Whooper swan and over 1km from the closest recorded Greylag geese. The Burn Dennett crossing is some 500m from the closest recorded area known to be utilised by Whooper swan and over 2.5km from the closest recorded Greylag geese.

7.2.14 Scottish Natural Heritage (SNH) provide guidance on potential impacts on European/Ramsar Sites[21], in which they state that in relation to noise disturbance of birds:

Studies generally show that birds are disturbed by a sudden large noise but have the ability to habituate (become accustomed to) to regular noises. For instance, with respect to piling

[21] http://www.gov.scot/Publications/2011/03/04165857/15 accessed 23/03/2017

specifically, it has been concluded that although piling has the potential to create most noise during construction, it often consists of rhythmic "bangs", which, after a short period, birds are likely to become accustomed to (ABP Research, 2001).

and:

As part of the construction work for ABB Power Generation Ltd (Pyewipe), winter bird monitoring showed that there was no large-scale disturbance due to construction work on the site. Although some localised disturbance was recorded in response to two sudden events, this was not considered to have a major effect on surrounding bird populations and was found to be no greater than the effect arising from third party disturbance, including walkers and stopped cyclists, which were unrelated to the work carried out by ABB (ERM, 1996). Observations suggested that it was the initial sudden bang during piling activities, which caused the disturbance, and that subsequent bangs typically resulted in reduced disturbance, demonstrating habituation.

These findings were supported by the studies carried out for the Humber International Terminal development, which again indicated that the key factor in triggering disturbance was human presence (ABP Research, 2000). Over 12 separate visits, disturbance by construction activities (which involved piling and reclamation of part of the foreshore) was observed on 3 occasions and in each case birds were disturbed over a small area and then rapidly resettled within the zone of disturbance (i.e. they did not leave the area). More recently, surveys of the birds around the Immingham Outer Harbour in the Humber (using the same methods) have also indicated that such disturbance events are limited and are often attributable to non-Port related activities such as the presence of Peregrine Falcons or walkers on the mudflat (ABPmer, 2010e).

The ABP Teignmouth Quay Development estimated an approximate zone within which birds may be affected by disturbance from construction works (piling and dredging) to be typically about 200m (ABPmer, 2002). The startling effects of sudden noise were quantified, based on published research, by the Environment Agency for the Humber Estuary Tidal Defences scheme. It was concluded that a sudden noise in the region of 80dB appears to elicit a flight response in waders up to 250m from the source, with levels below this of approximately 70dB causing flight or anxiety behaviour in some species.

7.2.15 Following discussion with the geotechnical advisors and contractor advisors for the project it has been confirmed that blasting will not be required. Should further information come to light as the proposed scheme design is finalised which demonstrates a need for blasting, there will be a limitation placed on the timing of the activity to exclude the period between October and March when the birds are present. Such a restriction eliminates the potential for adverse impact from this source.

7.2.16 There will also be a requirement under the contract that should it be the intention to undertake breaking out of rock at Bready and piling at the Burn Dennet within the period when the birds

are present, trial breaking out and piling must be undertaken with monitoring by an appropriately qualified OCoW indicated above.

7.2.17 The trials will involve short periods of breaking out and piling at prescribed intervals to establish if the activity results in disturbance which could prove detrimental, should the more prolonged periods of the activities which will be required to complete the cutting and bridge abutments be progressed. If the trials indicate this will be likely to the case, the activities will be suspended while whooper swan or greylag geese are within 300m of the noise source. The following factors will be considered to be probative of detrimental disturbance.

- Physical displacement of birds (flight from source) with non-return within 5 minutes;
- Reduction in foraging activity due to increase in scanning times.

7.2.18 Should these responses be noted, works will be suspended as above.

7.2.19 In consequence, and subject to the mitigation strategies outlined above, construction disturbance impacts are therefore considered to be not significant in relation to the conservation objectives for the SPAs, or the integrity of the sites.

Daytime feeding opportunities

7.2.20 Whooper Swans foraging on land at some distance from water must make daily commuting flights between roosting and foraging areas. In respect of such flights, three factors may safely be assumed to be implicated in the timing and duration of these flight; day length, temperature and safety. During midwinter birds naturally endure long periods of darkness, often combined with low temperatures, and it is probable that birds are likely to have lower morning energy stores than at other times of the year. Additionally, the impact of low temperatures and prolonged darkness is that less time is available for foraging as whooper swans are visual feeders. Assuming that the time swans spend at their foraging grounds is positively correlated with energy requirements, in midwinter birds should arrive earlier at, and depart later from, their foraging areas. In addition, time spent feeding during the day should increase relative to day length. These conditions may induce an energetic bottleneck during December & January.

7.2.21 With regard to disturbance of the two species associated with construction of the proposed scheme, studies reported by Rees et al (2005) - *Factors affecting the behavioural responses of whooper swans (Cygnus c. cygnus) to various human activities* noted that pedestrian presence disturbed whooper swans when within 250-400m, and that construction vehicles disturbed whooper swan when within 250m, in contrast to tractors which caused disturbance when within 150m and other farm vehicles which caused disturbance when within 250m.

7.2.22 The proposed scheme will generally involve construction significantly more than 250m from those parts of the area of functional habitat where the presence of the species has been has been recorded during the surveys. Locations closest to parts of the area where presence has been recorded are:

- where the realignment of Donagheady Road will bring the works within 50m of an area of recorded use, although the works will be separated from the swans by the existing A5 with its current levels of traffic (see Operational Disturbance below); and .

- where the proposed introduction of a new link road between Ash Road and Drumenny Road will involve work within 100m of a part of the area where a maximum of 9 swans were recorded in 2009-2010.

7.2.23 When considering opportunities for the swans and geese to forage for food, it is appropriate to consider available natural light. The period known as "Civil Twilight" is the time in which the sun is <6° below the horizon and is the time during which it is considered light enough to work outside without the need for artificial light. During winter months Civil Twilight lasts approximately 30-35 minutes. Most visual foragers (including swans and geese) will be able to forage effectively during this time (and probably for a lot longer).

7.2.24 Normal working times specified in the construction contract in relation to the control of noise and vibration are:

- 1st February to 31st October – 07:00 to 19:00 hours

- 1st November to 31st January – 08:00 to 17:00 hours

7.2.25 Therefore, it can be seen from Figure 1 below that during the winter months, there will be sufficient light available for foraging swans and geese during non-working periods in early October and again in early November[22], with a further period light enough for foraging occurring outside working hours from early February onward.

[22] As clocks go back and it becomes light 'earlier'.

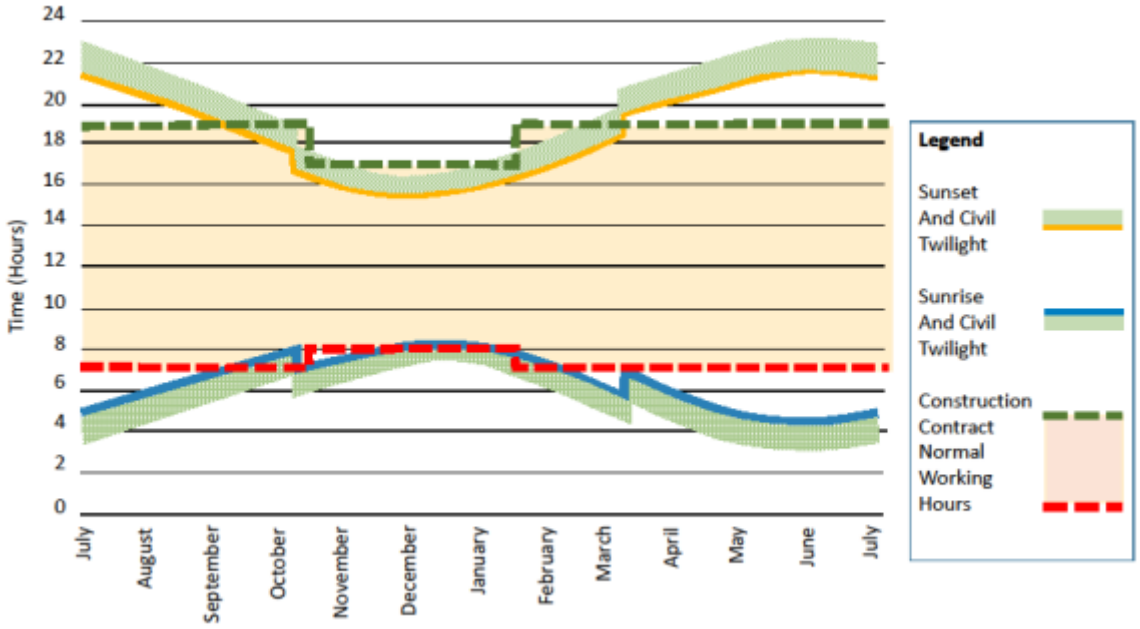

Figure 1: "Civil Twilight" hours in relation to time of year and normal working hours w.r.t. noise and vibration on the site within 250m of areas known to be utilised by swans and geese.

7.2.26 The limits of the contract working hours are particularly relevant to visual foragers as they are less likely to feed at night and daylight may affect the levels to which they can accrue resources. This could be of particular significance during energetically demanding times such as pre-migration fat deposition and moult.

7.2.27 To minimise adverse disturbance effects upon Whooper swans during this period, there will be no heavy construction work between chainage 5000 and 10,500, within 250m of areas shown to be utilised by Whooper swans and geese. All construction in this areas would be conducted under the advice of an Ornithological Clerk of Works (OCoW). Working hours within these areas will be reduced to between 08.00-17.00 hrs, between 1st October and March 31st, or as advised by the OCoW.

7.2.28 Adherence to the construction time periods, in accordance with OCoW instructions as set out above, will eliminate any potential for a reduction in available foraging opportunities as a result of construction between chainage 5000 and 10,500 known to be utilised by Whooper swans and geese.

7.2.29 The disturbance associated with the proposed development will not be continuous throughout. In view of the close proximity to other feeding areas elsewhere, birds would be likely to respond to periods of no disturbance by feeding preferentially within areas in proximity to the proposal site until the resource levels were similar to neighbouring areas.

7.2.30 As indicated above, a precautionary watching brief will be employed by a suitably qualified and experienced Ornithological Clerk of Works (OCoW). The OCoW will monitor whooper swan and greylag goose distribution and behaviour when works identified as potentially disturbing (e.g. noisy work, high numbers of personnel outside of vehicles etc.) are taking place. The watching brief will commence the day before planned activities and will cease the day following planned work. Should the OCoW determine that swans and geese are showing signs of significant disturbance, the ornithologist will immediately inform the Site Manager and Environmental Manager, and works will cease until foraging activity resumes. The following factors will be considered to be probative of detrimental disturbance.

- Physical displacement of birds (flight from source) with non-return within 5 minutes;
- Reduction in foraging activity due to increase in scanning times.

7.2.31 Implementation of the strategy outlined above will eliminate any potential for a reduction in available foraging opportunities as a result of construction between chainage 5000 and 10,500 known to be utilised by Whooper swans and geese.

Operational disturbance

7.2.32 The operation of the proposed scheme also has potential to cause disturbance to bird species, with the noise generated from increased traffic volume and speeds potentially causing the displacement of whooper swan through increased disturbance. However, behavioural impacts such as disturbance from feeding grounds as a result of construction or operation phases are always context-dependant, with responses to disturbance depending upon the trade-offs experienced by individual birds (Gill, 2007). For example, the decision to stay or to leave an area in response to disturbance will be influenced by the quality of the area, availability and relative quality of alternative areas, and relative predation risk on current and alternative sites among others (Gill, 2007). Habituation, that is 'the relatively persistent waning of a response as a result of repeated stimulation which is not followed by any kind of reinforcement' (Hinde, 1970), has been demonstrated in the short-term in some studies on disturbance to whooper swan, however an increased tolerance did not appear to be maintained over longer periods with the behavioural patterns on a day to day basis providing additional support to this (Rees et al., 2005).

7.2.33 While the closest approach of the mainline to a field with recorded whooper swan use is around 150m, which is at the limit of the distance recorded for tractor disturbance of whooper swan (Rees *et al*, 2005), the study was in relation to disturbance ‘events’ rather than exposure to constant stimuli. Whooper swan have been shown to quickly habituate to continuous traffic movements, for example at the Toome Bypass (Hill. M, 2014, *Pers. Comm*). Therefore, operational disturbance is unlikely to have a significant effect.

7.2.34 To determine the potential for disturbance of greylag geese it is important to understand the distances over which they will be disturbed. Keller (1989) identified greylag geese avoid roads in agricultural land in Scotland, with avoidance behaviour recorded for distances of 100m from

roads. The closest recorded greylag geese in any of the studies undertaken was over 500m, thus operational disturbance is unlikely to occur.

7.2.35 Operational disturbance impacts are therefore considered to be not significant in relation to the conservation objectives for the SPAs, or the integrity of the sites.

8 Summary

8.1.1 The Lough Foyle SPAs, Lough Swilly SPA and Lough Neagh & Lough Beg SPA have been identified as Natura 2000 sites with a relationship to the proposed A5WTC which requires that they should be considered in the context of the EC Birds Directive, as transposed by the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 as amended by the Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2012 in Northern Ireland and the European Communities (Natural Habitats) Regulations 1997 (as amended) in the Republic of Ireland

8.1.2 All four SPAs have been subject to a process of Stage 1 screening based on the guidance provided in HD 44/09 of Volume 11 of the Design Manual for Roads and Bridges. In all three instances it has been concluded:

- the proposed scheme is a project which is not connected with or necessary to the management of the SPAs;
- the likelihood of the proposed scheme having a significant effect on the sites cannot be excluded on the basis of objective information; and
- that Stage 2 Appropriate Assessment should be undertaken.

8.1.3 This document provides further information to inform the Appropriate Assessment for the four SPAs. The information is being made available to statutory consultees and for wider public consultation. The information in this report and information received in response to the consultations will be considered by Transport NI and the Minister, as the Appropriate Assessment is completed in advance of a decision to proceed or not in accordance with the requirements of the Directive and Regulations.

8.1.4 In conclusion:

- The A5WTC has been designed to avoid features related to Natura 2000 sites as far as possible;
- There is a high level of knowledge of the qualifying features (habitats and species) in the study area;
- Best practice mitigation has been included in the scheme design;
- Any increase in the size of core foraging areas outwith the SPA as a consequence of wetter winters due to climate change can be managed through monitoring (a watching brief) by a qualified ornithologist over the construction period; and
- Based on the best scientific knowledge available, there will not be a significant effect on the conservation objectives of the SPAs.

8.1.5 The information provided in this report indicates the proposed scheme will not have an impact on the integrity of the four sites either independently or in combination with other projects. This final view, however, cannot be concluded until any further representations are assessed.

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