



# SONI

## Transmission Development Plan for Northern Ireland 2018 - 2027

### Habitats Regulations Assessment Report

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# **Transmission Development Plan for Northern Ireland 2018 - 2027**

## **Habitats Regulations Assessment Report**

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# 1 INTRODUCTION

This report has been prepared by RPS on behalf of the System Operator for Northern Ireland (SONI). The purpose of the report is to document a shadow Habitats Regulations Assessment (HRA) that RPS has conducted on behalf of SONI.

This HRA Report (comprising a shadow HRA) shall be provided to SONI (the Competent Authority) to assist them in fulfilling their duties in accordance with The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, as amended (the 'Habitats Regulations').

This report documents evaluation and analysis seeking to establish whether or not a decision to adopt the draft Transmission Development Plan Northern Ireland (TDPNI) 2018-2028 is likely to have a significant effect on any European site, and if so whether those Likely Significant Effects (LSEs) will adversely affect the integrity of any European site.

The assessment firstly considers the proposed projects within the TDPNI by itself and secondly in combination with other relevant plans or projects, and has been undertaken in view of best scientific knowledge and in view of the conservation objectives of the sites concerned.

A Strategic Environmental Assessment (SEA) Environmental Report has also been prepared in accordance with the European Communities Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) and in accordance with the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004).

The TDPNI is intended to guide the development of the electrical network in Northern Ireland to ensure all future requirements will be met by presenting a vision for future operations of SONI from 2018 to 2028. Refer to Section 3 for further details. On this basis, the TDPNI or any subsequent review of the Plan is not directly connected with or necessary to the management of any site as a European Site. As such, it will be subject to the assessment procedure under Article 6(3) of the Habitats Directive.

## 2 METHODOLOGY

The Environment and Heritage Service of the then Department of the Environment for Northern Ireland published '*Habitats Regulations guidance notes for competent authorities*' (EHS, 2002). Their purpose was to help competent authorities and others with an interest in such sites interpret and implement the Habitats Regulations, and were intended to provide a framework for making judgements under the Regulations in order to promote consistency amongst decision-makers.

In addition to the guidelines published by the Department, the European Commission has published a number of documents which provide a significant body of guidance on the requirements of Appropriate Assessment, most notably including, '*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*' ([EC, 2001](#)), which sets out the principles of how to approach decision making during the process.

These guidelines have been followed in the preparation of this report. The following list identifies these and other pertinent guidance documents:

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg ([EC, 2000](#));
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg ([EC, 2000b](#));
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels ([EC, 2001](#));
- Habitats Regulations Guidance Notes for Competent Authorities. Environment and Heritage Service. Belfast (EHS, 2002) [*not available online*];
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Publications Office of the European Union, Luxembourg ([EC, 2007](#));
- The Appropriate Assessment of Plans in Northern Ireland. RSPB, Belfast ([RSPB, 2008](#));
- Estuaries and Coastal Zones within the Context of the Birds and Habitats Directives - Technical Supporting Document on their Dual Roles as Natura 2000 Sites and as Waterways and Locations for Ports. Publications Office of the European Union, Luxembourg ([EC, 2009](#));
- Ecology Guidelines for Electricity Transmission Projects - A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects. EirGrid, Dublin ([EirGrid, 2012](#));
- Interpretation Manual of European Union Habitats. Version EUR 28. Publications Office of the European Union, Luxembourg ([EC, 2013](#)); and
- Guidance on Energy Transmission Infrastructure and EU nature legislation. Publications Office of the European Union, Luxembourg ([EC, 2018](#)).

A shadow Screening and Test of Likely Significance is firstly conducted in accordance with relevant European Commission and national guidelines. It seeks to determine whether or not Likely Significant Effects (LSEs) on any European site are likely to arise as a result of the proposals contained in the TDPNI.

In accordance with European Commission guidance '*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*' ([EC, 2001](#)), and the judgment of the CJEU in case [C-323/17](#) (People over Wind), measures intended to avoid or reduce the harmful effects of the proposed development on European sites have not been taken into account at screening stage.

The threshold for a Likely Significant Effect (LSE) is treated as being above a *de minimis* level. A *de minimis* effect is a level of risk that is too small to be concerned with when considering ecological requirements of an Annex I habitat or a population of Annex II species present on a European site necessary to ensure their favourable conservation condition. If low level effects on habitats or individuals of species are judged to be in this order of magnitude and that judgment has been made in the absence of reasonable scientific doubt, then those effects are not considered to be likely significant effects.

EHS (2002) notes that any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding *de minimis* or inconsequential effects.

Case law of the CJEU also helps interpret the concept of significant effect. Case [C-127/02](#) (Waddenzee) has confirmed that a significant effect is triggered when:

- there is a probability or a risk of a plan or project having a significant effect on a European site;
- the plan is likely to undermine the site's conservation objectives; and
- a significant effect cannot be excluded on the basis of objective information.

The Opinion of the Advocate General in case [C-258/11](#) (Sweetman -v- An Bord Pleanála) notes that the requirement that the effect in question be 'significant' exists in order to lay down a *de minimis* threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.

### **3 THE PLAN**

SONI is the national electricity Transmission System Operator (TSO) in Northern Ireland under a licence granted by the Northern Ireland Authority for Utility Regulation under Article 10(1)(b) of the Electricity (Northern Ireland) Order 1992 (the Order). SONI is responsible for operating and maintaining a safe, secure, economic and reliable electricity system. Working in co-operation with the system owner NIE Networks, SONI develops the electricity grid infrastructure for Northern Ireland. Investment in grid development is required to improve the grid for reliability, to support economic growth, to enable competition, and to connect more renewable energy.

In line with its licence obligations as TSO in Northern Ireland, SONI is obliged to draft a 10 year Transmission Development Plan outlining projects that are needed for the operation of the transmission system. Using the most up to date information on the current and projected future requirements for the operation of a secure, reliable grid, the Transmission Development Plan for Northern Ireland 2018-2028 is currently being compiled. In addition, future needs that may drive future potential projects will also be considered.

The TDPNI will present an overall Grid Strategy for Northern Ireland and the projects planned to be progressed over the next 10 years (2018-2028).

#### **3.1 ELECTRICITY IN NORTHERN IRELAND**

The basic function of an electricity system is to connect the sources of energy (generators) with the ultimate users (demand) of that energy. The electricity network can be sub-divided into the transmission and distribution systems. The transmission system moves bulk electricity on high voltage lines or underground cables from where it is generated to areas, known as demand centres) where it is needed (these are termed bulk supply points). This can be likened to a motorway or high-capacity road which facilitates the bulk of vehicle movements. The separate distribution system, which operates at lower voltages, is like smaller lower-capacity roads, delivering electricity from these bulk supply points into homes and businesses.

The existing electricity transmission system in Northern Ireland was largely in place by the late 1960s, with an electrically strong transmission system having been developed to link major fossil fuelled power stations and to deliver bulk electricity to the more heavily populated areas. Northern Ireland has three large fossil fuel power stations; Ballylumford, Kilroot, and Coolkeeragh.

Voltages at or above 110 kV are used in the transmission system as they can deliver large quantities of power over long distances, very efficiently. The transmission system in Northern Ireland consists of approximately 400km of 275kV overhead line, almost all double circuit, developed between 1963 and 1978. The 110kV system consists of 924km of overhead line and 90km of cable, with the majority installed between 1944 and 1958. Figure 3.1 shows the existing Northern Ireland electrical transmission system. The distribution system operates at lower voltages of between 33kV and 230V and distributes electricity to customers' homes and business premises.



Figure 3.1: Northern Ireland Transmission System

The Northern Ireland electrical system is connected to the Scottish system via the Moyle Interconnector, which runs from Islandmagee to Ayrshire. Existing interconnection with the Republic of Ireland is principally achieved by a 275kV double circuit connection between Tandragee and Louth substations, and there are two smaller 110kV standby connections at Enniskillen and Strabane. A second North-South interconnector, operating at 400 kV has acquired statutory planning approval in both Ireland and Northern Ireland and is planned to be operational by winter 2021.

The transmission system is designed to certain standards known as the Transmission System Security and Planning Standards, approved by the Utility Regulator. These standards include among other things, a requirement that the system is designed, built and operated in such that if a single component fails (also known as a credible contingency) there will be an alternative available, and customer supplies will not be interrupted.

It is SONI’s role to plan (including outline design and consents) an electrical system that will maintain compliance with the standards based on reasonable assumptions about the evolution of the generation,

supply, consumption and exchanges with other countries, taking into account investment plans for regional and Community-wide networks.

The type of generation technology deployed and the geographical location of that generation is a matter for developers and the planning process, and is not within SONI's remit. For both regulators and licensees this means a level of uncertainty in planning, delivering and funding system development. To reflect this uncertainty SONI considers several different scenarios and will perform sensitivity studies as appropriate.

Substantial system reinforcement is required to ensure that the transmission system continues to meet the planning standards as changes to the generation portfolio and demand occur over time including the connection of renewable generation. When considering system reinforcement SONI is obliged to balance the costs to the consumer, system security and its impact on the environment.

## 3.2 OBJECTIVES AND POLICIES OF THE TDPNI

The TDPNI is being prepared in accordance with Article 22 of European Directive 72/2009 and Condition 40 of the SONI TSO Licence. In accordance with the license condition the TDPNI has the following overarching objectives, which are the key drivers for the Plan:

- a) Indicate to market participants the main transmission infrastructure that needs to be built or upgraded over the next ten years;
- b) Contain all the investments already approved by the Utility Regulator and identify new investments which have to be executed in the next three years;
- c) Provide for a time frame and estimate of costs (where reasonable) for all investment projects;
- d) Contain such other matters as shall be specified in directions issued by the Utility Regulator from time to time for the purposes of the condition; and
- e) Contain a reasonable number of future scenarios, which reflect uncertainties and shall, as far as practicable, be consistent with scenarios that licensee uses in other relevant areas of work.

Within Section 4 of the TDPNI there are several sets of Policies and Objectives which are set out to assist in delivery of the grid strategy objectives in a sustainable manner. Environmental policies (ENVP) have been compiled to ensure that SONI has due regard for existing environmental protection legislation and environmental best practice when developing projects. Environmental objectives (ENVO) have also been developed for a number of environmental topics. These objectives aim to go beyond legislative requirements and good environmental practice in the development of the Grid.

### General Environmental Policy

**ENVP1:** To promote best environmental practice in the design and appraisal of transmission development projects.

### Biodiversity Policy

**ENVP2:** To exercise its functions as a TSO in line with the Wildlife and Natural Environment Act (Northern Ireland) 2011 and the Northern Ireland Biodiversity Strategy (2015) to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions.

**ENVP3:** To avoid adverse effects on sites designated for nature conservation including, Special Conservation Areas, Special Protection Areas, RAMSAR Sites, Areas of Special Scientific Interest.

**ENVP4:** To protect NI priority species and habitats in the development of any transmission infrastructure.

### Biodiversity Objective

**ENVO1:** To prepare and utilise industry specific Ecology Guidelines for the development of Transmission projects. This will ensure a standard approach to ecological impact assessment for transmission projects.

#### Climate Change Policy

**ENVP5:** To integrate measures related to climate change into grid development, by way of both effective mitigation and adaptation responses, in accordance with available guidance and best practice.

#### Noise Policy

**ENVP6:** To employ methods on transmission infrastructure which minimise noise emissions in line with best industry practice.

#### Noise Objectives

**ENVO2:** To give careful consideration to the siting of transmission infrastructure so as to ensure that noise-sensitive receptors are protected from potential noise emissions.

**ENVO3:** To seek to preserve and maintain noise quality in accordance with good practice and relevant legislation.

#### Landscape Policy

**ENVP7:** To have regard to the Northern Ireland Landscape Character Assessment 2000 in the design and appraisal of its transmission development projects.

#### Landscape Objective

**ENVO4:** To protect landscapes through the sustainable planning and design of transmission infrastructure.

#### Cultural Heritage Policy

**ENVP8:** To take reasonable measures to ensure that the special interest of protected structures, including their curtilages and settings, are protected when considering site or route options for the planning of transmission infrastructure.

**ENVP9:** To protect archaeological material when planning transmission infrastructure, by avoidance or by best practice mitigation measures.

#### Water Policy

**ENVP10:** That there is no increase in flood risk as a result of transmission development, and to ensure any flood risk to the development is appropriately managed.

**ENVP11:** To promote the use of sustainable urban drainage systems in any new developments where it is appropriate.

**ENVP12:** To have regard to Planning Policy Statements and Supplementary Planning Guidance: PPS 15 Planning and Flood Risk Development Control Considerations in the preparation of grid development strategies and plans.

### Water Objective

**ENVO5:** That all grid development proposals, and in particular, transmission substation developments, shall carry out, to an appropriate level of detail, a site-specific Flood Risk Assessment that shall demonstrate compliance with all current Guidelines, standards and best practice. The Flood Risk Assessment shall pay particular emphasis to residual flood risks, site-specific mitigation measures, flood-resilient design and construction, and any necessary management measures.

### Air Quality Policy

**ENVP13:** To preserve and maintain air quality in accordance with good practice and relevant legislation in the proposed construction of its transmission projects.

**ENVP14:** To ensure appropriate dust suppression during construction works.

### Tourism Policy

**ENVP15:** To consider the potential impact upon tourism in the planning of transmission projects.

### Tourism Objective

**ENVO6:** To identify the nature of tourism in a project area; to consider the cumulative / in combination impact on tourism of a project and to consider short term and long term impacts of grid development projects on tourism as appropriate.

### Technology Policy

**TP1:** To promote and facilitate the sustainable development of a high-quality transmission grid to serve the existing and future needs of the NI population.

**TP2:** To consider all practical technology options in the development of projects, including maximising use of existing transmission grid.

### Project Development Policy

**PDP1:** To develop projects in accordance with SONI's *Process for Developing the Grid in Northern Ireland*.

**PDP2:** To promote sustainable grid development by balancing complex and/or competing technical, economic, environmental, social and deliverability goals and priorities in decision-making.

**PDP3:** To ensure that grid development is carried out in an economically efficient manner, and seek derogation from the Utility Regulator when this is not possible.

### Planning and Consenting Policy

**PCP1:** To have regard to relevant legislation and guidelines in respect of planning and consenting of transmission infrastructure development projects, and make provision for any policies for the provision of transmission infrastructure set out in these documents.

**PCP2:** To have regard to precedent arising from decisions of the Competent Authorities, and of the High Court in Judicial Review of decisions, relating to the planning and consenting of transmission infrastructure development projects.

**PCP3:** To promote sustainable grid development by balancing complex and/or competing technical, economic and environmental goals and priorities in decision-making.

### Consultation and Engagement Policy

**CEP1:** To consult and engage with statutory and non-statutory stakeholders, including communities, landowners and the general public, at the earliest appropriate stage of a project's development.

**CEP2:** To recognise and develop the essential role that communities, landowners and other stakeholders play in transmission infrastructure development, and to engage with different stakeholders as appropriate during the life of a grid development project.

**CEP3:** To ensure consultation and engagement feedback is appropriately considered in decision making.

## 3.3 DESCRIPTION OF THE TRANSMISSION DEVELOPMENT PLAN FOR NORTHERN IRELAND 2018

### 3.3.1 Introduction

Table 3.1 below sets out the elements of the TDPNI and identifies those assessed as part of the SEA and why.

**Table 3.1: Proposed Elements of the TDPNI to be Assessed**

Section	Topic	Assessed in the HRA?
1	<b>Introduction</b>	<b>No</b> – This is an introduction to the TDPNI
2	<b>Strategy for Developing the Grid</b> - Describes SONI's approach to grid development	<b>No</b> – This is a description of the approach to grid development.
3	<b>General Approach to Developing the Grid</b> - Describes SONI's approach to scenario planning, planning standards, the Framework for Developing the Grid, and public planning and environmental considerations	<b>No</b> – This is a description of the approach to planning for grid development.
4	<b>Implementation</b> - Describes SONI's approach to the environment, project development, planning and consenting of projects, and consultation and engagement	<b>No</b> – This is a description of the approach to implementing future transmission projects.
5	<b>Investment Needs</b> - Describes the policy and technical drivers of network development	<b>No</b> – This is a description of the drivers for grid development.
6	<b>Planned Network Developments</b> - An overview of planned NI transmission projects	<b>Yes</b> – This outlines the potential upcoming transmission projects.
7	<b>Project Descriptions</b> - Descriptions of individual projects	<b>Yes</b> – This describes the potential upcoming transmission projects.
8	<b>Summary of Strategic Environmental Assessment</b> - Included mitigation and monitoring proposals.	<b>No</b> – This is a summary of how the SEA and HRA processes have influenced the TDPNI

### 3.3.2 Geographic Scope

The TDPNI is a national level Plan that will cover the electricity transmission system in Northern Ireland and will link into the transmission systems of Great Britain and the Republic of Ireland. While the TDPNI is primarily concerned with grid development projects in Northern Ireland, the draft TDPNI and associated environmental documents will have careful regard to any likely significant environmental effects of a transboundary nature. **Figure 2.1** demonstrates the geographical extent of the existing SONI electricity transmission system within Northern Ireland. The geographical scope of the SEA (i.e. the area with a potential to be impacted by the developments of the TDPNI) will be mainly within Northern Ireland, within the vicinity of proposed developments, however transboundary impacts to receptors in the Republic of Ireland will also be considered on a case by case basis. It is unlikely that the upgrading and development of the electricity transmission system in Northern Ireland will have any significant transboundary impacts upon Great Britain. Areas offshore of Northern Ireland may need to be taken into consideration in the environmental assessment of some of the proposed developments which have a potential for marine cabling and / or marine impacts. The study areas covered by the potential developments (alternatives) of the TDPNI are discussed further in **Section 6**.

### 3.3.3 Temporal Scope

The SONI TDPNI is proposed to cover the period from 2018 to 2028. Projects from the TDPNI that are likely to be progressed over the next 10 years will be detailed within the Plan. The TDPNI will be a rolling plan, which is updated annually as per licence requirements set out by the Utility Regulator. The SEA environmental reporting for the TDPNI will have a nominal life span of five years. While this is not a statutory obligation, every five years the relevant annual TDPNI will be reviewed for the purpose of undertaking a new SEA, if required. Each annual TDPNI subsequent to the 2018 Plan will contain an Environmental Appraisal to monitor the impacts of the TDPNI, in line with the adopted environmental monitoring from the SEA.

As the implementation of many of the projects outlined in the TDPNI 2018 - 2028 are on a supply and demand basis, there may be no specific timeframe for their development, or indeed if they are developed at all. The SEA of the TDPNI will assess these options for potential impacts in the short term - construction phase, the medium term – re-establishment and initial operational phase (0-5 years post construction) and the long term – operational phase (5 years onwards). There is no discussion provided on the decommissioning of any of the proposed developments, unless this is specifically part of the proposal. For note, for new lines and substations it would be assumed that any decommissioning of infrastructure, in line with all best practices and competent working, would have similar impacts to the short term construction phase impacts assessed in this report, and would look to provide no long term or permanent residual impact on a site.

## 3.4 PROPOSED OPTION DETAILS

The draft TDPNI has defined a list of the potential projects that could be developed within the Plan period up to 2028, which are summarised in Table 3.2. These projects can be summarised by the general development type, of which there are six groups:

- Asset Replacement Projects
- Renewable Generation Cluster Substations and New Connections
- Renewable Integration Developments
  
- Load Related and Security of Supply
- Fault Level Replacements
- Interconnection

**Table 3.2: Potential Projects arising from the TDPNI**

<b>Project</b>	<b>Description</b>
<b>Asset Replacement Projects</b>	
<b>Donegall Main (North) Transformer Replacement</b>	The 60 MVA transformer TxB at Donegall North is to be replaced by a new 90 MVA unit. Completion date: summer 2018.
<b>Coolkeeragh - Magherafelt 275 kV Circuits Restrung</b>	It is planned to replace the conductor on the existing double circuit tower line. The rating of the replacement conductor will be defined as part of the redesign of the circuit. Completion date: winter 2021.
<b>Ballylumford Switchgear Replacement</b>	The existing 110 kV switchgear at Ballylumford is to be replaced with a new 110 kV GIS double busbar and the 110 kV circuits diverted accordingly. Completion date: winter 2020.
<b>Castlereagh Inter-bus Transformer 1 Replacement</b>	The 275/110kV 240MVA interbus transformer IBTX 1 is to be replaced. Completion date: winter 2018
<b>Hannahstown Inter-bus transformer 1 and 2 replacement</b>	The 275/110 kV 240 MVA interbus transformer IBTX 1 and 2 are to be replaced. Completion date: TBA
<b>Tandragee Inter-bus Transformer 1 and 2 replacement</b>	The 275/110 kV 240 MVA interbus transformers IBTX 1 and 2 are to be replaced. Completion date: TBA
<b>Kells Inter-bus Transformer 1 and 2 Replacement</b>	The 275/110 kV 240 MVA interbus transformers IBTX 1 and 2 are to be replaced. Completion date: TBA
<b>Ballylumford Inter-bus transformer 1 and 2 Replacement</b>	The 275/110 kV 240 MVA interbus transformers IBTX 1 and 2 are to be replaced. Completion date: TBA
<b>Ballymena Main Transformer 3 and 4 Replacement</b>	The 110/33 kV transformers TX 3 and 4 at Ballymena Main are to be replaced. Completion date: TBA
<b>Enniskillen Main transformer 1 and 2 replacement</b>	The 110/33 kV transformers TX 1 and 1 at are to be replaced. Completion date: TBA
<b>Banbridge Main transformer 1, 2, 3 and 4 replacement</b>	The 110/33 kV transformers TX 1-4 at are to be replaced. Completion date: TBA
<b>Glengormley Main Tx B</b>	The 110/33 kV transformer Tx B is to be replaced. Completion date: TBA
<b>Shunt Reactors</b>	The TR1 and TR2 reactors at Kells and Tandragee 275 kV substations (respectively) are to be replaced by 2027. Completion date: 2027
<b>Strabane Main 110kV refurbishment</b>	The 110 kV mesh is to be refurbished. Consideration will also be given to the installation of a GIS switchboard at the alternative site. Completion date: TBA
<b>Limavady Main 110kV refurbishment</b>	The 110 kV mesh at Limavady Main is to be refurbished. Consideration will also be given to the installation of a GIS switchboard at the alternative site. Completion date: TBA
<b>Renewable Generation Cluster Substations and New Connections</b>	
<b>Curraghmulkin 110/33kV Cluster (formerly Drumquin)</b>	It is planned to establish a new 110/33 kV cluster substation close to Drumquin village. The Curraghmulkin cluster is to be connected to the existing Enniskillen - Omagh 110 kV circuits by means of a new switching station (Omagh South) north of Dromore village. A single portal overhead line will be built from the new station to the cluster site. Completion date: Summer 2018.

<b>Project</b>	<b>Description</b>
<b>Agivey 110/33 kV Cluster</b>	It is planned to establish a 110/33 kV cluster substation near Garvagh, connected to the proposed Rasharkin cluster via a portal overhead line. Completion date: Winter 2019.
<b>Kells Wind 110/33 kV Cluster</b>	It is planned to establish a 110/33 kV cluster substation near to Kells, connected to the existing Kells station via an overhead line. Completion date: winter 2020.
<b>Fair Head / Torr Head Tidal Scheme connection (approval pending)</b>	Developers are planning to establish two 100MW tidal generation schemes off the County Antrim coast close to Torr Head and Fair Head. A connection has not yet been formally offered but is assumed to involve a connection into Kells Main and construction of either a 275 kV circuit or 110 kV single or double circuit line. Completion date: TBA
<b>Belfast Power Station</b>	Evermore Energy are proposing a new 480 MW CCGT, to be located in Belfast Harbour Estate. The project is in the early stages of development, and no connection application has been received. Completion date: TBA
<b>Compressed Air Energy Storage Scheme connection (on hold)</b>	A developer has planned the construction of a Compressed Air Energy Storage facility close to Ballylumford Power station in Islandmagee. They had been offered a connection into Ballylumford at 275 kV but this offer has expired. It does, however, have PCI status. Completion date: TBA
<b>Renewable Integration Developments</b>	
<b>Omagh Main – Omagh South Uprate</b>	With the connection of Curraghmulkin cluster substation to Omagh South it will be necessary to restring the Omagh Main – Omagh South tower line with high temperature conductor. Completion date: summer 2019.
<b>Omagh Reactive Compensation</b>	It is planned to install reactive compensation equipment at Omagh Main. The reactive support will be connected to the 110 kV bus. Completion date: 2021.
<b>Tamnamore Reactive Compensation</b>	It is planned to install reactive compensation equipment at Tamnamore. The reactive support will be connected to the 110 kV bus. Completion date: 2021.
<b>Coleraine Reactive Compensation</b>	It is planned to install reactive support at Coleraine. The reactive support will be connected to the 110 kV busbar. The existing 36 Mvar capacitor will be recovered. Completion date: 2021.
<b>Kells/Creagh -Rasharkin New 110kV Circuit</b>	As a result of increasing growth in renewable generation there will be a need to construct a second 110 kV circuit between either Creagh or Kells, and Rasharkin 110 / 33 kV cluster substation. Completion date: winter 2024.
<b>Tamnamore – Turleenan Uprate</b>	Pending the establishment of Turleenan substation it is planned to uprate the conductors between Turleenan and Tamnamore 275kV substation. Completion date: winter 2022.
<b>Coolkeeragh – Trillick new 110 kV line (on hold)</b>	A need has been identified to strengthen the electricity network on both sides of the border in the north-west to assist in the integration of renewable power sources. This project is on hold and may be replaced by the North West Reinforcement but still has Project of Common interest (PCI) status. Completion date: TBA
<b>Turleenan- Omagh South – Co. Donegal new 275 kV line (on hold)</b>	A need has been identified to strengthen the electricity network on both sides of the border in the north-west to assist in the integration of renewable power sources. This project is on hold and may be replaced by the North West Reinforcement but still has

Project	Description
	Project of Common interest (PCI) Completion date: TBA
<b>North West of Northern Ireland Reinforcement</b>	As a result of increasing growth in renewable generation in the west there will be a need to construct a new circuit between the 275kV system and the 110 kV system electrically close to Coolkeeragh. A long list of options shall be narrowed down to a short list. The long list of main and supporting options at present includes the following: <ul style="list-style-type: none"> <li>• HVDC (subsea) link from Kilroot to Coolkeeragh;</li> <li>• New 275 kV or 110 kV circuit from Magherafelt to Coolkeeragh;</li> <li>• New 275 kV or 110 kV circuit from Magherafelt to Strabane (new substation);</li> <li>• 110 kV circuit from Agivey cluster – Limavady</li> <li>• Strabane – Omagh 110 kV Uprate</li> <li>• Coolkeeragh – Strabane 110 kV Uprate</li> <li>• Coolkeeragh – Killymallaght 110 kV Uprate</li> <li>• Coolkeeragh – Limavady 110 kV Uprate</li> <li>• Killymallaght – Strabane 110 kV Uprate</li> </ul> Completion date: TBA
<b>Load Related and Security of Supply</b>	
<b>Sydenham Road Main (new station)</b>	It is planned to construct a new 110/33 kV substation in the Belfast Harbour Estate, close to the existing Airport Road 33/6.6kV substation. The substation will be connected to the existing Rosebank substation via the existing 110 kV tower line (currently operated at 33kV) from Rosebank to Sydenham Road. Completion date: winter 2022.
<b>Ballylumford-Castlereagh 110 kV Circuit restrung</b>	The conductor on the existing tower line will be replaced and uprated. Completion date: winter 2020.
<b>Drumnakelly and Armagh Development Plan</b>	There is a need to reinforce the distribution system supplying Armagh city and the surrounding area. There is also a need to upgrade capacity at the existing Drumnakelly 110/33 kV substation. Options being considered include: <ul style="list-style-type: none"> <li>• Establishing a new 110/33 kV substation adjacent to the existing Drumnakelly Main along with associated 33 kV reinforcements to the Armagh area;</li> <li>• Establishing a new 110/33 kV substation at Armagh with new 110 kV circuits from Tandragee or Drumnakelly.</li> </ul> Completion date: TBA
<b>Castlereagh 275 kV new no. 4 inter-bus transformer (Capital approval pending)</b>	There is a need to provide additional capacity at Castlereagh to meet expected demand growth. Completion date: TBA
<b>Coolkeeragh T1 Transformer cabling uprate</b>	This project is to uprate the 110 kV cabling associated with Tx 1. Completion date: TBA
<b>Tandragee 110 kV 275 kV second busbar coupler</b>	This project is to install a second busbar coupler onto the existing 275 kV double busbar. Completion date: TBA
<b>Kells Remote Control</b>	This project is to replace the existing line end disconnectors with remote control motorised disconnectors. Completion date: TBA
<b>North West Special Protection Scheme upgrade</b>	This project is to replace and upgrade the existing special protection scheme. Completion date: TBA

<b>Project</b>	<b>Description</b>
<b>Enhancement to the low frequency load disconnection scheme</b>	It is planned to modify existing under-frequency automatic load shedding schemes. Completion date: TBA
<b>Augmentation of capacity at Transmission / Distribution interface</b>	It is planned to increase 110/33 kV transformer capacity at four substations; Coleraine, Strabane, Limavady and Omagh. This capacity will be increased either by uprating transformers or by the installation of an additional transformer. Completion date: TBA
<b>Fault Level Replacements</b>	
<b>Castlereagh and Tandragee 110 kV Switchgear replacement</b>	Due to increasing fault levels it is planned to replace 110 kV circuit breakers and current transformers at Castlereagh and Tandragee. Completion date: winter 2021.
<b>Castlereagh – Knock 110kV cables uprate</b>	The protection on this circuit will be replaced and uprated as well as the cable sealing ends and a section of cabling. Completion date: TBA
<b>Cregagh Transformer B switchgear replacement</b>	It is planned to replace a set of disconnectors and earth switches. Completion date: TBA
<b>Interconnection</b>	
<b>North-South Interconnector</b>	New 400 kV circuit from existing Woodland 400 kV station in County Meath (RoI) to a proposed 400/275 kV station at Turleenan in County Tyrone (NI). Completion date: winter 2020.

## 3.5 ELECTRICITY TRANSMISSION INFRASTRUCTURE

### 3.5.1 Overhead Lines

Overhead transmission lines comprise a *conductor* (aluminium or steel strand), suspended at a defined clearance height between a series of supporting structures; insulators prevent the current from crossing between the conductor and the structure.

Overhead lines can be constructed in *single circuit* or *double circuit* formations. The three phases of single circuit overhead lines are carried in the horizontal plane. Double circuits (wherein two separate circuits are supported on a single structure) generally only occur where two single circuit lines are in close proximity or where a route corridor is very constrained. The three phases of double circuit overhead lines are carried in the vertical plane. Additional earth (shield) wires may also be incorporated above the conductors in order to protect the overhead line from lightning strikes. Optical fibre may also be wrapped around the shield wire; this is used for communication purposes including controlling the power system.

#### 3.5.1.1 Structures

Conductors are typically supported on steel lattice towers or wooden pole sets. *Intermediate towers* occur along straight sections of an overhead line. *Angle towers* are used where a line changes direction and conductors must be held under tension. *Terminal towers* are generally constructed where an overhead line enters a substation but may also be used where there is an interface between an overhead line and an underground cable.

The design of structures required along an overhead line vary according to the voltage and can be dependent on the local environment in which they are situated as a result of variable terrain, ground conditions, required clearance from other infrastructure and other constraints. Table 3.3 summarises the various structure types utilised in the transmission network on the island of Ireland.

**Table 3.3: Transmission Network Structures**

Structure	Material & dimensions	Foundation	Spacing
<b>400 kV</b>	Lattice steel structures, concreted into the ground. Height typically ranges from 20m to 48m.	Four foundation blocks are excavated, each block ranging in diameter from 2.8m to 5.3m depending on the tower design (single or double circuit angle tower or double circuit intermediate tower).	Average span is 350m depending on local landscape features and topography.
<b>275 kV</b>	Lattice steel towers are also used to support 275 kV conductors in Northern Ireland and are built to the same standard as the 400 kV infrastructure described above.		
<b>220 kV</b>	Lattice steel structures, concreted into the ground. Height typically ranges from 27m to 37m.	Four foundation blocks are excavated, ranging in width from 1.4m to 3.9m depending on the tower design (single or double circuit angle tower or double circuit intermediate tower).	Average span is 320 m depending on local landscape features and topography.
<b>110 kV pole set</b>	Wooden pole sets consisting of two wooden poles, 5m apart and connected near the top with a rolled steel channel.  The wooden poles are typically between 16m and 23m in height.  Where an OHL angle less than 20 degrees is required, a braced pole set may be erected. These comprise a modified version of a standard pole set wherein the space between the poles is reinforced with steel	A minimum of 2.3m of pole is buried underground; no concreting around the base of the poles is carried out under normal ground conditions.  Wooden sleepers are affixed to the bases of the pole sets in a narrow (0.8m) excavation perpendicular with the overhead line alignment; this delivers improved stability.  Where ground conditions dictate, stay wires from the pole sets may also be required. This generally involves	Span between 110 kV structures ranges between 180 and 300m, depending on local landscape features and topography.

	members.  Three-pole intermediate pole sets may also be erected in certain cases, comprising a 5m spacing between poles.	excavation of four trenches (approximately 2m x 2m x 1.8m – 2m deep) at a distance of at least 10m from the pole set, though this distance can often be larger.  Pre-cast concrete stay blocks or wooden sleepers are placed at the base of these excavations and stay wires are affixed to them before the excavation is reinstated.	
<b>110 kV angle mast</b>	Where a change in conductor direction of more than 20 degrees is required, steel lattice towers are used. These are typically smaller in scale than the higher voltage versions and range in height, typically starting at 15m and increasing in increments of 3m extensions, depending on topography (smaller 12m masts can also be erected in some circumstances).	Concrete foundations are required for all steel towers, and pile foundations may be required in unstable ground.  The average foundation block size for each tower leg used in the 110 kV towers is 4m x 4m x 3m.	

For all transmission lines with earth (shield) wires, there is a requirement to install an earth ring or mat at the base of the structure to ground the structure for safety reasons. The ground around the base of the structure is excavated while the respective tower or pole set is being erected and the earth ring is subsequently installed before completion of works at the site.

### 3.5.1.2 Construction Methods

Transmission line construction, maintenance and decommissioning usually follow a standard sequence of activities. The duration of these activities for 110 kV transmission lines (wood pole support structures) is normally less than for higher voltage lines requiring lattice steel towers. The construction of high voltage transmission lines typically entails the following sequence of events:

1. Preliminary procedures including verification that planning conditions have been satisfied; pre-construction site investigations including an access review and assessment of ground conditions; delineation of on-site working area;
2. Establishment of temporary access routes and laydown/storage areas where necessary;
3. Setting out of tower foundations or pole excavations;
4. Installation of foundations as appropriate;
5. Erection of towers or pole sets;
6. Stringing of conductors and commissioning;
7. Reinstatement of land; and
8. Remove temporary access

### 3.5.1.3 Construction Access

To minimise environmental disturbance, access to individual structure locations is generally along the local public road network, with subsequent works access to private land using existing farm entrances and tracks wherever possible. Access routes are typically marked or fenced on site to keep disturbance to a minimum. Specific planning conditions relating to access routes may also apply.

Off-road access is assessed prior to works. In peatland areas, access is achieved by using wide tracked low ground pressure vehicles to minimise damage to ground, and in sensitive areas may be combined with bog mats made from timber (or other preformed matting such as aluminium or Ethylene Propylene Diene Monomer (EPDM) sheets). Where very soft ground is encountered, temporary access tracks may need to be constructed. Generally, temporary roads are constructed using stone; however in certain sensitive situations aluminium road panels may be used.

Stone road construction involves the stripping and preservation of surface curves followed by excavation of the topsoil and storage of this to one side of the track. Geotextile reinforcement is placed on the subsoil surface and approximately 200 mm of stone placed on top and compacted to form the track. Alternatively, in soft bog, a stone or panel road as described above may not be appropriate and in this case timber sleepers can be used.

Where extremely sensitive habitats occur or where access is particularly challenging, materials can be airlifted to the respective work site(s) using a helicopter.

#### 3.5.1.4 Refurbishment and Upgrading

Transmission lines are generally low maintenance utility infrastructure. Refurbishment works are generally required for transmission lines that have been in place for over 20 years. Refurbishment works may consist of a major overhaul of equipment, to rebuild or replace parts or components of a transmission asset to restore it to a required functional condition and extend its life. Refurbishment comprises the replacement of individual towers, pole sets, insulators or hardware at selected locations and the replacement or strengthening of selected angle tower foundations.

Existing transmission lines can also be upgraded to increase capacity or strengthen electrical resilience in the system. Upgrading involves the replacement of the overhead line / conductor with a more efficient conductor of the same voltage and usually involves the replacement of a significant number of support structures as the new conductor may be heavier than the original.

In general, the work associated with refurbishment and upgrading of transmission lines can include some or all of the following:

1. Fittings replacement – this involves removal of existing fittings, followed by installation of new fittings. These include smaller scale items such as brackets, insulators and clamps.
2. Replacement of crossarm and fittings – this involves removal of crossarm and fittings, followed by installation of new crossarm and fittings (110 kV only).
3. Replacement of intermediate pole set structures - this involves removing all associated fittings, stays (where present), cutting and removal of the poles, followed by installation of new poles, stays, crossarm and fittings.
4. Replacement of steel towers - this involves the removal of the existing structure and all associated fittings, and the removal of the existing foundations, followed by the installation of new foundations and construction of new structure and installation of fittings.
5. Replacing the conductor - this involves re-stringing by pulling the conductor between the angle masts, with the main element of this work carried out at angle masts, with some work also carried out at strain and semi-strain locations during conductor stringing (upgrading).
6. Other ancillary works - such as guard posts for road crossings, diversions of lower voltage lines, erection of temporary structures etc.

In some instances, intrusive site investigation works are required to determine the level of work required as part of an upgrade or a line refurbishment. The foundations of existing towers often require assessment. This is typically undertaken using *dynamic probing*, which is a penetration test which provides information on the geo-technical properties of the ground around a structure. In addition, a partial excavation of one or more tower legs may be required to determine the suitability of the existing tower.

### 3.5.1.5 Construction Resources

Table 3.4 outlines the types of structures and equipment typically used during the construction, upgrading or refurbishment of overhead transmission lines. An illustrative guide to the construction of 400 / 275 / 220 kV towers is presented in Figure 3.2.

## 3.5.2 Underground cables

### 3.5.2.1 Construction methods

High voltage (HV) circuits can only be laid underground using special HV cables designed specifically for underground use. The conductors in underground HV cables must be heavily insulated to avoid a short circuit between the conductor and the ground around the cable.

Cables are installed directly into the ground in an excavated trench. Typically, high voltage cable routes are located along public roads and open spaces. In some instances a cable route may be required to cross private open ground.

Transmission cable routes comprise sections of cable that are connected using a cable joint. Cable joints are installed in *joint bays* which are typically concrete structures buried underground, occurring generally every 500 - 700 m along an alignment, and ranging in size up to 6 m long, 2.5 m wide and 1.8 m deep.

Once installed, the road surface is reinstated. Where a cable route is in an open area, it is returned to agricultural/grassland use. Where a cable passes through forested land the route is not replanted with trees to prevent any damage to the cable by tree root growth.

### 3.5.2.2 Watercourse crossings

Where cable routes transect watercourses, specific crossing methods require implementation. In cases where the cable is being trenched along the public road and there is adequate overburden in the deck of the bridge at the point of crossing, it is generally feasible to continue the cable over the bridge without any need for off-road or in-stream works.

Where the above approach cannot be facilitated, the remaining options are *open-cut* trenching across the bed of the river or trenchless technology wherein a cable duct is installed at a defined depth under the river bed without any requirement for disturbance to the water column or bed substrate

Open cut crossings are typically achieved by damming and pumping/fluming of the water flow around the trench excavation. As this work involves direct in-stream works, it should be scheduled for the period of July - September, in line with the relevant fisheries guidelines.

Open cut trenching requires a temporary dewatering of a section of the watercourse via upstream and downstream damming of a defined stretch with sandbags so as to ensure that all works are undertaken 'in the dry'; this should be carried out in line with the relevant fisheries guidelines. It may be necessary to temporarily remove fish from the reaches involved, using electrofishing equipment which should only be undertaken by relevant fisheries staff or qualified aquatic ecologists.

Water is diverted from upstream to downstream of the cable crossing location by means of a secure open flume arrangement, or through piping, or in limited circumstances, by means of over pumping. Screening to prevent aquatic organisms entering pumps is a requirement in the case of the latter option. Where concrete ballast is used to prevent cable ducts rising as a result of buoyancy, these should comprise precast concrete. Following the completion of backfilling, river bed and banks shall be reinstated to match their original profile and substrate material. These works are temporary in nature and are typically limited to 1-2 days.

**Table 3.4: Summary of works and resources involved in the construction, uprating and refurbishment of overhead line infrastructure**

	Works	Summary	Plant required for construction
Construction	<b>275 kV tower construction</b>	<p>Design: The height range of towers is generally between 20 m and 52 m depending on topography. The maximum width of the towers at ground level ranges from 7 m to 12 m. The average span between towers is on average approximately 350 m, dependent on local topography.</p> <p>Foundation: There are 4 concrete foundations installed per steel structure. Foundation size and type is dependent on ground conditions and tower type, but is typically 2.8 to 5.3 m in width for each foundation pad. The base installation time is approximately one week. A larger footing may be required in the case of weak soils, while pile foundations can be used in the case of deep peat. In the case of rock being encountered at shallow depths, reduced footing size foundations may be required. Shear blocks (i.e. a protective concrete neck around the base of tower legs) are poured once the main foundations are in-situ.</p> <p>Erection: Towers are generally constructed using a 'derrick pole' or a mobile crane. The derrick pole methodology is a simple system wherein small sections of steel are lifted into place using the derrick pole and a winch. The derrick pole consists of either a solid or lattice aluminium or steel pole which is held in position using guy ropes anchored to the ground. The crane-based procedure entails the tower being completed in separate sections due to the weight of the differing components. Tower sections are assembled on the ground and subsequently lifted into place.</p>	Transit van 4x4 vehicle Winch tractor Tractor and trailer Crane/Derrick pole Teleporter Chains and other small tools Concrete vibrator Water pump Wheeled/ track dumper Excavator Concrete trucks
	<b>220 kV tower construction</b>	<p>Design: The height range of towers is generally between 20 m and 40 m depending on topography. The maximum width of the towers at ground level ranges from 6 m to 12 m. The average span between towers is on average approximately 320 m, dependent on local topography.</p> <p>Foundation &amp; Erection: Broadly similar to 400 kV specifications and construction method. There are 4 concrete foundations installed per steel structure. Foundation size and type is dependent on ground conditions and tower type, but is typically 1.4 m to 3.8 m in width for each foundation pad.</p>	As for 400 kV
	<b>110 kV pole set construction</b>	<p>Design: The height range of pole sets is generally between 16 m and 23 m depending on topography. The maximum width of the pole sets at ground level ranges from 4 m to 9.8 m. The span between pole sets can range from 180 m to 300 m, dependent on local topography.</p> <p>Installation: An excavation of a minimum of 2.3 m for each pole will be carried out using a wheeled or tracked excavator. Each of the two poles are lined up with the excavated holes and the machine operator then drives forward pushing the pole up until the pole is in an almost vertical position. The pole is supported at all times and the holes manually backfilled to a minimum depth of 1 m. After excavation and erection of the pole set, a further excavation 0.8 m deep is necessary. This is a linear excavation perpendicular to the line necessary to install wooden sleepers. These sleepers add additional stability to the pole set and are attached to the pole set using a u-bolt.</p>	Transit van Excavator Winch tractor/pole erector Chains and other small tools
	<b>110 kV pole set stays</b>	Under certain ground conditions, stay wires may be required at some pole set locations to provide stability to the structure. These wires add stability to the pole and are supported by means of stay blocks and/or timber sleepers. The stay blocks are made of concrete and are buried underground, as are the timber sleepers should they be employed. Stay foundations are installed at a distance of at least 10 m from the pole set, though this distance can often be larger.	As for 110 kV pole set construction
	<b>110 kV angle tower construction</b>	Refer to 220 kV; towers are smaller in scale, with a height range of 18 m to 24 m.	As for 400 kV tower construction

	Works	Summary	Plant required for construction
Refurbishment / Uprating	<b>Replace fittings</b>	Fittings, insulators (where required) and equipment can be transported to site without the use of heavy equipment.	(Tracked) Quad bike and / or buggies Chains and other associated tools
	<b>Replace crossarm and fittings</b>	Crossarms link the wooden pole sets and the fittings and conductor are attached to the crossarm. They are long heavy metal structures and their removal requires a mobile elevated work platform (MEWP) and tracked excavator to provide a safe working platform.	4 x 4 vehicle (not used within sensitive areas) Mobile elevated work platform (MEWP) (Tracked) quad bike / buggy Tracked excavator (also used to carry in/out new/old crossarm) Chains and other associated tools.
	<b>Replace intermediate pole set structures</b>	The replacement of wooden pole sets is undertaken in situ with the replacement structures erected immediately adjacent to the original structure. Once the conductor has been removed from the old pole set and moved on the new support, the two original wood poles are cut at ground level and removed from site. Alternatively, the old poles may be fully removed from the ground with the new poles being installed in the same position.	2 no. 360° tracked excavator Winch Tractor Quad bike
	<b>Replace angle mast structures</b>	Requires temporary installation of wooden pole sets to accommodate conductor (see above). Excavation and replacement of lattice tower and foundations then proceeds (refer to 400 kV construction).	Refer to 400 kV
	<b>Replacing the conductor</b>	Stringing of the conductor is undertaken in sections between end mast and angle mast or between angle masts. Stringing normally requires the placement of puller tensioners outside the span of the line section. A variation of this can occur when the location of the puller tensioner is constrained by environmental or ground conditions. In such cases back stringing is utilised. This is where one puller tensioner is located in the span area rather than outside it. The methodology involves connecting the new conductor to the existing conductor using stringing stockings and pulling out through the section in question. The methodology involves the pulling of a light pilot line (nylon rope) which is normally carried by hand into the stringing wheels. This in turn is used to pull a heavier pilot line (steel rope) which is subsequently used to pull in the conductors from drum stands using specifically designed 'puller-tensioner' machines. The temporary working areas utilised for the stringing equipment are generally 20 m x 20 m. Once the conductor has been pulled into position, one end of the straight is terminated on the appropriate tension fittings and insulator assemblies. The free end of the straight is then placed in temporary clamps (referred to as 'come-alongs') which take the conductor tension. The conductor is then cut from the puller-tensioner and the conductor is sagged using a chain hoist. The conductor is kept clear of all obstacles along the straight by applying sufficient tension. Certain obstacles along a straight have to be	4x4 vehicles Puller - tensioner X 2 Teleporter X 2 Drum stands X 2 Drum carriers X 2 Stringing wheels Conductor drums Compressor & head Transit vans Chains and other small tools Conflict guardings

	Works	Summary	Plant required for construction
		<p>guarded such as road/railway crossings and other transmission or distribution lines. Before removal in such cases, the conductor must be terminated at each end before being clamped in on either side of the obstacle crossing.</p> <p>Once the conductor is connected to the angle masts the temporary poles are then removed.</p>	
Access to works Areas	<b>Tower &amp; pole set construction</b>	<p>Excavators are generally tracked to reduce likely damage to and compaction of the ground. In addition a temporary hard standing may be required for machinery and this may require the removal of topsoil.</p> <p>Bog mats, either of timber, aluminium or rubber construction are used to access structures in poor ground conditions or in ecologically sensitive areas.</p> <p>At some locations, temporary roads with stone or wooden sleepers may need to be constructed. This involves the excavation of the topsoil and storage of this to one side of the track; surface turves are preserved for later reinstatement. A geotextile reinforcement is placed on the subsoil surface and stone placed on top and compacted to form the track. All material for temporary tracks is removed following completion of works.</p> <p>Materials required for construction are transported around the site by general purpose cross country vehicles with a lifting device.</p>	
	<b>Refurbishment &amp; uprating</b>	<p>Machinery access protocol as for construction above.</p> <p>In the case of replacement of fittings, where no specific machinery is required, works crews access site on quad bikes (tracked on soft ground) or on foot.</p>	

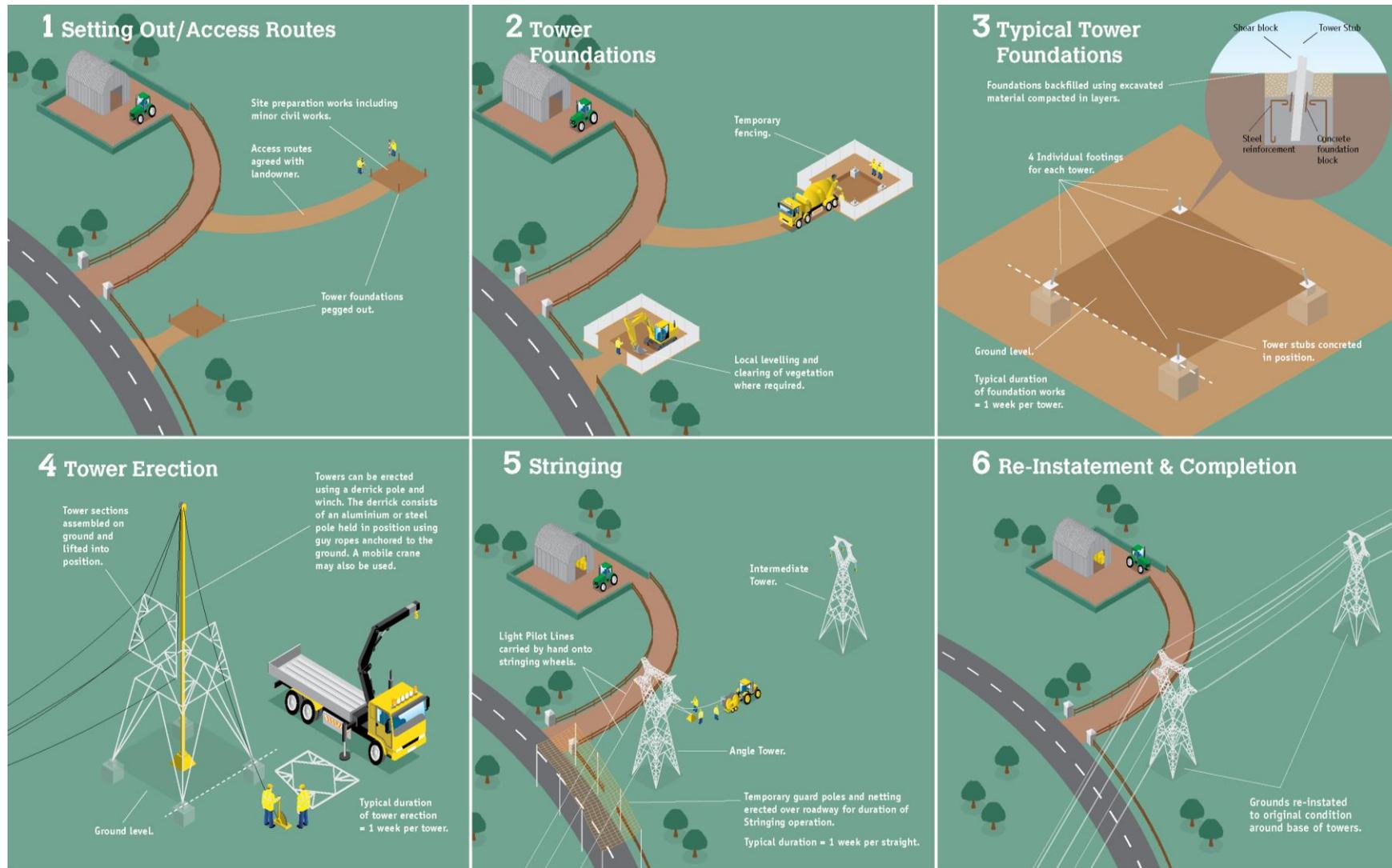


Figure 3.2: Graphic Guide to Transmission Tower Construction

Horizontal Directional Drilling (HDD) is a trenchless technology, which can be undertaken in a relatively confined area, such as on or adjacent to a public road or parallel to a bridge, therefore minimising the degree of off-road works required at watercourse crossings. Additionally, works do not have to be restricted to the July - September window which applies to the open cut method.

A drilling rig is established at a 'launch pit' on one side of a watercourse, from where it drills along a curved profile under the bed of the watercourse, and subsequently to a 'reception pit' on the far side. A reaming head and toe clamp is then attached to the leading drill rod, which then returns to the drilling rig, widening the bore and pulling the cable duct along in the process. The launch pit for the drilling rig typically requires the temporary installation of a level hardstanding area on a geotextile base; the footprint of this working area can vary from site to site but on average is typically 10 m x 10 m. Silt fences are erected between the launch and reception pits and the watercourse. During drilling, lubricant fluid is pumped into the bore from a bowser/mixing unit which is typically retained within a vehicle on the public road or on level ground set back from the watercourse. Specific non-toxic drilling lubricants are available for use under watercourses.

### 3.5.3 Substations

Substations connect two or more transmission lines; they take the electricity from the transmission lines and transform higher to lower voltage, or vice versa. They contain various electrical equipment, including voltage switches, transformers, protection equipment, and associated lines and cabling.

The siting of a substation depends on topography; the ground must be suitable to meet technical standards. With regard to earthing requirements and soil stability, substations are usually constructed on reasonably level ground, in areas that are not liable to flooding or crossed by significant watercourses.

An Air Insulated Switchgear (AIS) substation is where the electrical equipment infrastructure is primarily installed outdoors, with the use of natural air as insulation between circuits. This option requires a relatively large compound footprint (e.g. a typical 400 kV AIS substation compound may occupy up to 4-5 hectares, excluding surrounding access and landscaping).

A Gas Insulated Switchgear (GIS) substation, is where gas (Sulphur Hexafluoride – SF<sub>6</sub>) is used as the insulation between circuits. This requires the electrical equipment to be contained internally, in buildings typically 11m – 13m in height above ground. This allows for a significantly smaller substation footprint (e.g. a GIS substation with the same capacity as the 400 kV AIS substation above would occupy approximately 1 hectare, excluding surrounding access and landscaping). Both options require the associated provision of access roads off and onto the public road network and the provision of associated electrical equipment and infrastructure (including underground cables). Surface water drainage infrastructure from buildings and other substation elements is also installed. In the case of oil-filled transformers, these are constructed on banded plinths comprising water pumps with oil sensors which deactivate pumping when oil is detected.

Ancillary waste water treatment facilities, palisade fencing around boundaries and other site development and landscaping works also occur during the development of substations. These should therefore be considered significant civil engineering projects.

## 4 SCREENING FOR APPROPRIATE ASSESSMENT

### 4.1 EUROPEAN SITES

Qualifying Interests of the European sites in Northern Ireland are listed in Table 4.1. Special Protection Areas (SPAs) in the zone of influence of the TDPNI are described in Table 4.1 and illustrated in Figure 4.1. Special Areas of Conservation (SACs) in the zone of influence of the TDPNI are described in Table 4.1 and illustrated in Figure 4.2. Ramsar sites in the zone of influence of the TDPNI are described in Table 4.1 and illustrated in Figure 4.3. These figures include the spatial extent of the potential projects that may fall out from the TDPNI, and a 15km buffer around them. A distance of 15km is recommended in the case of plans, and derives from UK guidance (Scott Wilson *et al.*, 2006). This zone of influence has been adopted in the report.

#### 4.1.1 Conservation Objectives

The conservation objectives for each site are to 'maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing;
- 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.

The favourable conservation status (or condition, at a site level) 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;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

### 4.2 ESTABLISHING AN IMPACT PATHWAY

The possibility of significant effects is considered in this report using the source-pathway-receptor model. 'Source' is defined as the individual elements of the proposed works that have the potential to affect the identified ecological receptors. 'Pathway' is defined as the means or route by which a source can affect the ecological receptor. 'Ecological receptor' is defined as the Qualifying Interests for which conservation objectives have been set for the European sites being screened. Each element can exist independently however an effect is created when there is a linkage between the source, pathway and receptor.

Possible direct and indirect effects are discussed under three themes:

- Habitat Loss
- Water quality and habitat deterioration
- Disturbance and Displacement

As noted in Table 3.2, the draft TDPNI contains 44 no. potential projects that could be developed within the Plan period up to 2028, which are grouped into six general development types. Table 4.2 summarises those potential

projects for which an impact pathway can reasonably be anticipated. Table 4.3 links the potential projects with European sites for which a Likely Significant Effect might arise as a result of the impact pathway.

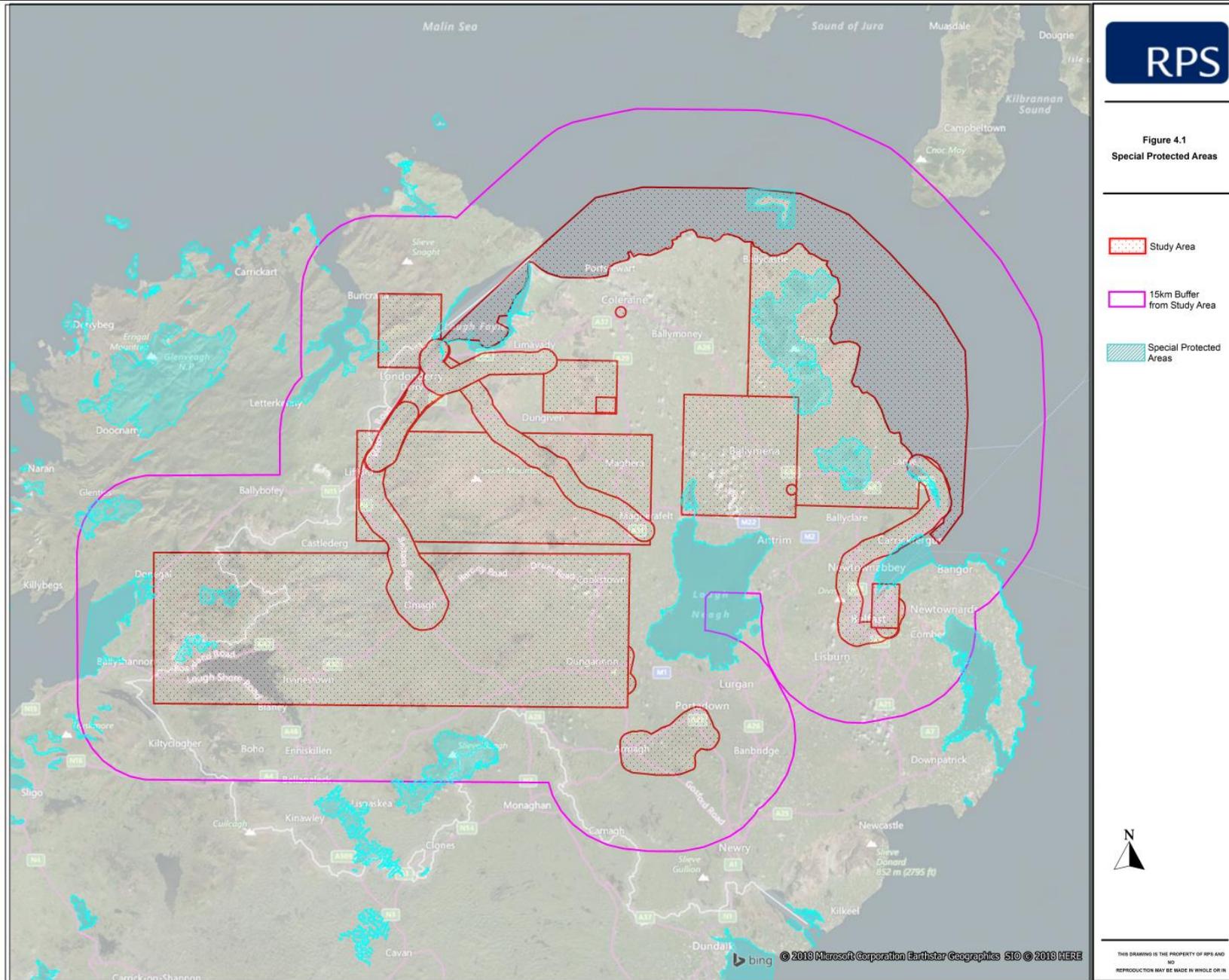


Figure 4.1: Special Protection Areas in the zone of influence of the TDPNI

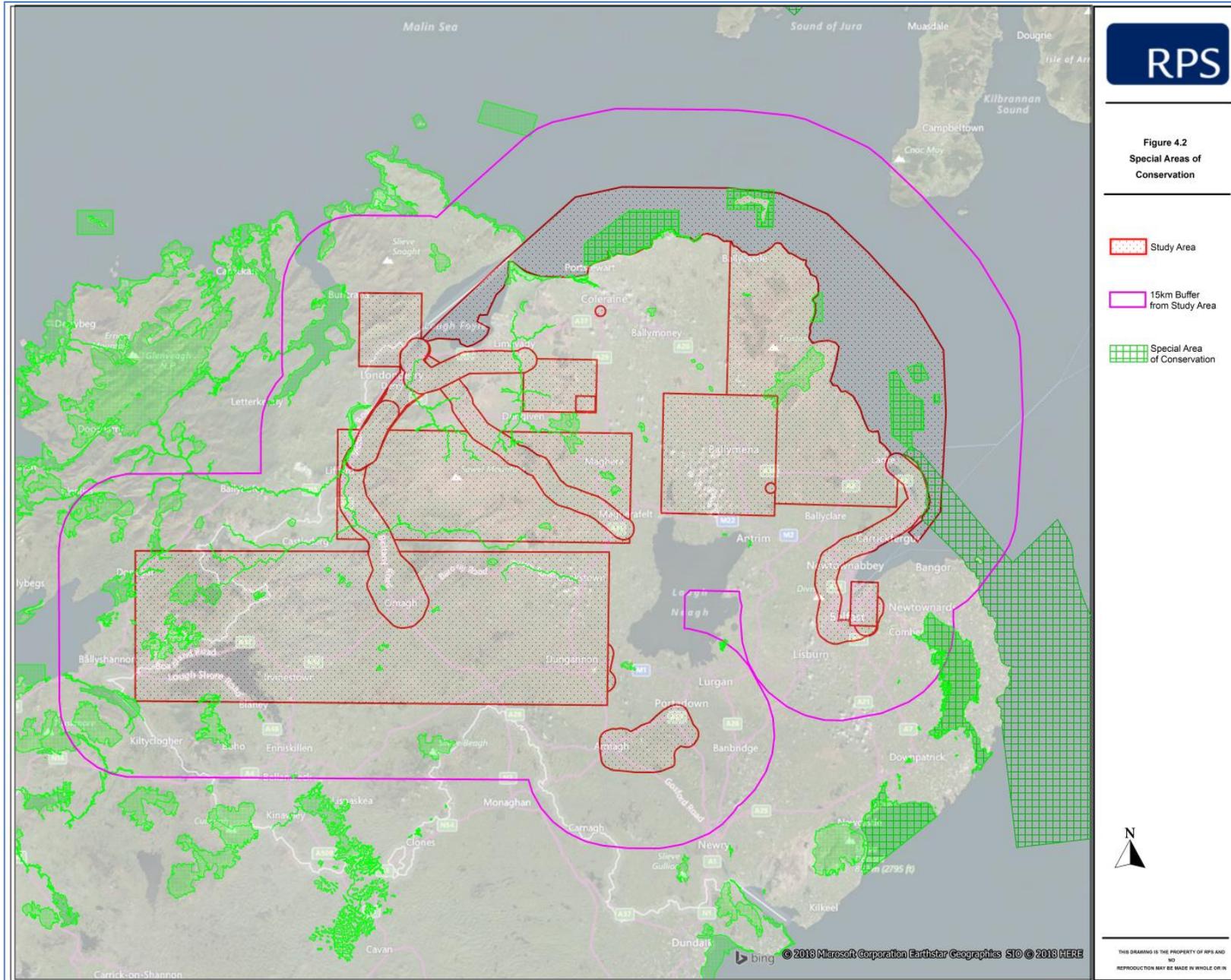


Figure 4.2: Special Areas of Conservation in the zone of influence of the TDPNI

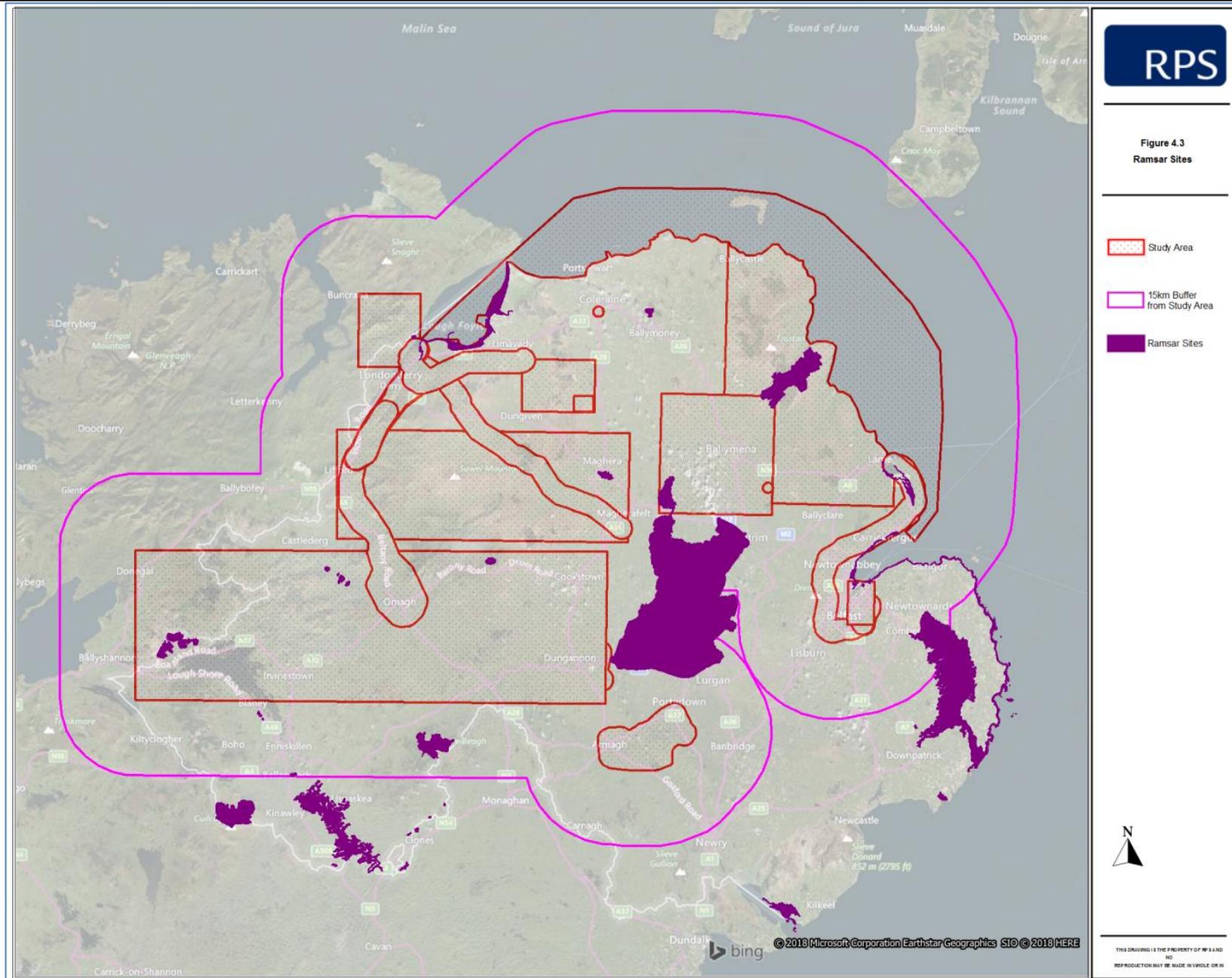


Figure 4.3: Ramsar sites in the zone of influence of the TDPNI

### 4.2.1 Habitat Loss

Loss or reduction in habitat area may occur where construction of facilities such as substations and infrastructure such as transmission lines and access roads are built within or close to the boundaries of a European site. Habitat loss associated with the installation of new transmission lines would be confined to tower/pole bases. Hydrological or drainage effects may occur where towers and poles are located in wetland and peatland habitats. Peat soils and peatland habitats can be the most impacted habitat type to be affected in this way and the slowest to recover.

### 4.2.2 Water quality and habitat deterioration

Construction of some of the potential TDPNI projects may lead to pollution of downstream surface waters, bringing about a change in key indicators of conservation value such as decrease in water quality and deterioration of downstream wetland habitats in European sites. Changes in water quality are mainly caused by construction and/or ongoing maintenance and could cause direct or indirect effects. Any of the following would have deleterious effects on fish, plants and invertebrates if allowed to enter watercourses:

- Suspended sediment due to runoff of soil from construction areas
- Raw or uncured concrete and grouts
- Fuels, lubricants and hydraulic fluids for equipment used in construction

### 4.2.3 Disturbance and Displacement

Construction or operation of some of the potential TDPNI projects may lead to disturbance to key species of protected mammal and birds (e.g. Otter or Whooper swan), particularly during construction and maintenance of transmission lines. In the marine environment, laying of cables could give rise to underwater noise causing disturbance to cetaceans or pinniped species.

Transmission lines in particular can impact negatively on birds, leading to fragmentation of species range and reduction in density. Powerlines can create a collision and/or electrocution risk for some bird species where flight lines cross route corridors. Migrating birds flying at heights of 20-50m are at considerable risk of collision at night and in poor weather, when flying in flocks, particularly large and heavy birds of limited manoeuvrability. Disturbance and displacement effects include:

- Disturbance to key species
- Habitat or species fragmentation
- Reduction in species density

**Table 4.1: Conservation objectives and Qualifying Interests of European sites the zone of influence of the TDPNI**

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK0030083	Banagher Glen SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/15)</p> <p>To maintain (or restore where appropriate) the following features to favourable condition:</p> <p>Annex I Habitats</p> <ul style="list-style-type: none"> <li>Northern Atlantic wet heaths with <i>Erica tetralix</i> [H4010]</li> <li><i>Tilio-Acerion</i> forests of slopes, screes and ravines [H9180]</li> <li>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [H91A0]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>Otter (<i>Lutra lutra</i>) [S1355]</li> </ul>
UK0030360	River Roe & Tributaries SAC	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (27/07/17)</p> <p>To maintain (or restore where appropriate) the following features to favourable condition:</p> <p>Annex I Habitats</p> <ul style="list-style-type: none"> <li>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</li> <li>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [H91A0]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>Atlantic Salmon <i>Salmo salar</i> [1106]</li> <li>Otter (<i>Lutra lutra</i>) [S1355]</li> </ul>
UK0030361	River Faughan & Tributaries SAC	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (27/07/17)</p> <p>To maintain (or restore where appropriate) the following features to favourable condition:</p> <p>Annex I Habitats</p> <ul style="list-style-type: none"> <li>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [H91A0]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>Atlantic Salmon <i>Salmo salar</i> [1106]</li> <li>Otter (<i>Lutra lutra</i>) [S1355]</li> </ul>
UK0030084	Bann Estuary SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/15)</p> <p>To maintain (or restore where appropriate) the following features to favourable condition:</p> <p>Annex I Habitats</p> <ul style="list-style-type: none"> <li>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</li> <li>Atlantic salt meadows (<i>Glauco – Puccinellietalia maritimae</i>) [1330]</li> <li>Embryonic shifting dunes [2110]</li> <li>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</li> </ul>
UK0016606	Garron Plateau SAC	<p><a href="#">Conservation Objectives Specific Version 2.1</a> (12/10/2017)</p> <p>To maintain (or restore where appropriate) the following features to favourable condition:</p> <p>Annex I Habitats</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>Blanket bogs (*if active bog)[7130]</li> <li>Alkaline fens [7230]</li> <li>Oligotrophic to mesotrophic standing water with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea [3130]</li> <li>Natural dystrophic lakes and ponds [3160]</li> <li>Northern Atlantic wet heaths with Erica tetralix [4010]</li> <li>Transition mires and quaking bogs [7140]</li> </ul> Annex II Species <ul style="list-style-type: none"> <li>Marsh saxifrage <i>Saxifraga hirculus</i> [1528]</li> </ul>
UK0030365	Red Bay SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>Sandbanks which are slightly covered by sea water all the time [1110]</li> </ul>
UK0030097	Breen Wood SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</li> <li>Bog woodland [91D0]</li> </ul>
UK0030384	The Maidens SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>Reefs [1170]</li> <li>Sandbanks which are slightly covered by sea water all the time [1110]</li> </ul> Annex II Species <ul style="list-style-type: none"> <li>Grey seal <i>Halichoerus grypus</i> [1364]</li> </ul>
UK0030321	Cranny Bogs SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>Active raised bogs [7110]</li> </ul>
IE002287	Lough Swilly SAC	<a href="#">Conservation Objectives Specific Version 1.0</a> (19/07/2011) To maintain the favourable conservation condition of the following: Annex I Habitats <ul style="list-style-type: none"> <li>Estuaries [1130]</li> <li>*Coastal Lagoons [1150]</li> <li>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles Annex II Species</li> <li>• Otter <i>Lutra lutra</i> [1355]</li> </ul>
UK0016613	Magilligan SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>• Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</li> <li>• Dunes with <i>Salix repens</i> ssp. <i>argenta</i> (<i>Salicion arenariae</i>) [2170]</li> <li>• Humid dune slacks [2190]</li> <li>• Embryonic shifting dunes [2110]</li> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>• Marsh Fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i> [1065]</li> <li>• Petalwort [1395] <i>Petalophyllum ralfsii</i></li> </ul>
UK0030383	Skerries and Causeway SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>• Sandbanks which are slightly covered by sea water all the time [1110]</li> <li>• Reefs [1170]</li> <li>• Submerged or partially submerged sea caves [8330]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>• Harbour porpoise <i>Phocoena phocoena</i> [1351]</li> </ul>
UK0030224	North Antrim Coast SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>• Annual vegetation of drift lines [1210]</li> <li>• Atlantic salt meadows (<i>Glauco – Puccinellietalia maritimae</i>) [1330]</li> <li>• Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</li> <li>• Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</li> <li>• Species-rich <i>Nardus</i> grasslands, on silicious substrates in mountain areas (and substation areas in Continental Europe) [6230]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>• Narrow-mouthed whorl snail <i>Vertigo angustior</i> [1014]</li> </ul>
UK0030055	Rathlin Island SAC	<p><a href="#">Conservation Objectives Specific Version 3.1</a> (13/10/2017) To maintain (or restore where appropriate) the following features to favourable condition:</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Annex I Habitats <ul style="list-style-type: none"> <li>• Reefs [1170]</li> <li>• Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]</li> <li>• Submerged or partially submerged sea caves [8330]</li> <li>• Sandbanks which are slightly covered by sea water all the time [1110]</li> <li>• Annual vegetation of drift lines [1210]</li> </ul>
UK0030320	River Foyle & Tributaries SAC	<a href="#">Conservation Objectives Specific Version 3.0</a> (27/07/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho – Batrachion vegetation [3260]</li> </ul> Annex II Species <ul style="list-style-type: none"> <li>• Atlantic salmon <i>Salmo salar</i> [1106]</li> <li>• Otter <i>Lutra lutra</i> [1355]</li> </ul>
UK0030326	Tully Bog SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (10/07/2018) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Active Raised Bogs [7110]</li> </ul>
UK0030233	Owenkillew River SAC	<a href="#">Conservation Objectives Specific Version 3.0</a> (27/07/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho – Batrachion vegetation [3260]</li> <li>• Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</li> <li>• Bog woodland [91D0]</li> </ul> Annex II Species <ul style="list-style-type: none"> <li>• Freshwater pearl mussel <i>Margaritifera margaritifera</i></li> <li>• Atlantic salmon <i>Salmo salar</i> [1106]</li> <li>• Otter <i>Lutra lutra</i> [1355]</li> </ul>
UK0016608	Teal Lough SAC	<a href="#">Conservation Objectives Specific Version 2.1</a> (13/10/2017) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Blanket Bogs (*if active bog) [7130]</li> </ul>
UK0030322	Curran Bog SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition:

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Annex II Species <ul style="list-style-type: none"> <li>• Active raised bogs [7110]</li> <li>• Degraded raised bogs still capable of natural regeneration [7120]</li> </ul>
UK001659	Ballynahone Bog SAC	<a href="#">Conservation Specific Objectives Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following feature to favourable condition: Annex II Species <ul style="list-style-type: none"> <li>• Active raised bogs [7110]</li> </ul>
UK0030110	Carn-Glenshane Pass SAC	<a href="#">Conservation Objectives Specific Version 2.1</a> (10/10/2017) To maintain (or restore where appropriate) the following feature to favourable condition: Annex II Species <ul style="list-style-type: none"> <li>• Blanket bogs (*if active bog) [7130]</li> </ul>
UK0030399	North Channel cSAC	<a href="#">North Channel</a> cSAC Annex II Species <ul style="list-style-type: none"> <li>• Harbour Porpoise (<i>Phocoena phocoena</i>)[1351]</li> </ul>
UK0016618	Strangford Lough SAC	<a href="#">Conservation Objectives Specific Version 3.0</a> (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Mudflats and Sandflats not covered by seawater at low tide [1140]</li> <li>• Coastal Lagoons [1150]</li> <li>• Large shallow inlets and bays [1160]</li> <li>• Reefs [1170]</li> </ul> Annex II Species <ul style="list-style-type: none"> <li>• Harbour Seal (<i>Phoca vitulina</i>)[1365]</li> </ul>
UK0030045	Largalunny SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</li> </ul>
UK0016609	Black Bog SAC	<a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Active Raised Bogs [7110]</li> </ul>
UK0016607	Pettigoe Plateau SAC	<a href="#">Conservation Objectives Specific Version 2.1</a> (13/10/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats <ul style="list-style-type: none"> <li>• Natural dystrophic lakes and ponds [3160]</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>Blanket Bogs [7130]</li> <li>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i> [3130]</li> <li>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</li> <li>European dry heaths [4030]</li> </ul>
UK0030324	Deroran Bog SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>Active Raised Bogs [7110]</li> </ul>
UK0016611	Fairy Water Bogs SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>Active Raised Bogs [7110]</li> </ul>
UK0030325	Toonagh Beg Bog SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>Active Raised Bogs [7110]</li> </ul>
UK0016619	Monawilkin SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)</li> <li>Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</li> </ul>
UK0030047	Lough Melvin SAC	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats</p> <ul style="list-style-type: none"> <li>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflora</i> and/or of the <i>Isoet-Nanojuncetea</i> [3130]</li> <li>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caeruleae</i>) [6410]</li> <li>Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</li> </ul> <p>Annex II Species</p> <ul style="list-style-type: none"> <li>Salmon (<i>Salmo salar</i>) [1106]</li> </ul>
IE0000623	Ben Bulbin, Gleniff and Glenade Complex SAC	<p><a href="#">Conservation Objectives</a> (21/02/2018) To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</li> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>• European dry heaths</li> <li>• Alpine and Boreal heaths</li> <li>• <i>Juniperus communis</i> formations on heaths or calcareous grasslands</li> <li>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)</li> <li>• Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)</li> <li>• Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels</li> <li>• Transition mires and quaking bogs</li> <li>• Petrifying springs with tufa formation (<i>Cratoneurion</i>)</li> <li>• Alkaline fens</li> <li>• Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</li> <li>• Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)</li> <li>• Calcareous rocky slopes with chasmophytic vegetation</li> <li>• Geyer's Whorl Snail <i>Vertigo geyeri</i></li> <li>• Otter <i>Lutra lutra</i></li> </ul>
IE0001403	Arroo Mountain SAC	<p><a href="#">Conservation Objectives</a> (31/08/2016) To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>• European dry heaths</li> <li>• Alpine and Boreal heaths</li> <li>• Blanket bogs (* if active bog)</li> <li>• Petrifying springs with tufa formation (<i>Cratoneurion</i>)</li> <li>• Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)</li> </ul> <p>Calcareous rocky slopes with chasmophytic vegetation</p>
IE0000428	Lough Melvin SAC	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i></li> <li>• Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</li> <li>• Salmon <i>Salmo salar</i></li> <li>• Otter <i>Lutra lutra</i></li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
IE0001976	Lough Gill SAC	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>)</li> <li>• Natural eutrophic lakes with Magnopotamion or <i>Hydrocharition</i> - type vegetation</li> <li>• Old sessile oak woods with Ilex and Blechnum in the British Isles</li> <li>• Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)</li> <li>• White-clawed Crayfish <i>Austropotamobius pallipes</i></li> <li>• Sea Lamprey <i>Petromyzon marinus</i></li> <li>• River Lamprey <i>Lampetra fluviatilis</i></li> <li>• Salmon <i>Salmo salar</i></li> <li>• Otter <i>Lutra lutra</i></li> </ul>
IE0023030	Dunmuckrum Turloughs SAC	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Turloughs</li> </ul>
IE0000138	Durnesh Lough	<p><a href="#">Conservation Objectives</a> (05/10/2016)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Coastal lagoons</li> <li>• Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</li> </ul>
IE0000115	Ballintra SAC	<p><a href="#">Conservation Objectives</a> (09/2006)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Limestone Pavements</li> <li>• European Dry Heaths</li> </ul>
IE0002164	Lough Golagh and Breesy Hill SAC	<p><a href="#">Conservation Objectives</a> (29/09/2017)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Blanket bogs (if active)</li> </ul>
IE0001992	Tamur Bog Sac	<p><a href="#">Conservation Objectives</a> (05/2017)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• European dry heaths</li> <li>• Alpine and Boreal heaths</li> <li>• Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)</li> <li>• Blanket bogs (*if active bog)</li> <li>• Transition mires and quaking bogs</li> <li>• Depressions on peat substrates of the Rhynchosporion</li> <li>• Alkaline fens</li> <li>• Siliceous screes of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</li> <li>• Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)</li> <li>• Calcareous rocky slopes with chasmophytic vegetation</li> <li>• Siliceous rocky slopes with chasmophytic vegetation</li> </ul>
IE0001125	Dunragh Loughs/Pettigo Plateau SAC	<p><a href="#">Conservation Objectives</a> (16/05/2017)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>• Blanket bogs (if active bog)</li> </ul>
IE000112	River Finn SAC	<p><a href="#">Conservation Objectives</a> (31/05/2017)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Salmon <i>Salmo salar</i></li> <li>• Otter <i>Lutra lutra</i></li> <li>• Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)</li> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>• Blanket bogs (* if active bog)</li> <li>• Transition mires and quaking bogs</li> </ul>
IE0000133	Donegal Bay (Murvagh) SAC	<p><a href="#">Conservation Objectives</a> (09/07/2012)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Mudflats and sandflats not covered by seawater at low tide</li> <li>• Harbour Seal <i>Phoca vitulina</i></li> <li>• Fixed coastal dunes with herbaceous vegetation ('grey dunes')</li> <li>• Humid dune slack</li> </ul>
IE0000163	Lough Eske and Ardnamona Wood SAC	<p><a href="#">Conservation Objectives</a> (21/03/2018)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		species for which the SAC has been selected: <ul style="list-style-type: none"> <li>• Freshwater Pearl Mussel <i>Margaritifera margaritifera</i></li> <li>• Salmon <i>Salmo salar</i></li> <li>• Killarney Fern <i>Trichomanes speciosum</i></li> </ul>
IE0000165	Lough Nillan (Carrickatlieve) SAC	<a href="#">Conservation Objectives</a> (06/09/2016) To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: <ul style="list-style-type: none"> <li>• Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)</li> <li>• Blanket bogs (if active bog)</li> </ul>
SAC 002287 SPA 004075	Lough Swilly SPA	<a href="#">Conservation Objectives</a> (19/07/2011) To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC and SPA has been selected: <ul style="list-style-type: none"> <li>• Estuaries</li> <li>• Coastal lagoons</li> <li>• Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</li> <li>• Otter <i>Lutra lutra</i></li> <li>• Old sessile oak woods with Ilex and Blechnum in the British Isles</li> <li>• Great Crested Grebe <i>Podiceps cristatus</i> wintering</li> <li>• Grey Heron <i>Ardea cinerea</i> wintering</li> <li>• Whooper Swan <i>Cygnus cygnus</i> wintering</li> <li>• Greylag Goose <i>Anser anser</i> wintering</li> <li>• Shelduck <i>Tadorna tadorna</i> wintering</li> <li>• Wigeon <i>Anas penelope</i> wintering</li> <li>• Teal <i>Anas crecca</i> wintering</li> <li>• Mallard <i>Anas platyrhynchos</i> wintering</li> <li>• Shoveler <i>Anas clypeata</i> wintering</li> <li>• Scaup <i>Aythya marila</i> wintering</li> <li>• Goldeneye <i>Bucephala clangula</i> wintering</li> <li>• Red-breasted Merganser <i>Mergus serrator</i> wintering</li> <li>• Coot <i>Fulica atra</i> wintering A130 Oystercatcher <i>Haematopus ostralegus</i> wintering</li> <li>• Knot <i>Calidris canutus</i> wintering</li> <li>• Dunlin <i>Calidris alpina</i> wintering</li> <li>• Curlew <i>Numenius arquata</i> wintering</li> <li>• Redshank <i>Tringa totanus</i> wintering</li> <li>• Greenshank <i>Tringa nebularia</i> wintering</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Black-headed Gull <i>Chroicocephalus ridibundus</i> breeding</li> <li>• Common Gull <i>Larus canus</i> wintering</li> <li>• Sandwich Tern <i>Sterna sandvicensis</i> breeding</li> <li>• Common Tern <i>Sterna hirundo</i> breeding</li> <li>• Greenland White-fronted goose <i>Anser albifrons flavirostris</i> wintering</li> </ul> Wetlands & Waterbirds
IE0002012	North Inishowen Coast SAC	<p><a href="#">Conservation Objectives</a> (24/11/2014)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Narrow-mouthed Whorl Snail <i>Vertigo angustior</i></li> <li>• Mudflats and sandflats not covered by seawater at low tide</li> <li>• Perennial vegetation of stony banks</li> <li>• Vegetated sea cliffs of the Atlantic and Baltic coasts</li> <li>• Otter <i>Lutra lutra</i></li> <li>• Fixed coastal dunes with herbaceous vegetation (grey dunes)</li> <li>• Machairs ( in Ireland)</li> <li>• European dry heaths</li> </ul>
IE0000168	Magheradrumman Bog SAC	<p><a href="#">Conservation Objectives</a> (24/11/2014)</p> <p>To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected:</p> <ul style="list-style-type: none"> <li>• Northern Atlantic wet heaths with <i>Erica tetralix</i></li> <li>• Blanket bogs (if active)</li> </ul>
UK9020271	Outer Ards SPA	<p><a href="#">Conservation Objectives Specific Version 4.0</a> (01/04/2015)</p> <p>To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <p>Special Conservation Interests</p> <ul style="list-style-type: none"> <li>• Arctic Tern (<i>Sterna paradisaea</i>)</li> <li>• Golden Plover (<i>Pluvialis apricaria</i>)</li> <li>• Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</li> <li>• Ringed Plover (<i>Charadrius hiaticula</i>)</li> <li>• Turnstone (<i>Arenaria interpres</i>)</li> <li>• Habitat Extent</li> </ul>
UK9020031	Lough Foyle SPA	<p><a href="#">Conservation Objectives Specific Version 4.0</a> (01/04/2015)</p> <p>To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <p>Special Conservation Interests</p> <ul style="list-style-type: none"> <li>• Bewick's Swan (<i>Cygnus columbianus bewickii</i>)</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Whooper Swan (<i>Cygnus cygnus</i>)</li> <li>• Golden Plover (<i>Pluvialis apricaria</i>)</li> <li>• Bar-tailed Godwit (<i>Limosa lapponica</i>)</li> <li>• Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</li> <li>• Great Crested Grebe (<i>Podiceps cristatus</i>)</li> <li>• Cormorant (<i>Phalacrocorax carbo</i>)</li> <li>• Greylag Goose (<i>Anser anser</i>)</li> <li>• Shelduck (<i>Tadorna tadorna</i>)</li> <li>• Wigeon (<i>Anas penelope</i>)</li> <li>• Teal (<i>Anas crecca</i>)</li> <li>• Mallard (<i>Anas platyrhynchos</i>)</li> <li>• Eider (<i>Somateria mollissima</i>)</li> <li>• Red-breasted Merganser (<i>Mergus serrator</i>)</li> <li>• Oystercatcher (<i>Haematopus ostralegus</i>)</li> <li>• Lapwing (<i>Vanellus vanellus</i>)</li> <li>• Knot (<i>Calidris canutus</i>)</li> <li>• Dunlin (<i>Calidris alpina alpina</i>)</li> <li>• Curlew (<i>Numenius arquata</i>)</li> <li>• Redshank (<i>Tringa totanus</i>)</li> <li>• Waterfowl Assemblage wintering population</li> <li>• Habitat Extent</li> <li>• Roost sites wintering population</li> </ul>
UK9020091	Lough Neagh & Lough Beg SPA	<p><a href="#">Conservation Objectives Specific Version 4.0</a> (01/04/2015)</p> <p>To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Common Tern (<i>Sterna hirundo</i>)</li> <li>• Great Crested Grebe (<i>Podiceps cristatus</i>)</li> <li>• Whooper Swan (<i>Cygnus cygnus</i>)</li> <li>• Bewick's Swan (<i>Cygnus columbianus bewickii</i>)</li> <li>• Golden Plover (<i>Pluvialis apricaria</i>)</li> <li>• Pochard (<i>Aythya ferina</i>)</li> <li>• Tufted Duck (<i>Aythya fuligula</i>)</li> <li>• Scaup (<i>Aythya marila</i>)</li> <li>• Goldeneye (<i>Buaephala alangula</i>)</li> <li>• Little Grebe (<i>Tachybaptus ruficollis</i>)</li> <li>• Comorant (<i>Phalacrocorax carbo</i>)</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Greylag Goose (<i>Anser anser</i>)</li> <li>• Shelduck (<i>Tadorna tadorna</i>)</li> <li>• Wigeon (<i>Anas penelope</i>)</li> <li>• Gadwall (<i>Anas strepera</i>)</li> <li>• Teal (<i>Anas creaca</i>)</li> <li>• Mallard (<i>Anas platyrhynchos</i>)</li> <li>• Shoveler (<i>Anas clypeata</i>)</li> <li>• Coot (<i>Fulica atra</i>)</li> <li>• Lapwing (<i>Vanellus vanellus</i>)</li> <li>• Wintering waterfowl assemblage</li> <li>• Habitat Extent</li> </ul>
UK9020221	Larne Lough SPA	<p><a href="#">Conservation Objectives Specific Version 4.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</li> <li>• Common Tern (<i>Sterna hirundo</i>)</li> <li>• Roseate Tern (<i>Sterna dougallii</i>)</li> <li>• Sandwich Tern (<i>Thalasseus sandvicensis</i>)</li> <li>• Habitat Extent</li> </ul>
UK9020101	Belfast Lough SPA	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Redshank (<i>Tringa totanus</i>)</li> <li>• Great Crested Grebe (<i>Podiceps cristatus</i>)</li> <li>• Habitat Extent</li> </ul>
UK9020290	Belfast Lough Open Water SPA	<p><a href="#">Conservation Objectives Specific Version 2.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Great Crested Grebe (<i>Podiceps cristatus</i>)</li> <li>• Habitat Extent</li> </ul>
UK9020011	Rathlin Island SPA	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Peregrine Falcon (<i>Falco peregrinus</i>)</li> <li>• Guillemot (<i>Uria aalge</i>)</li> <li>• Razorbill (<i>Alca torda</i>)</li> <li>• Kittiwake (<i>Rissa tridactyla</i>)</li> <li>• Seabird Assemblage breeding population</li> <li>• Habitat Extent</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK9020021	Sheep Island SPA	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Comorant (<i>Phalacrocorax carbo</i>)</li> <li>• Habitat Extent</li> </ul>
IE0004075	Lough Swilly SPA	<p><a href="#">Conservation Objectives Specific Version 1.0</a> (19/07/2011) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]</li> <li>• Grey Heron (<i>Ardea cinerea</i>) [A028]</li> <li>• Whooper Swan (<i>Cygnus cygnus</i>) [A038]</li> <li>• Greylag Goose (<i>Anser anser</i>) [A043]</li> <li>• Shelduck (<i>Tadorna tadorna</i>) [A048]</li> <li>• Wigeon (<i>Anas penelope</i>) [A050]</li> <li>• Teal (<i>Anas crecca</i>) [A052]</li> <li>• Mallard (<i>Anas platyrhynchos</i>) [A053]</li> <li>• Shoveler (<i>Anas clypeata</i>) [A056]</li> <li>• Scaup (<i>Aythya marila</i>) [A062]</li> <li>• Goldeneye (<i>Bucephala clangula</i>) [A067]</li> <li>• Red-breasted Merganser (<i>Mergus serrator</i>) [A069]</li> <li>• Coot (<i>Fulica atra</i>) [A125]</li> <li>• Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</li> <li>• Knot (<i>Calidris canutus</i>) [A143]</li> <li>• Dunlin (<i>Calidris alpina</i>) [A149]</li> <li>• Curlew (<i>Numenius arquata</i>) [A160]</li> <li>• Redshank (<i>Tringa totanus</i>) [A162]</li> <li>• Greenshank (<i>Tringa nebularia</i>) [A164]</li> <li>• Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>• Common Gull (<i>Larus canus</i>) [A182]</li> <li>• Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]</li> <li>• Common Tern (<i>Sterna hirundo</i>) [A193]</li> <li>• Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]</li> <li>• Wetland and Waterbirds [A999]</li> </ul>
UK9020111	Strangford Lough SPA	<p><a href="#">Conservation Objectives Specific Version 4.0</a> (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</li> <li>• Knot (<i>Calidris canutus</i>)</li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Common Tern (<i>Sterna hirundo</i>)</li> <li>• Arctic Tern (<i>Sterna paradisaea</i>)</li> <li>• Sandwich Tern (<i>Sterna sandvicensis</i>)</li> <li>• Redshank (<i>Tringa totanus</i>)</li> <li>• Waterfowl assemblage</li> <li>• Habitat Extent</li> </ul>
UK9020051	Pettigoe Plateau SPA	<p><a href="#">Conservation Objectives Specific Version 3.0</a> (01/04/2015)</p> <p>To maintain each feature in favourable condition, as defined by a series of attributes and targets.</p> <ul style="list-style-type: none"> <li>• Golden Plover (<i>Pluvialis apricaria</i>)</li> </ul>
UK9020320	East Coast (NI) Marine SPA	<p>To maintain each feature in favourable condition.</p> <ul style="list-style-type: none"> <li>• Great Crested Grebe wintering population</li> <li>• Red-throated Diver</li> <li>• Sandwich Tern</li> <li>• Common Tern</li> <li>• Arctic Tern</li> <li>• Manx Shearwater</li> <li>• Eider Duck</li> </ul>
004167	Slevebeagh SPA	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> <li>• Hen Harrier <i>Circus cyaneus</i></li> </ul>
004087	Lough Foyle SPA	<p><a href="#">Conservation Objectives</a> (23/09/2014)</p> <p>To maintain or restore the favourable conservation condition of the habiotiats and species listed:</p> <ul style="list-style-type: none"> <li>• Red-throated Diver <i>Gavia stellata</i></li> <li>• Great Crested Grebe <i>Podiceps cristatus</i></li> <li>• Bewick's Swan <i>Cygnus columbianus bewickii</i></li> <li>• Whooper Swan <i>Cygnus cygnus</i></li> <li>• Greylag Goose <i>Anser anser</i></li> <li>• Brent Goose <i>Branta bernicla hrota</i></li> <li>• Shelduck <i>Tadorna tadorna</i></li> <li>• Wigeon <i>Anas penelope</i></li> <li>• Teal <i>Anas crecca</i></li> <li>• Mallard <i>Anas platyrhynchos</i></li> <li>• Eider <i>Somateria mollissima</i></li> <li>• Red-breasted Merganser <i>Mergus serrator</i></li> </ul>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Oystercatcher <i>Haematopus ostralegus</i></li> <li>• Golden Plover <i>Pluvialis apricaria</i></li> <li>• Lapwing <i>Vanellus vanellus</i></li> <li>• Knot <i>Calidris canutus</i></li> <li>• Dunlin <i>Calidris alpina alpina</i></li> <li>• Bar-tailed Godwit <i>Limosa lapponica</i></li> <li>• Curlew <i>Numenius arquata</i></li> <li>• Redshank <i>Tringa tetanus</i></li> <li>• Black-headed Gull <i>Chroicocephalus ridibundus</i></li> <li>• Common Gull <i>Larus canus</i></li> <li>• Herring Gull <i>Larus argentatus</i></li> <li>• Wetlands</li> </ul>
004194	Horn Head to Fanad Head SPA	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> <li>• Fulmar <i>Fulmarus glacialis</i></li> <li>• Cormorant <i>Phalacrocorax carbo</i></li> <li>• Shag <i>Phalacrocorax aristotelis</i></li> <li>• Barnacle Goose <i>Branta leucopsis</i></li> <li>• Peregrine <i>Falco peregrinus</i></li> <li>• Kittiwake <i>Rissa tridactyla</i></li> <li>• Guillemot <i>Uria aalge</i></li> <li>• Razorbill <i>Alca torda</i></li> </ul>
004057	Lough Derg (Donegal) SPA	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> <li>• Lesser Black-backed Gull (<i>Larus fuscus</i>)</li> <li>• Herring Gull (<i>Larus argentatus</i>)</li> </ul>
004099	Pettigo Plateau Nature Reserve SPA	<p><a href="#">Conservation Objectives</a> (21/02/2018)</p> <p>To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> <li>• Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>)</li> </ul>
004151	Donegal Bay SPA	<p><a href="#">Conservation Objectives</a> (17/05/2012)</p> <p>To maintain or restore the favourable conservation condition of the bird species and habitats listed as Special Conservation Interests for this SPA:</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		<ul style="list-style-type: none"> <li>• Great Northern Diver <i>Gavia immer</i> wintering</li> <li>• Light-bellied Brent Goose <i>Branta bernicla hrota</i> wintering</li> <li>• Common Scoter <i>Melanitta nigra</i> wintering</li> <li>• Sanderling <i>Calidris alba</i> wintering</li> <li>• Wetlands</li> </ul>
004187	Sligo/Leitrim Uplands SPA	<p><a href="#">Conservation Objectives</a> (21/02/2012)</p> <p>To maintain or restore the favourable conservation condition of the bird species and habitats listed as Special Conservation Interests for this SPA:</p> <ul style="list-style-type: none"> <li>• Peregrine <i>Falco peregrinus</i></li> <li>• Chough <i>Pyrrhocorax pyrrhocorax</i></li> </ul>
UK12016	Lough Neagh & Lough Beg Ramsar site	<p>Qualifies under the following criteria of the Ramsar Convention:</p> <p>Criterion 1 – by being the largest freshwater lake in the United Kingdom</p> <p>Criterion 2 – supports over 40 rare or local vascular plants which have been recorded for the site since 1970.</p> <p>Criterion 3 – regularly supports substantial numbers of individuals from particular groups of waterfowl which are indicative of wetland values, productivity and diversity.</p> <p>Criterion 4 – supporting an important assemblage of breeding birds including nationally and internationally important numbers of pochard, tufted duck, goldeneye, little grebe, great crested grebe, cormorant, mute swan, greylag goose, shelduck, wigeon, gadwall, teal, mallard, shoveler, scaup, and coot.</p> <p>Criterion 5 – supporting over 20,000 waterfowl in winter.</p> <p>Criterion 6 – regularly supports internationally important numbers of wintering Bewick's and whooper swans and under Article 4.1 by regularly supporting nationally important numbers of breeding common tern.</p> <p>Criterion 7 –supporting a population of Pollan, one of the few locations in Ireland.</p>
UK12002	Belfast Lough Ramsar	<p><a href="#">Belfast Lough</a> site qualifies under Criterion 3c by regularly supporting internationally important numbers of redshank in winter. The site also regularly supports nationally important numbers of shelduck, oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, curlew and turnstone. Belfast Lough as a whole is also used by several other waterfowl species including great crested grebe, scaup, eider, goldeneye and red-breasted merganser.</p>
UK12013	Larne Lough Ramsar	<p><a href="#">Larne Lough</a> site qualifies under Criterion 3c of the Ramsar Convention by regularly supporting internationally important numbers of Light-bellied Brent geese in winter. The site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species.</p>
UK12014	Lough Foyle Ramsar	<p><a href="#">Lough Foyle</a> The site qualifies under Criterion 1a of the Ramsar Convention by being a particularly good representative example of a wetland complex including intertidal sand and mudflats with extensive seagrass beds, saltmarsh, estuaries and associated brackish ditches.</p> <p>The site also qualifies under Criterion 1c by being a particularly good representative example of a wetland, which plays a substantial hydrological, biological and ecological system role in the natural functioning of a major river basin which is located in a trans-border position.</p>

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK12021	Strangford Lough Ramsar	<a href="#">Strangford Lough</a> site further qualifies under Criterion 1 by virtue of supporting a variety of important wetland features. Areas of fringing saltmarsh and freshwater habitats support a diversity of wetland plant species. Strangford Lough supports one of the most extensive saltmarsh areas in Northern Ireland. The diversity of the marine habitats is internationally renowned. This site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered wetland plants and animal species. These include a number of marine sponges, marine hydroids, marine mollusc and sea urchins which are either restricted to Strangford Lough in Northern Ireland or, in some cases unknown or very rare elsewhere in the British Isles. The site also qualifies under Criterion 3a by regularly supporting in winter over 20,000 waterfowl. Nationally important species contribute to this overall population of over-wintering waterfowl - bar-tailed godwit, black-tailed godwit, coot, curlew, dunlin, eider, gadwall, great-crested grebe, greylag goose, greenshank, goldeneye, golden plover, lapwing, mallard, mute swan, oystercatcher, pintail, red-breasted merganser, ringed plover, shelduck, shoveler, teal, turnstone and wigeon. It qualifies under Criterion 3c by regularly supporting, in winter, internationally important numbers of Light-bellied Brent Geese, Knot and Redshank. The final qualification under Criterion 3c is that the site regularly supports internationally important breeding populations of both Sandwich Tern and Common Tern along with nationally important numbers of Arctic Tern.
UK12018	Outer Ards Ramsar	<a href="#">Outer Ards</a> site is a Wetland of International Importance because it qualifies under Criterion 6 for regularly supporting 1% of the individuals in a population of one species or subspecies of waterbird in any season
UK12019	Pettigoe Plateau Ramsar	<a href="#">Pettigoe Plateau</a> qualifies under Criterion 1a of the Ramsar Convention by being a particularly good representative example of blanket bog. The extensive blanket bog which covers most of the site exhibits the full range of characteristic vegetation and structural features associated with this type of habitat. These features include a large number of well-developed pool complexes, frequent acid flushes, basin mires and ladder fens. This site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species and regularly supports nationally important numbers of breeding golden plovers. The site is also used by breeding hen harrier and merlin. In addition, Pettigoe is notable for Greenland white-fronted goose and it forms part of an extended cross-border site which occasionally supports nationally important numbers of this species.
UK12003	Black Bog Ramsar	<a href="#">Black Bog</a> site qualifies under criterion 1a of the Ramsar Convention by being a particularly good representative example of lowland raised bog. In western Europe most of the relatively intact raised bogs occur in the UK and Ireland.
UK12008	Fairy Water Bogs Ramsar	<a href="#">Fairy Water Bog</a> The site qualifies under criterion 1a of the Ramsar Convention by being a particularly good representative example of lowland raised bog. In western Europe most of the relatively intact raised bogs occur in the UK and Ireland. Three examples of bogs – Bomackatall, Claragh and Kilmore Robinson - are included in this composite site.

**Table 4.2: Potential Projects and Pathways of Effect to European sites**

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
<b>Asset Replacement Projects</b>			
Donegall Main (North) Transformer Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Coolkeeragh - Magherafelt 275 kV Circuits Restrung	Yes. Project intersects with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project intersects with European sites.
Ballylumford Switchgear Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Castlereagh Inter-bus Transformer 1 Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Hannahstown Inter-bus transformer 1 and 2 replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Tandragee Inter-bus Transformer 1 and 2 replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Kells Inter-bus Transformer 1 and 2 Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Ballylumford Inter-bus transformer 1 and 2 Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Ballymena Main Transformer 3 and 4 Replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Enniskillen Main transformer 1 and 2 replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Banbridge Main transformer 1, 2, 3 and 4 replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Glengormley Main Tx B	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Shunt Reactors	No. Project is contained within confines	No. Project is contained within confines	No, Project not in proximity to

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
	of existing substation footprint.	of existing substation footprint with no pathway to downstream European sites.	European sites.
Strabane Main 110kV refurbishment	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Limavady Main 110kV refurbishment	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
<b>Renewable Generation Cluster Substations and New Connections</b>			
Curraghmulkin 110/33kV Cluster (formerly Drumquin)	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites, but not considered further in Plan level HRA as project has been consented and progressed to construction.	No, Project not in proximity to European sites.
Agivey 110/33 kV Cluster	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Kells Wind 110/33 kV Cluster	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Fair Head / Torr Head Tidal Scheme connection (approval pending)	Yes. Project may intersect with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project in proximity to European sites.
Belfast Power Station	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project in proximity to European sites.
Compressed Air Energy Storage Scheme connection (on hold)	Yes, project located in European sites	Yes, project located in European sites	Yes, project located in European sites
<b>Renewable Integration Developments</b>			
Omagh Main – Omagh South Uprate	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Omagh Reactive Compensation	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Tamnamore Reactive Compensation	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Coleraine Reactive Compensation	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Kells/Creagh -Rasharkin New 110kV Circuit	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Tamnamore – Turleenan Uprate	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
Coolkeeragh – Trillick new 110 kV line (on hold)	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Turleenan- Omagh South – Co. Donegal new 275 kV line (on hold)	Yes. Potential to intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Potentially proximate to European sites.
North West of Northern Ireland Reinforcement	Yes. Potential to intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Potentially proximate to European sites.
<b>Load Related and Security of Supply</b>			
Sydenham Road Main (new station)	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project in proximity to European sites.
Ballylumford-Castlereagh 110 kV Circuit restring	Yes. Potential to intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Potentially proximate to European sites.
Drumnakelly and Armagh Development Plan	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Castlereagh 275 kV new no. 4 inter-bus transformer (Capital approval pending)	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Coolkeeragh T1 Transformer cabling uprate	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Tandragee 110 kV 275 kV second busbar coupler	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Kells Remote Control	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
North West Special Protection Scheme upgrade	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Enhancement to the low frequency load disconnection scheme	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Augmentation of capacity at Transmission / Distribution interface	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
<b>Fault Level Replacements</b>			
Castlereagh and Tandragee 110 kV Switchgear replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
Castlereagh – Knock 110kV cables uprate	No. Project does not intersect with	Yes. Project in catchment of	No, Project not in proximity to

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
	European sites.	downstream European sites.	European sites.
Cregagh Transformer B switchgear replacement	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to downstream European sites.	No, Project not in proximity to European sites.
<b>Interconnection</b>			
North-South Interconnector	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites, but not considered further in Plan level HRA as project has been consented.	No, Project not in proximity to European sites.

**Table 4.3: European sites that could have LSEs as a result of the implementation of the potential Projects**

Project	European sites that could experience a likely significant effect		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
<b>Asset Replacement Projects</b>			
Coolkeeragh - Magherafelt 275 kV Circuits Restrung	Banagher Glen SAC River Roe & Tributaries SAC River Faughan & Tributaries SAC	River Roe & Tributaries SAC River Faughan & Tributaries SAC Lough Foyle SPA Lough Foyle Ramsar Site Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	Banagher Glen SAC Lough Foyle SPA Lough Foyle Ramsar Site
<b>Renewable Generation Cluster Substations and New Connections</b>			
Agivey 110/33 kV Cluster		River Roe & Tributaries SAC Bann Estuary SAC Lough Foyle SPA Lough Foyle Ramsar Site	
Kells Wind 110/33 kV Cluster		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Fair Head / Torr Head Tidal Scheme connection (approval pending)	Garron Plateau SAC Breen Wood SAC Antrim Hills SPA	Red Bay SAC Larne Lough SPA Lough Neagh & Lough Beg SPA Lough Neagh and Lough Beg Ramsar Site Larne Lough Ramsar Site East Coast (NI) Marine SPA	Antrim Hills SPA East Coast (NI) Marine SPA
Belfast Power Station		Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Belfast Lough Ramsar Site	Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Belfast Lough Ramsar Site
Compressed Air Energy Storage Scheme connection (on hold)	Larne Lough SPA Larne Lough Ramsar Site East Coast (NI) Marine SPA North Channel SAC	The Maidens SAC Larne Lough SPA Larne Lough Ramsar Site East Coast (NI) Marine SPA North Channel SAC	The Maidens SAC Larne Lough SPA Larne Lough Ramsar Site East Coast (NI) Marine SPA North Channel SAC
<b>Renewable Integration Developments</b>			
Omagh Main – Omagh South Uprate		River Foyle and Tributaries SAC Lough Foyle SPA Lough Foyle Ramsar Site	
Omagh Reactive Compensation		River Foyle and Tributaries SAC Lough Foyle SPA	

Project	European sites that could experience a likely significant effect		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
		Lough Foyle Ramsar Site	
Tamnamore Reactive Compensation		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Coleraine Reactive Compensation		Bann Estuary SAC	
Kells/Creagh -Rasharkin New 110kV Circuit		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Tamnamore – Turleenan Uprate		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Coolkeeragh – Trillick new 110 kV line (on hold)		Lough Swilly SAC Lough Swilly SPA Lough Foyle SPA Lough Foyle Ramsar Site	
Turleenan- Omagh South – Co. Donegal new 275 kV line (on hold)	Largalunny SAC Black Bog SAC Pettigoe Plateau SAC Deroran Bog SAC Fairy Water Bogs SAC Tully Bogs SAC Cranny Bogs SAC Tonnagh Beg Bog SAC Monawilkin SAC Lough Melvin SAC Pettigoe Plateau SPA Pettigoe Plateau Ramsar Site Black Bog Ramsar Site Fairy Water Bogs Ramsar Site	Black Bog SAC Pettigoe Plateau SAC Deroran Bog SAC Fairy Water Bogs SAC Tully Bogs SAC Cranny Bogs SAC Tonnagh Beg Bog SAC Lough Melvin SAC Pettigoe Plateau SPA Pettigoe Plateau Ramsar Site Black Bog Ramsar Site Fairy Water Bogs Ramsar Site	Pettigoe Plateau SPA Pettigoe Plateau Ramsar Site Black Bog Ramsar Site Fairy Water Bogs Ramsar Site
North West of Northern Ireland Reinforcement	River Faughan & Tributaries SAC North Channel SAC Lough Foyle SPA Lough Foyle Ramsar Site Magilligan SAC Bann Estuary SAC Skerries & Causeway SAC North Antrim Coast SAC Rathlin Island SAC Red Bay SAC The Maidens SAC Rathlin Island SPA East Coast (NI) Marine SPA	River Faughan & Tributaries SAC North Channel SAC Lough Foyle SPA Lough Foyle Ramsar Site Bann Estuary SAC Skerries & Causeway SAC Rathlin Island SAC Red Bay SAC The Maidens SAC Rathlin Island SPA East Coast (NI) Marine SPA Outer Ards SPA Sheep Island SPA	River Faughan & Tributaries SAC North Channel SAC Lough Foyle SPA Lough Foyle Ramsar Site Bann Estuary SAC Skerries & Causeway SAC The Maidens SAC Rathlin Island SPA East Coast (NI) Marine SPA Outer Ards SPA Sheep Island SPA River Foyle & Tributaries SAC Owenkillew River SAC

Project	European sites that could experience a likely significant effect		
	<i>Habitat Loss</i>	<i>Water quality and habitat deterioration</i>	<i>Disturbance and Displacement</i>
	Outer Ards SPA Sheep Island SPA River Foyle & Tributaries SAC Tully Bog SAC Owenkillev River SAC Teal Lough SAC Curran Bog SAC Ballynahone Bog SAC Carn-Glenshane Pass SAC Banagher Glen SAC Ballynahone Bog Ramsar Site Lough Neagh & Lough Beg SPA Lough Neagh & Lough Beg Ramsar Site Outer Ards Ramsar Site	River Foyle & Tributaries SAC Tully Bog SAC Owenkillev River SAC Teal Lough SAC Curran Bog SAC Ballynahone Bog SAC Carn-Glenshane Pass SAC Ballynahone Bog Ramsar Site Lough Neagh & Lough Beg SPA Lough Neagh & Lough Beg Ramsar Site Outer Ards Ramsar Site	Banagher Glen SAC Ballynahone Bog Ramsar Site Lough Neagh & Lough Beg SPA Lough Neagh & Lough Beg Ramsar Site Outer Ards Ramsar Site
<b>Load Related and Security of Supply</b>			
Sydenham Road Main (new station)		Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Belfast Lough Ramsar Site	Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Belfast Lough Ramsar Site
Ballylumford-Castlereagh 110 kV Circuit restring	Larne Lough SPA	Strangford Lough SAC North Channel SAC Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Larne Lough SPA Strangford Lough SPA Belfast Lough Ramsar Site Larne Lough Ramsar Site Strangford Lough Ramsar site	Larne Lough SPA
Drumnakelly and Armagh Development Plan		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
<b>Fault Level Replacements</b>			
Castlereagh – Knock 110kV cables uprate		Belfast Lough SPA Belfast Lough Open Water SPA East Coast (NI) Marine SPA Belfast Lough Ramsar Site Strangford Lough SAC Strangford Lough SPA Strangford Lough Ramsar Site	

### 4.3 SUMMARY OF SCREENING STAGE

The Screening exercise was completed in compliance with the relevant European Commission and national guidelines to determine whether or not adopting the draft Transmission Development Plan Northern Ireland (TDPNI) 2018-2028 is likely to have a significant effect on any European site.

From the findings of the Screening exercise, the possibility of Likely Significant Effects upon European site considered cannot be discounted for a number of potential projects, in light of their Qualifying Interests and Conservation Objectives. This conclusion was reached without having to consider the draft TDPNI in combination with any other plans or projects.

As outlined in Table 3.1, forty four potential projects that could come forward under the TDPNI during the plan period were screened for appropriate assessment. These potential projects are outlined in Table 3.2. Of these, the possibility of likely significant effects could be discounted for twenty five potential projects. For nineteen potential projects that could come forward under the TDPNI during the plan period, likely significant effects could not be discounted as outlined in Table 4.3.

- The possibility of likely significant **Habitat Loss** effects cannot be discounted for forty five European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
- The possibility of likely significant **Water Quality and Habitat Deterioration** effects cannot be discounted for forty four European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
- The possibility of likely significant **Disturbance and Displacement** effects cannot be discounted for twenty nine European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Having regard to the methodology employed and the findings of the screening stage exercise, it is concluded that an appropriate assessment of the implications of the TDPNI on European sites is required, in view of their conservation objectives and in combination with any other relevant plans or projects.

## 5 APPROPRIATE ASSESSMENT

Appropriate Assessment is the process which identifies the impact of a plan or project, either alone or in combination with other projects or plans, on the integrity of a European site with respect to the conservation objectives of the site and to its structure and function; and considers whether it can be concluded that there will be no adverse effects on the integrity of the European site ([EC, 2001](#)). If the information provided suggests that adverse effects are likely then it is necessary to devise mitigation measures to avoid, where possible, adverse effects.

### 5.1 POSSIBLE ADVERSE EFFECTS

Based on the potential projects as described in Section 3.4, and the overview of transmission infrastructure and their construction methods presented in Section 3.5, potential adverse effects have been identified (where likely significant effects could not be discounted) on a range of European sites under three impact themes as set out in Table 4.3.

Possible direct and indirect effects are discussed under three themes:

- Habitat Loss
- Water quality and habitat deterioration
- Disturbance and Displacement

#### 5.1.1 Habitat Loss

The main potential impacts associated with the construction and operation/refurbishment of transmission infrastructure projects on habitats is habitat loss and damage. Construction is the period where most impacts occur. Besides this being the time when the heaviest loads will be in place around structures in the form of construction plant, it is also the time when temporary access and excavation works will be required and hence the time of greatest disturbance to the surrounding area.

##### 5.1.1.1 Direct habitat loss

Overhead line projects have overall a very small physical footprint in terms of actual habitat removal compared to other linear projects such as road construction. Habitat removal for overhead line construction is generally limited to the areas around the base of towers and pole sets and along access routes. It is considered that the laying of underground cables has the potential to have a greater impact on habitats, as the area of habitat removal and disturbance is greater in order to facilitate trenching. However, underground cables are generally laid in public roads and therefore tend to avoid high value habitats.

Construction of steel lattice towers results in the direct loss of habitat within the footprint of the tower foundations, and potentially also in the immediately adjoining works area. Installation of wooden pole sets results in a very small amount of habitat loss at each pole set location.

Overhead lines routed through forestry require a permanent wayleave corridor for maintenance and safety requirements, which results in long term habitat loss. There will also be a change of habitat from woodland to scrub underneath the powerlines at these locations.

During the construction of either underground cables or overhead lines, field boundaries may be altered or removed to accommodate access or trench digging. Depending on the habitat, permanent habitat clearance may be required along sections of the corridor for underground cable projects for technical reasons. This loss

may only be temporary depending on the habitat (trees and hedgerows cannot be reinstated over underground cables).

Habitat loss in a European site may occur in an area containing qualifying Annex I habitat types. This is likely to undermine the sites conservation objective to maintain the habitat area of the qualifying habitat type.

#### **5.1.1.2 Habitat damage and disturbance**

Movements of machinery and personnel during construction can cause compaction and damage to surface vegetation leading to the degradation of habitat quality. Placement of excavated material directly on the habitat surface can also lead to damage, including during temporary storage and also when the excavated deeper soil and surface vegetated material is lifted for replacement in excavations.

Wetland and peatland habitats depend on specific hydrological conditions and are particularly vulnerable to disturbance. For example, peat soils can be locally destabilised during pole and tower construction, laying of access track and conductor stringing.

The EirGrid evidence based habitats study ([Eirgrid, 2016](#)) showed that some habitats are much more sensitive to disturbance. The study found that damage to peatlands can have significant long-term impacts and that the habitat may not recover from damage.

#### **5.1.1.3 Spread of invasive species**

Invasive species can have a major negative impact on native biodiversity. When non-native species become invasive, they can transform ecosystems and threaten native and endangered species. The most prominent negative effect of invasive species, in terms of ecology, is competition with native biota and alteration of habitats.

Habitat removal, in particular for a road or utility corridor, can encourage the spread of invasive species by the creation of edge effects, and the direct introduction of non-native plant species by transfer of vector material on construction vehicles or equipment. In a study of non-native species along transport corridors, Hansen & Clevanger (2005) found that transport corridors can encourage the invasion of non-native species by removing barriers in several ways.

As underground cable projects tend to be located along the public road network, often in the roadside verge, the potential to spread invasive species which may be present is very high. This is especially true for species such as Japanese knotweed (*Fallopia japonica*) which is easily spread if disturbed.

The spread of invasive species within a European site may occur if transferred there at construction stage. This is likely to undermine the sites conservation objective to keep invasive or negative indicator species at a very low level.

### **5.1.2 Water Quality and Habitat Deterioration**

A number of potential impacts on water quality and aquatic species of downstream European sites may result from the construction and maintenance of transmission lines and their corridors. Linear construction projects such as transmission lines and underground cables often pose a more significant risk to the aquatic environment than construction operations limited to one site. A project may require a large number of watercourse crossings, through varied environments, topography, soil types, geology and habitats, each requiring differing water management techniques.

### 5.1.2.1 Sedimentation

Excavation works related to the installation of overhead line structures and underground cables, and the associated storage of excavated spoil material, can pose a significant risk for sediment release into surface water drainage channels, streams and rivers. Ground damage from construction vehicles and machinery can also cause rutting and increased erosion of soils. Access tracks used during construction may affect surface run-off patterns, creating alternative flow paths, promoting erosion and localised flooding. Hydrological connectivity between a construction site and an downstream European site is a key factor which affects the risk of erosion and subsequent delivery of sediment to a designated wetland site.

The clearance and harvesting of trees is required where a transmission line crosses an area of commercial (or non-commercial) forestry. A corridor within the plantation is felled to accommodate the transmission line and provide the required safety clearance for the overhead line. The main potential impacts of forestry clearance on a water catchment and water quality relate to increased sedimentation, nutrient enrichment and flow regime changes (Moorkens *et al.*, 2013).

Some of the key concerns with elevated levels of sediment include the impact on spawning fish, through issues including the sedimentation of spawning gravels, clogging of fish gills and reduction in dissolved oxygen (Acornley & Sear, 1999; Sear *et al.*, 2008; Collins *et al.*, 2011).

The freshwater pearl mussel (*Margaritifera margaritifera*) requires very high quality rivers with clean river beds and waters, with very low levels of nutrients. Direct ingestion of silt by adult mussels can lead to rapid death. However, if the mussels clam-up as a response to a siltation episode, and siltation is prolonged, they die from oxygen starvation over a period of several days (Moorkens *et al.*, 2007).

### 5.1.2.2 Hydrocarbons and cement

#### **Hydrocarbons**

Hydrocarbons are products made from crude oil such as machinery fuels and lubricants. Leaks of these contaminants into watercourses can have serious impacts on aquatic species, particularly fish. Oil spillage and leaks are a common source of hydrocarbon contamination of groundwater and surface water (Manoli and Samara, 1999). A pollution event can occur as a result of poorly maintained vehicles and machinery including portable generators and accidental spillage during re-fuelling of same.

When hydrocarbons are released into the environment as a result of accidental spillages, there may be some fractions that float on top of the water, forming a thin surface film. Other heavier fractions may sink through the water column and accumulate in the sediment at the bottom of the waterbody, which may affect bottom feeding fish and organisms

The release of hydrocarbons into the aquatic environment can result in chronic impacts upon water dependent species downstream in a European site. The potential impacts include disruption to neurosensors, abnormal behaviour and development issues as well as direct impacts upon fertility. Oil spills can reduce the capacity of a water body to exchange oxygen as well as result in oil coating the gills of aquatic species causing lesions on respiratory surfaces. This can result in significant respiratory difficulties for aquatic organisms. Benthic invertebrates can be adversely affected if fractions of hydrocarbons settle and accumulate in sediments. This can result in the mortality of populations and prevent future colonisation (Bhattacharyya *et al.*, 2003).

#### **Cement and Concrete**

Concrete and cement are used in tower foundations and culverts. During the installation of steel lattice tower foundations there is a requirement to have concrete brought to site. If unmanaged, cement and concrete can

cause serious pollution to both surface and groundwater due to the highly alkali and corrosive properties of fresh concrete (Setunge et al., 2009; EA, 2011). Concrete wash water is a particularly severe pollutant, as it typically has a high pH (11-12) coupled with extremely high suspended sediment content (Sealey et al., 2001; EA, 2011). There is no definite pH range within which fish will be unharmed; however, there is a gradual deterioration as pH values extend outside the typical range (EIFAC, 1969). Freshwater pearl mussel can be adversely affected by elevated pH levels, for examples in areas where liming is undertaken, as the increased availability of calcium means they grow at a much faster rate (Killeen et al., 1998), and suffer reduced reproduction periods, which is contrary to their life strategy (Comfort, 1957; Ross, 1988).

### ***Disturbance of riparian habitat and fisheries habitat***

Heavy machinery operation in river channels and on river banks can disturb fisheries habitat and also the habitat of protected aquatic species such as lamprey species, otter (*Lutra lutra*) and kingfisher (*Alcedo atthis*).

### ***Instream works for underground cable installation***

Existing road bridges over watercourses cannot always accommodate high voltage cables and in such cases it will be necessary to pass through or underneath the watercourse depending on the size and sensitivity of the stream, river or canal. Trenchless techniques although they avoid direct impact to the instream habitat, require substantial working areas either side of the watercourse and the use of heavy machinery (see below). Where watercourses do not contain important fishery habitat open cut trenching may be a better option.

Instream works should only take place between July and September, outside the salmon spawning period from October to June, unless otherwise agreed with Inland Fisheries Ireland. (IFI, 2016)

### ***Horizontal Directional Drilling (HDD)***

Crossing of larger watercourses where ducting cannot be accommodated over the bridge deck or within the road structure is generally carried out using a trenchless technique where the cable ducting passes below the river bed. The most common trenchless technique used for cable ducting is horizontal directional drilling (HDD).

Aspects of HDD which could give rise to potential impacts include the following:

- i. Site access and ground preparation at the HDD launch and reception pits (and along access routes) could act as sources of silt wash-out to watercourses depending on ground conditions, slope and weather.
- ii. (Handling of drill arisings: Spills of drill arisings from any aspect of the handling process could be washed off the site and into watercourses with potential adverse impacts on aquatic life.
- iii. Drilling fluid blow-out (also referred to as frac-out): If the drilling process encounters fractured rock there is a possibility that drilling fluid could be forced up through these fissures to the surface and into watercourses along with any associated drill arisings, with potentially adverse consequences for aquatic life. The most frequently used drilling fluid used for HDD is a slurry of bentonite clay which is very high in suspended solids. However, specialist drilling fluids exist for use in proximity to watercourses, which have a significantly lower risk to aquatic ecology.
- iv. Site reinstatement: Inadequately managed HDD site de-commissioning and re-instatement could lead to silt wash-out reaching watercourses.

### ***Open cut trenching***

Crossings of smaller ditches and drains may be carried out by open-cut trenching, facilitated by damming and over-pumping or fluming.

Aspects of open cut trenching which could give rise to potential impacts include the following:

- i. Site access and ground preparation: Heavy vehicle activity at and approaching crossing points could give rise to localised soil and bank damage; this would result in solids washing into watercourses during heavy rainfall.
- ii. In-stream habitat damage: Excavation of the cable trench and damming the watercourse will result in the potential removal and/or silting of coarse bed material (boulders, cobbles, and gravel) which are important habitat elements required both for fish and invertebrates in watercourses.
- iii. Watercourse damming: Damming of the watercourse may result in the release of solids to the watercourse depending on the materials being used and the sequencing and approach taken. Where unsuitable clay or soil are used to make the dam, the likelihood of solids escape will be higher.
- iv. De-watering of watercourse crossing excavation: De-watering of excavations at the crossing may give rise to increase in stream solids if returned to the stream without treatment. Any fish trapped between dams would be directly affected by de-watering.
- v. Over-pumping: Water discharged downstream from the pumping-over operation has the potential to cause erosion of the riverbed at the discharge point below the downstream dam giving rise to habitat damage to the stream bed and solids erosion.
- vi. Site reinstatement: Incorrect sequencing of substrate reinstatement could significantly alter localised bed material structure within a watercourse.

The introduction of elevated levels of suspended sediments or pollutants to rivers that are European sites, or watercourses that could reach downstream European sites designated for aquatic species may occur if no measures are put in place to manage this risk. This could undermine a sites conservation objective to maintain or enhance the extent and quality of suitable habitat for these species.

### **5.1.3 Disturbance and Displacement**

#### **5.1.3.1 Potential impacts on otters**

Many of the potential projects that could be brought forward cross watercourses upstream of European sites, and some directly cross European sites, designated for otter. Whilst otters are dependent on water quality to maintain their aquatic prey items within the river system, they also breed and take shelter in holts on riverbanks.

Where transmission infrastructure is planned with structures spanning rivers, or where cables are directionally drilled under rivers, there is a possibility that construction activities could damage or destroy an otter holt or disturb otters in a holt.

This could undermine a sites conservation objective to maintain the population or distribution of otters; or the extent and quality of suitable otter habitat.

#### **5.1.3.2 Potential impacts on birds**

The main potential impact on birds from transmission infrastructure is mortality caused by collision with overhead lines. This is the most widely cited and researched area related to birds and transmission infrastructure as it can result in significant effects on migratory bird populations where rare or protected species are at risk.

### ***Risk of Collision***

Collision with wires is the main potential threat of transmission lines to birds. In relation to morphology and behaviour, studies indicate that risk factors for collision include poor flight manoeuvrability, blind spots in the visual field or poor acuity, flying at night or in low light levels, flocking behaviour, and the amount of time spent flying at collision risk height with power lines.

EirGrid's Evidence Based Study on Birds ([EirGrid, 2016b](#)) found that while a significant issue for consideration, collisions with powerlines are considered to be relatively rare events. Most studies conclude that mortality from collisions is unlikely to affect bird populations. However, where rare or protected species occur, impacts could be significant. The results of the field based study undertaken as part of EirGrid's Evidence Based Study on Birds found that collision rates estimated for transmission power line sites in the Republic of Ireland broadly fall within the range reported in other studies.

### ***Risk of Electrocution***

Electrocution of birds occurs when they make simultaneous contact with the energised and grounded sections of a power line, or between two phase conductors. This may occur when a bird is landing or taking off and the wings bridge the gap between wires, when a bird, nesting material or prey bridges the gap between the wires and a grounded power pole or pylon, or (rarely) when a bird touches only one conductor (Prinsen et al., 2011a).

The risk of electrocution of birds is considered to be low on electricity transmission structures in Ireland because of the design of poles and pylons and the wide spacing and arrangement of conductors. New transmission lines to be constructed in the future will be at 110 kV, 220 kV, 275 kV and 400kV. Conductor spacing for 110 kV lines is 4.5m, which is almost double the wing span of the largest Irish bird species such as Mute Swan and White-tailed Eagle. In addition, the design of structures is such that contact between conducting wires and grounded components is not possible ([EirGrid, 2016b](#)).

Studies worldwide indicate that it is only on lower voltage distribution lines that conducting wires and/or earthed components are placed sufficiently closely for even larger birds to touch two wires simultaneously, and larger bird species are most at risk of electrocution because they are most likely to bridge the gap between conducting wires.

### ***Risk of Displacement or Loss of Habitat Quality in Breeding and Wintering Areas***

Some bird species may be displaced from suitable habitat by the proximity of electricity transmission lines, which can act as a partial barrier to movement. Indirect loss of breeding or wintering habitats for bird species of conservation concern in Ireland (Colhoun and Cummins, 2013) may occur if they do not use traditional feeding or roosting sites after installation of a new power line. There is also the possibility of loss of breeding habitat for ground-nesting waders and raptors requiring a large display area (EirGrid, 2016).

Construction of new transmission lines in Ireland may have some limited effects in reducing the density of breeding birds or limiting the use of areas close to power lines by foraging birds such as wintering geese. No studies have been found that suggest wide scale displacement effects that might affect any species at a population scale. Nevertheless it is recommended that consideration is given to potential impacts should transmission power lines be proposed in areas which are important for wintering geese, in particular Greenland White-fronted Geese (*Anser albifrons flavirostris*) which show high site fidelity in wintering areas (Wilson et al., 1991).

Bird species which inhabit open environments might show avoidance of tall structures such as overhead power lines (this could result from avoidance of pylons or poles and/ or the wires) because of perceived predation risk.

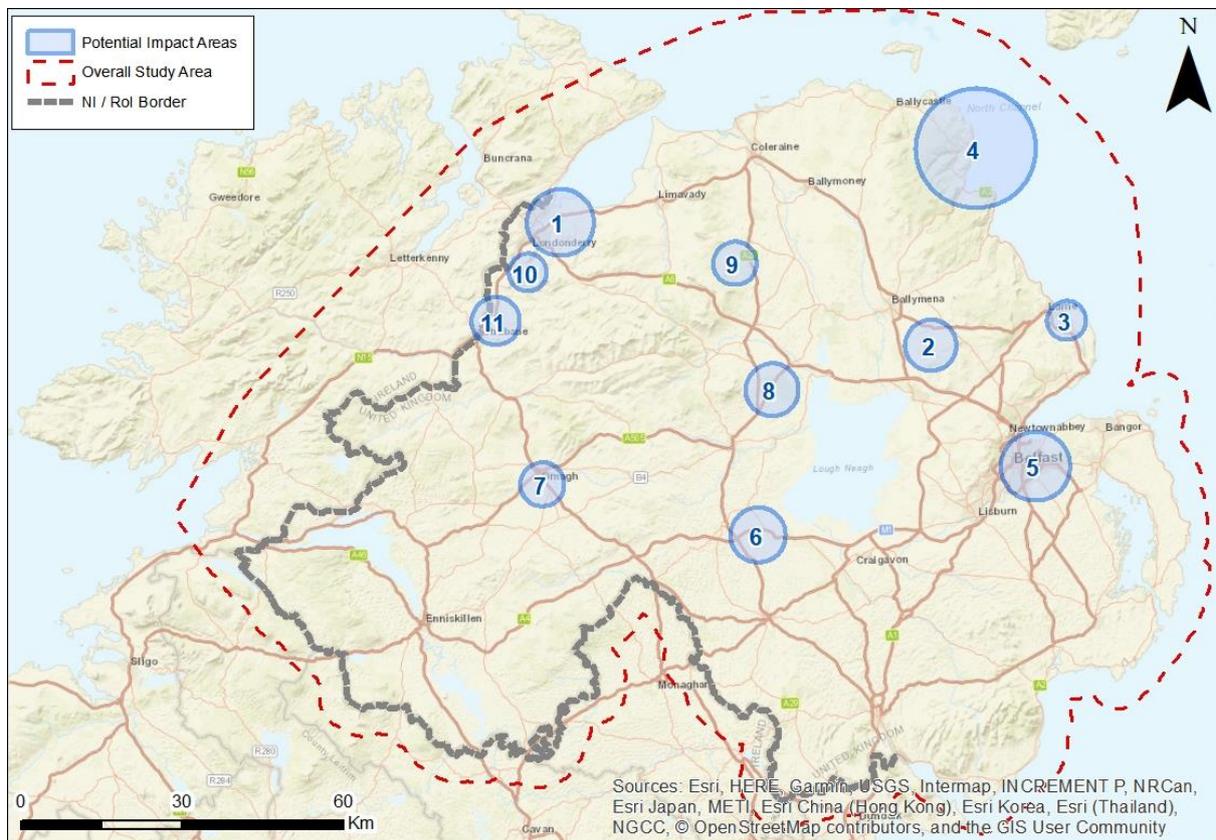
For example raptors and other predatory birds perch on tall objects to survey hunting areas (Pruett et al., 2009; Hagen and Giesen, 2005; Shroeber and Robb, 1993).

## 5.1.4 In-Combination Effects

### 5.1.4.1 TDPNI

Article 6(3) of the Habitats Directive requires that in-combination effects with other plans or projects are considered. Several of the projects within the TDPNI are mutually exclusive and therefore will not be developed if other projects go ahead, i.e. they serve the same purpose so both would not be required. Some independent projects may however be brought forward within the same geographical location and thus have more potential for in-combination effects. This section looks at the projects that may be developed within the Plan period, within the same vicinity, therefore giving the potential for in-combination effects.

Figure 5.1 illustrates the areas where independent projects may come together either in construction and / or in the long term, and where there is the greater potential for in-combination effects, which may need to be taken into consideration at a project assessment stage if applicable. The potential for in-combination effects in these areas are described below.



**Figure 5.1: Areas of potential in-combination effects between TDPNI Projects**

#### **Area 1 (Coolkeeragh)**

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Foyle European sites between the Coolkeeragh – Magherafelt 275kV Restrung and Coolkeeragh – Trillick 110kV New

Circuit projects if they were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

### ***Area 2 (Kells)***

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh and Lough Beg European sites between the Kells Wind Cluster New Substation, Fair/Torr Head Tidal 275 or 110kV New Circuit and/or the Kells/Creagh – Rasharkin 110kV New Circuit projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

### ***Area 3 (Larne)***

There is the potential for in-combination habitat loss effects to occur in Larne Lough SPA and Ramar site, East Coast (NI) Marine SPA or North Channel SAC between the Kilroot to Coolkeeragh HVDC Subsea New Circuit, CAES 275kV New Circuit or Ballylumford – Castlereagh 110kV Restraining projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.1 for a discussion on habitat loss effects.

There is potential for in-combination water quality and deterioration effects to occur in Larne Lough SPA and Ramar site, East Coast (NI) Marine SPA or North Channel SAC between the Kilroot to Coolkeeragh HVDC Subsea New Circuit, CAES 275kV New Circuit or Ballylumford – Castlereagh 110kV Restraining projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and deterioration effects.

There is potential for in-combination disturbance and displacement effects to occur in Larne Lough SPA and Ramar site, East Coast (NI) Marine SPA or North Channel SAC between the Kilroot to Coolkeeragh HVDC Subsea New Circuit, CAES 275kV New Circuit or Ballylumford – Castlereagh 110kV Restraining projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.3 for a discussion on disturbance and displacement effects.

### ***Area 4 (Torr Head Offshore)***

There is potential for in-combination water quality and deterioration effects to occur in East Coast (NI) Marine SPA, North Channel SAC or Rathlin Island European sites between the Fair/Torr Head Tidal 275 or 110kV New Circuit and Kilroot to Coolkeeragh HVDC Subsea New Circuit projects if they were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and deterioration effects.

### ***Area 5 (Belfast)***

There is potential for in-combination disturbance and displacement effects to occur in the Belfast Lough European sites between the Belfast Power Station, Sydenham Road Main New Substation, Ballylumford – Castlereagh 110kV Restraining and/or Castlereagh – Knock 110kV Uprate projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.3 for a discussion on disturbance and displacement effects.

There is potential for in-combination water quality and deterioration displacement effects to occur in the Belfast Lough European sites between the Belfast Power Station, Sydenham Road Main New Substation, Ballylumford – Castlereagh 110kV Restraining and/or Castlereagh – Knock 110kV Uprate projects if any of them were to be progressed and constructed at the same time. There is also potential for in-combination water quality and deterioration displacement effects to occur in the Strangford Lough European sites between the Ballylumford – Castlereagh 110kV Restraining and Castlereagh – Knock 110kV Uprate projects if they were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and deterioration effects.

**Area 6 (Tamnamore)**

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh and Lough Beg European sites between the Tamnamore Reactive Compensation 110kV New Equipment, Tamnamore – Turleenan 275kV Uprate and/or Turleenan – Omagh South – Donegal 275kV New Circuit projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

**Area 7 (Omagh)**

There is the potential for in-combination water quality and deterioration effects to occur in the River Foyle and Tributaries SAC or Lough Foyle European sites between the Omagh Main – Omagh South 110kV Restrung, Omagh Main Reactive Compensation New Equipment, Turleenan – Omagh South – Donegal 275kV New Circuit and/or Strabane to Omagh 110kV Uprate projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

**Area 8 (Magherafelt)**

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh European sites between the Coolkeeragh – Magherafelt 275kV Restrung and Magherafelt to Strabane 275kV or 110kV New Circuit projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

**Area 9 (Agivey)**

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh and Lough Beg European sites between the Agivey Cluster New Substation and Agivey Cluster to Limavady 110kV New Circuit projects if they were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

**Areas 10 (Killymallaght) and 11 (Strabane)**

There is the potential for in-combination water quality and deterioration effects to occur in the River Foyle and Tributaries SAC or Lough Foyle European sites between the Coolkeeragh to Strabane 110kV Uprate, Coolkeeragh to Killymallaght 110kV Uprate and/or Killymallaght to Strabane 110kV Uprate projects if any of them were to be progressed and constructed at the same time. Refer to Section 5.1.2 for a discussion on water quality and habitat deterioration effects.

**5.1.4.2 Other Energy and Sustainability Plans**

Table 5.1 lists other Energy and Sustainability Plans that have been considered for in-combination effects with implementation of the TDPNI. Where the Plans have been subject to a Habitats Regulations Assessment, the outcome of this assessment has been summarised in the table.

None of the other Energy and Sustainability Plans considered are predicted to result in adverse effects on the respective European sites considered in each of the assessments, in many cases with the application of plan level mitigation strategies and the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level prior to projects being consented.

When the implementation of these plans are considered in combination with TDPNI, and taking into consideration the measures intended to avoid or reduce the harmful effects of the plan on European sites

proposed both in the TDPNI (at section 6) and in each of these respective plans, adverse effects on the integrity of the European sites considered in this assessment are not predicted.

**Table 5.1: Other Energy and Sustainability Plans considered for in-combination effects**

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Grid 25/ Grid 25 Implementation Plan (IP) 2011-2016	Grid25 and its IP is a high-level strategy outlining how EirGrid intends to undertake the development of the electricity transmission grid in the short, medium and longer-terms, to support a long-term sustainable and reliable electricity supply.	<p>The core strategy must, among other aspects: -</p> <ul style="list-style-type: none"> <li>• Detail and take account of existing and proposed transmission infrastructure in a county;</li> <li>• Provide the framework for deciding on the scale, phasing and location of new development, having regard to existing serviced and planned investment over the coming years.</li> </ul>	<p>Grid25 IP has transboundary overlap with the TDPNI. Stage 1 Screening and Stage 2 Appropriate Assessment was carried out. The Grid25 IP has the potential to result in impacts to the integrity of the Natura 2000 network, if unmitigated.</p> <p>Plan level mitigation measures that will prioritise the avoidance of impacts in the first place and mitigate impacts where these cannot be avoided have been proposed. In addition, all lower level projects arising through the implementation of the IP will themselves be subject to Appropriate Assessment when further details of design and location are known.</p> <p>Having incorporated mitigation measures, Appropriate Assessment of the Grid25 IP concludes that it will not have a significant adverse effect on the integrity of the Natura 2000 network.</p>
Northern Ireland Strategic Energy Framework 2010	The Strategic Energy Framework (SEF 2010) is the result of examining the drivers, strengths, opportunities and threats to Northern Ireland's energy landscape and attempting to balance many diverse social, environmental and economic issues alongside their associated risks.	<p>The framework's four goals are to:</p> <ul style="list-style-type: none"> <li>• build competitive markets;</li> <li>• ensure security of supply;</li> <li>• enhance sustainability; and</li> <li>• develop energy infrastructure.</li> </ul>	The SEF was not subjected to HRA.
Offshore Renewable Energy Development Plan (DCENR, 2014) (Ireland)	The OREDP is a plan that identifies the opportunity for the sustainable development of Ireland's abundant offshore renewable energy resources for increasing indigenous production of renewable electricity, thereby contributing to reductions in our greenhouse gas emissions,	<ul style="list-style-type: none"> <li>• Ireland is obliged to reach a target of 16% of all energy consumed in the State coming from renewable sources by 2020.</li> <li>• This obligation is to be met by 10% in transport, 12% from heat and 40% from electricity</li> </ul>	AA of this Plan found that it would be possible to achieve the high scenario of 4,500MW from offshore wind and 1,500MW of wave and tidal devices without likely significant adverse effect on the environment. The findings of the AA set out the levels to which such development could be carried out without significant adverse effect on the environment.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Offshore Renewable Energy Strategic Action Plan 2012-2020	This Plan outlines the Executive's aim of Northern Ireland generating 900MW of energy from offshore wind and 300MW from tidal resources by 2020. This Plan is currently being implemented as offshore energy lease zones have been granted by the Crown Estate.	<ul style="list-style-type: none"> <li>Northern Ireland has a target of 40% electricity consumption from renewable resources by 2020.</li> </ul>	The sites for which the possibility of LSE on one or more interest features could not be excluded at the screening stage were brought forward to a Stage 2 assessment. The overall conclusion of the HRA is that the Plan will have no adverse effect on integrity of any sites subject to project level targeted ecological survey as required and inclusion and enforcement of all mitigation measures in the HRA.
Sustainable Energy Action Plan, 2012-2015 and beyond	<p>The Action Plan outlines the various initiatives being undertaken by the Northern Ireland Executive and includes a statement of leadership from the Executive, demonstrating a united and long-lasting commitment to sustainable energy.</p> <p>This Plan builds from the Strategy Energy Frameworks, 2010.</p> <ul style="list-style-type: none"> <li>Building energy markets</li> <li>Ensuring security supply</li> <li>Enhancing sustainability and development of competitive energy markets</li> <li>Increasing the level of electrify and heat from renewable sources</li> </ul>	<p>The aim is underpinned by three strategic objects:</p> <ul style="list-style-type: none"> <li>Reduce greenhouse gas emission from transport.</li> <li>Protect biodiversity</li> <li>Reduce water, noise and air pollution</li> </ul>	The Plan was not subject to HRA, but notes that all renewable energy projects taken forward under the OREAP (above) will have to be screened to determine the need for HRA.
The Northern Ireland Climate Change Adaptation Programme 2014-2019	<p>The Adaptation Programme provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each department will meet these objectives, and the timescales associated with the proposals and policies identified in the period up to 2019.</p> <p>Adaptation Programme, four primary areas for action are as follows:</p> <ul style="list-style-type: none"> <li>Flooding;</li> <li>Water;</li> <li>Natural Environment; and</li> <li>Agriculture and Forestry</li> </ul>	<p>The Adaptation Programme focuses on three adaptation principles:</p> <ul style="list-style-type: none"> <li>Integrating adaptation into relevant key policy areas;</li> <li>Developing the evidence base; and</li> <li>Communication and cooperation</li> </ul>	The Plan was not subject to HRA.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	The high level actions and key activities for each primary area have been identified within the Adaptation Programme.		
Northern Ireland Waste Management Strategy, 2012	The Waste Management Strategy sets out in detail those proposed policies, including specific actions to be taken. Strategy development is a continuous process and the Waste Management Strategy for Northern Ireland is considered as a living document, requiring regular review and revision to ensure that it remains relevant and the policies and actions therein remain appropriate.	<p>The proposals of this Strategy are as follows:</p> <ul style="list-style-type: none"> <li>• The development of a Waste Prevention Programme;</li> <li>• A new 60% recycling target for local authority collected municipal waste (LACMW);</li> <li>• The introduction of a statutory requirement on waste operators to provide specified data on commercial and industrial waste;</li> <li>• New and more challenging collection and recycling targets for packaging and WEEE;</li> <li>• The introduction of a landfill restriction on food waste;</li> <li>• The potential for the devolution of landfill tax;</li> <li>• The implementation of legislation on carrier bags;</li> <li>• The development of detailed proposals for an Environmental Better Regulation Bill.</li> </ul>	The Plan was not subject to HRA.
Waste Management Plans 2013 – 2020	The Waste Management Plan 2013-2020 outlines how it will efficiently manage waste for the Councils it represents with the overall goal of creating a system that 'meets the region's needs and contributes towards economic and sustainable development'. Subject to review every five years the Plan details how NI will fulfil its statutory obligations under the EU Waste Framework Directive and The Waste and Contaminated Land (Northern Ireland) Order 1997.	<p>The Action Plan proposes to:</p> <ul style="list-style-type: none"> <li>• Deliver a communications campaign to build public awareness, understanding of and confidence in recycling.</li> <li>• Undertake a Recycling Gap study to identify kerbside recycling options.</li> <li>• Provide £2.5m to the Rethink Waste Capital fund in 2016/17 with further government support planned for successive years.</li> <li>• Support the development of strategic infrastructure for treating and recovering waste;</li> <li>• and support separate treatment of food waste</li> </ul>	The Plans were not subject to HRA but refer to targets not to damage protected sites, not to damage or displace protected species and for no negative transboundary impacts on biodiversity, flora and fauna.

### **5.1.4.3 River Basin and Flood Risk Management Plans**

Table 5.2 lists River Basin and Flood Risk Management Plans that have been considered for in-combination effects with implementation of the TDPNI. Where these Plans have been subject to a Habitats Regulations Assessment, the outcome of this assessment has been summarised in the table.

None of the River Basin or Flood Risk Management Plans considered are predicted to result in adverse effects on the respective European sites considered in each of the assessments, in many cases with the application of plan level mitigation strategies and the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level prior to projects being consented.

When the implementation of these plans are considered in combination with TDPNI, and taking into consideration the measures intended to avoid or reduce the harmful effects of the plan on European sites proposed both in the TDPNI (at section 6) and in each of these respective plans, adverse effects on the integrity of the European sites considered in this assessment are not predicted.

**Table 5.2: River Basin Management Plans considered for in-combination effects**

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Draft 2 <sup>nd</sup> River Basin Management Plan 2018-2021 (2017) (Ireland)	Aims to set out river basin management planning in Ireland. This leads on from the 1 <sup>st</sup> Cycle River Basin Management Plans: 2009-2014.	<ul style="list-style-type: none"> <li>• Details the most recent water quality results and the outcomes of the risk characterisation process.</li> <li>• Informs on the significant pressures for at-risk water bodies.</li> <li>• Sets out the environmental objectives of the WFD and the priorities.</li> <li>• Outlines the key measures aimed at meeting our environmental objectives.</li> <li>• Outlines measures to be taken to improve stakeholder engagement.</li> </ul>	A NIS was prepared for the 2 <sup>nd</sup> cycle RBMP, which concludes that actions arising out of the RBMP shall be required to include measures preventing pollution or other environmental effects likely to adversely affect the integrity of European Sites, and where applicable projects arising from the implementation of the RBMP will themselves be subject to screening for AA and where relevant, AA.
North Western River Basin Management Plan	<p>Describes existing condition of waters in the international River Basin District, the objectives for improving their condition and the measures to be used to deliver these improvements.</p> <ul style="list-style-type: none"> <li>• Establish a framework for the protection of water bodies at River Basin District (RBD) level</li> <li>• Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of water bodies in that RBD</li> <li>• Promote sustainable water usage</li> </ul>	<ul style="list-style-type: none"> <li>• Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive</li> <li>• Identifies and manages water bodies in the RBD</li> <li>• Establishes a programme of measures for monitoring and improving water quality in the RBD</li> <li>• Involves the public through consultations</li> <li>• RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.</li> </ul>	The plan was subject to HRA prior to its adoption. The outcome of this assessment found that the plan was unlikely to give rise to any significant effects upon Natura 2000 sites at this stage.
Neagh Bann River Basin Management Plan	<p>Describes existing condition of waters in the international River Basin District, the objectives for improving their condition and the measures to be used to deliver these improvements.</p> <ul style="list-style-type: none"> <li>• Establish a framework for the protection of water bodies at River Basin District (RBD) level</li> <li>• Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of water bodies in that RBD</li> </ul>	<ul style="list-style-type: none"> <li>• Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive</li> <li>• Identifies and manages water bodies in the RBD</li> <li>• Establishes a programme of measures for monitoring and improving water quality in the</li> </ul>	The plan was subject to HRA prior to its adoption. The outcome of this assessment found that the plan was unlikely to give rise to any significant effects upon Natura 2000 sites at this stage.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	<ul style="list-style-type: none"> <li>Promote sustainable water usage</li> </ul>	RBD <ul style="list-style-type: none"> <li>Involves the public through consultations</li> <li>RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.</li> </ul>	
North Eastern River Basin Management Plan	Describes existing condition of waters in the River Basin District, the objectives for improving their condition and the measures to be used to deliver these improvements. <ul style="list-style-type: none"> <li>Establish a framework for the protection of water bodies at River Basin District (RBD) level</li> <li>Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of water bodies in that RBD</li> <li>Promote sustainable water usage</li> </ul>	<ul style="list-style-type: none"> <li>Aims to improve water quality and quantity within inland surface waters (rivers and lakes), transitional waters coastal waters and groundwater and meet the environmental objectives outlined in Article 4 of the Water Framework Directive</li> <li>Identifies and manages water bodies in the RBD</li> <li>Establishes a programme of measures for monitoring and improving water quality in the RBD</li> <li>Involves the public through consultations</li> <li>RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.</li> </ul>	The plan was subject to HRA prior to its adoption. The outcome of this assessment found that the plan was unlikely to give rise to any significant effects upon Natura 2000 sites at this stage.
Northern Ireland Flood Risk Management Plans	Flood Risk Management Plans (FRMPs) are a key requirement of the Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) and are aimed at reducing the potential adverse consequences of significant floods on human health, economic activity, cultural heritage and the environment. The FRMPs are coordinated at the River Basin District level to align with the Water Framework Directive’s River Basin Management Plans and focus on managing the flood risk in the twenty Significant Flood Risk Areas (SFRAs). FRMPs have been prepared for the North Western, North Eastern and Neagh-Bann River Basin Management areas.	The FRMPs address all aspects of flood risk management, focusing on prevention, protection and preparedness and take into account the characteristics of the particular river catchments in which the SFRAs are located. Key elements contained within the FRMPs include: <ul style="list-style-type: none"> <li>A description of the objectives set for the management of flood risks.</li> <li>Identification of structural and non-structural measures for achieving those objectives within each SFRA and their priority.</li> <li>A summary of the information and consultation measures taken in connection with the preparation of the FRMPs and a description of the coordination process with the Republic of Ireland’s Office of Public Works in relation to our shared International River Basin Districts.</li> </ul>	The approaches proposed within the Plans are grouped under three main measures: <ul style="list-style-type: none"> <li>Prevention</li> <li>Preparedness</li> <li>Protection</li> </ul> The HRA of FRMPs found that approaches proposed under Prevention result in no potential significant impacts to the integrity of any European sites. Approaches proposed under Preparedness result in no potential significant impacts to the integrity of any European sites. Approaches proposed under Protection include the possibility of structural approaches, and may

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
			<p>result in potentially significant impacts upon European sites, but that at a project level, structural approaches will require consent including project level HRA and targeted mitigation as necessary to ensure no adverse effect on integrity.</p>
<p>River Basin – Local Management Area Action Plans</p>	<p>Local Management Area Action Plans implement the WFD River Basin Management Plans within the 2010 to 2015 planning cycle. The action plans detail the local measures identified to improve the water environment. Action Plans are available for the following Management Areas:</p> <ul style="list-style-type: none"> <li>▪ Bush</li> <li>▪ Lagan</li> <li>▪ South Down</li> <li>▪ Strangford</li> <li>▪ Belfast Lough</li> <li>▪ Glens and Rathlin</li> <li>▪ Quoile</li> <li>▪ Larne Lough</li> </ul>	<p>Local Management Areas (LMAs) were derived from surface water bodies. They were created to manage and improve water quality at a local level through local involvement.</p>	<p>The various specific LMA Action Plans have not been subject to HRA.</p>

#### **5.1.4.4 Land Use Area Plans**

Table 5.3 lists Land Use Area Plans that have been considered for in-combination effects with implementation of the TDPNI. Where these Plans have been subject to a Habitats Regulations Assessment, the outcome of this assessment has been summarised in the table.

None of the Land Use Area Plans considered are predicted to result in adverse effects on the respective European sites considered in each of the assessments, in many cases with the application of plan level mitigation strategies and the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level prior to projects being consented.

When the implementation of these plans are considered in combination with TDPNI, and taking into consideration the measures intended to avoid or reduce the harmful effects of the plan on European sites proposed both in the TDPNI (at section 6) and in each of these respective plans, adverse effects on the integrity of the European sites considered in this assessment are not predicted

**Table 5.3: Land Use Area Plans considered for in-combination effects**

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Regional Development Strategy for Northern Ireland 2025	A Strategy to guide the future development of Northern Ireland to 2025. The RDS will be material to decisions on planning applications and appeals.	<p>The 8 aims of the RDS are:</p> <ul style="list-style-type: none"> <li>• Support strong, sustainable growth for the benefit of all parts of Northern Ireland</li> <li>• Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West</li> <li>• Support our towns, villages and rural communities to maximise their potential</li> <li>• Promote development which improves the health and well-being of communities</li> <li>• Improve connectivity to enhance the movement of people, goods, energy and information between places</li> <li>• Protect and enhance the environment</li> <li>• Take actions to reduce our carbon footprint and facilitate adaptation to climate change</li> <li>• Strengthen links between north and south, east and west, with Europe and the rest of the world</li> </ul>	The Plan was not subject to HRA.
The Regional Development Strategy 2035 – Shaping Our Future	The strategy aims to take account of the economic ambitions and needs of the Region, and put in place spatial planning, transport and housing priorities that will support and enable the aspirations of the Region to be met.		The Strategy was subject to HRA. This assessment concluded that subject to the strategy appropriately taking account of the predicted potential effects upon European designated sites, the strategy would have little potential to give rise to any significant adverse effects on Natura 2000 sites.
A Planning Strategy for Rural Northern Ireland	This document considers the inter-relationships between town and country and seeks to present a clear vision for the future development of the rural area.	<ul style="list-style-type: none"> <li>• Strategic Objectives:</li> <li>• to protect and enhance the natural and man-made environment;</li> <li>• to meet the future development needs of the rural community;</li> <li>• to facilitate regeneration of the rural economy;</li> <li>• to accommodate change, while maintaining the character of the countryside;</li> <li>• to revitalise rural towns and villages in order to</li> </ul>	The Plan was not subject to HRA, however European sites are broadly addressed at Regional Policy CON 1.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
		<p>make them more attractive places in which to live and work; and</p> <ul style="list-style-type: none"> <li>to promote a high quality of design new development</li> </ul>	
Antrim, Ballymena and Larne Plan 2016 – Issues Paper	The Plan will play a major role in guiding the future development of the Antrim, Ballymena and Larne Borough Council areas over the Plan period. In so doing, it will help to give effect to the Regional Development Strategy 2025 (RDS), published on 20th September 2001, which provides an overarching strategic framework to help achieve a strong balanced economy, a healthy environment and an inclusive society, in accordance with the Programme for Government 2001.	Identifies issues of relevance to the area and outlines principles for future development of area.	As the associated Plan is in development this paper has not as of yet, been subject to HRA. However European sites issues are addressed at 5.7.1.
Antrim Area Plan 1984 – 2001	Previous Area Plan for the Antrim Borough Council area that set out the development framework until 2001.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Ards and Down Area Plan 2015	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within Ards Borough and Down District over the Plan period 2000 -2015.	Identifies issues of relevance to the area and outlines principles for future development of area	The Plan was subject to HRA, undertaken by NIEA. While a number of Natura 2000 sites were identified as requiring AA, it was concluded that the Plan would not result in any significant adverse effects upon any European designated sites.
Armagh Area Plan 2004	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area. This development plan remains the statutory instrument for its particular plan area, however a new development plan covering this area is being prepared. See Armagh Area Plan 2018 – Issues Paper.	Identifies issues of relevance to the area and outlines principles for future development of area	The Plan was not subject to HRA.
Armagh Area Plan 2018 –	The Armagh Area Plan 2018 provides a policy	Identifies issues of relevance to the area and	As the associated Plan is in development this

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Issues Paper	framework for development and conservation of Armagh, acting as a blueprint for land use decisions affecting housing, industry, tourism, retailing, roads, transportation, open space, and community facilities. It also protects the environment through designations and policies such as the Green Belt Policy, Countryside Policy Areas.	outlines principles for future development of area.	paper has not as of yet, been subject to HRA.
Ballymena Area Plan 1986-2001	This development plan remains the statutory Previous Area Plan for the Ballymena Borough Council area that set out the development framework until 2001.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Banbridge Rural Area Plan 1986 – 1998	This development plan remains the statutory instrument for its particular plan area; however a new development plan covering this area is being prepared.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Banbridge, Newry and Mourne Area Plan 2015	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2015. The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2010.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was subject to HRA, undertaken by the Department for the Environment Northern Ireland, in 2013. While a number of Natura 2000 sites were deemed to require Appropriate Assessment, it was concluded that the Plan would not result in any significant adverse effect upon any European designated sites.
Belfast Metropolitan Area Plan 2015	The purpose of the Plan is to inform the general public, statutory authorities' developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Belfast Metropolitan Area over the Plan period. The Plan will help to give effect to the Regional Development Strategy. The Plan covers Belfast City, Lisburn City, Carrickfergus Borough, Castlereagh Borough, Newtownabbey Borough and North Down Borough Councils.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was subject to HRA, undertaken by the Department for the Environment Northern Ireland. While a number of Natura 2000 sites were deemed to require Appropriate Assessment, it was concluded that the Plan would not result in any significant adverse effect upon any European designated sites.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Cookstown Area Plan 2010	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2010.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Craigavon Area Plan 2010	The purpose of the Plan is to inform the general public, statutory authorities and other interested bodies within the context of the Adopted Area Plan 2010, of the policy framework and designations that will be used to guide retail development decisions within the Craigavon Borough.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA. European sites and any associated impacts are given brief consideration within the Natural Heritage section (pg. 53).
Derry Area Plan 2011	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2011.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Dungannon & South Tyrone Area Plan 2010	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within Dungannon and South Tyrone Borough.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA. Internationally designated sites, including SACs, SPAs and Ramsar sites are addressed within the relevant section on conservation (pg. 63-67).
Fermanagh Area Plan 2007	The Fermanagh Area Plan sets out the policies and proposals to guide development decisions in the Fermanagh District Council area up to the year 2007.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA however, in the section entitled Natural Environment it is stated that due consideration will be given to the Habitats Regulations and associated designated sites. This is captured within the objective: To protect and where possible enhance wildlife and habitats of nature conservation importance.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
Larne Area Plan 2010	Previous Area Plan for the Larne Borough Council area that set out the development framework until 2010.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA however, in the section entitled Natural Environment (pg. 22) it is stated that due consideration will be given to the Habitats Regulations and associated designated sites.
Magherafelt Area Plan 2015	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2015.	Identifies issues of relevance to the area and outlines principles for future development of area.	The plan was subject to HRA by NIEA on behalf of the Planning and Local Government Group. This assessment concluded that no significant effects would arise as a result of the plan subject to the implementation of mitigation measures, in line with the precautionary principle.
Newry and Mourne Rural Area Subject Plan 1986 – 1999	This development plan remains the statutory instrument for its particular plan area; however a new development plan covering this area is being prepared.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Northern Area Plan 2016 (Ballymoney, Coleraine, Limavady & Moyle)	The purpose of the Plan is to inform the general public, statutory authorities, developers and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within the Plan area for the period up to 2016.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was subject to HRA by the Department of the Environment Northern Ireland. All 23 Natura 2000 sites within the plan area were deemed to require an appropriate assessment. No significant adverse effects were identified however this was subject to the implementation of appropriate mitigation measures in respect of 18 of these designated sites.
Omagh Area Plan 1987 – 2002	This development plan remains the statutory instrument for its particular plan area; however a new development plan covering this area is being prepared.	Identifies issues of relevance to the area and outlines principles for future development of area.	The Plan was not subject to HRA.
Strabane Area Plan 1986 – 2001	This development plan remains the statutory instrument for its particular plan area; however a new development plan covering this area is being prepared.	Identifies issues of relevance to the area and outlines principles for future development of area.	The plan was not subject to HRA. However, at section 19.2 it is stated that the plan and forthcoming developments will be assessed in respect of impacts upon the supported Areas of Special Scientific Interest (ASSI) , of which one, Moneygal Bog , is now designated as an

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
			SAC.
West Tyrone Area Plan 2019 Issues Paper	The West Tyrone Area Plan (WTAP) will be one of the series of development plans covering Northern Ireland. The Plan will replace the Strabane Area Plan 1986-2001 and the Omagh Area Plan 1987-2002 and will cover the combined area as defined by the political boundaries of Omagh and Strabane District Councils. It is proposed that the plan period will address land use needs up until 2019.	Identifies issues of relevance to the area and outlines principles for future development of area.	As the plan is in development it has not as of yet, been subject to HRA. However the plan, at page 40, details that any policies which arise as part of the plan will have regard to impacts upon nationally and internationally designated sites.

## 6 AVOIDANCE AND MITIGATION

The section sets out the strategic approach to mitigation to address potential adverse effects on the integrity of European sites outlined in Table 4.3 above. The mitigation hierarchy (Table 6.1) highlights the need to focus on the avoidance and minimising aspects of mitigation.

**Table 6.1: Mitigation Hierarchy**

<b>Avoidance</b>	Seek options that avoid harm to ecological features (for example, by locating project on an alternative site).
<b>Mitigation</b>	Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation
<b>Compensation</b>	Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
<b>Enhancement</b>	Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation

Where a likely significant adverse effect has been identified (or cannot be discounted) during Plan level HRA, mitigation measures can be implemented to address the adverse effect. This section outlines the mitigation measures proposed. Measures listed here derive from EirGrid's (2012) *Ecology Guidelines for Electricity Transmission Projects - A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects*, and a review of the Natura impact statement prepared for EirGrid's soon to be published Implementation Plan 2017-2022 as it is a similar endeavour to SONI's TDPNI.

### 6.1 AVOIDANCE

The TDPNI is strategic and does not define the precise location or route of any potential project that may arise from it. Avoidance measures will be carried out at the earliest opportunity at the project stage. SONI has adopted the mitigation hierarchy (Table 6.1) in their approach to the development of linear infrastructure in order to avoid impacts on the integrity of European sites within the Natura 2000 network.

In developing future projects SONI will seek to find options that avoid impacts on European sites (for example, by assessing alternative route options). Linear infrastructure that is developed through the implementation of the TDPNI will be subject to Constraints Studies and Route or Site Selection Studies. Through these processes, significant direct and indirect effects on European sites can be identified and avoided where possible. Any future projects developed as a result of the draft Grid IP will be subject to examination of constraints, route selection and project level AA.

Screening for and/or appropriate assessment will be carried out on all relevant projects and where impacts are identified that may prevent achieving conservation objectives for the features of any given European site, mitigation measures will be proposed to ensure that does not happen. This will be informed by detailed ecological survey and assessment, so that sensitive receptors are avoided. Avoidance of European sites, including SACs and SPAs, will always be a key consideration informing route options.

As a high level strategy or vision for the development of the electricity transmission network within Northern Ireland, the TDPNI provides an indication of the types of infrastructural requirements likely to arise in the future, subject to Government policy on renewable energy and predicted growth in demand. The IP therefore does not prescribe exactly the location of infrastructure such as substations and transformers, or the route of transmission lines or cables. Instead it provides an indicative overview of the general approach proposed for the future development of the grid. Notwithstanding the dynamic nature of the plan, all projects that are developed

through the plan will be subject to appropriate assessment at a project level where this is required in accordance with EirGrid (2012).

Assessment of impacts for a project where the design details are known and where the location and route of infrastructure has been confirmed through constraints studies and route selection process will allow for accurate prediction of effects on European sites, their protected species and habitats.

## 6.2 MITIGATION

Appropriate Assessment of individual projects will include timely consultation with relevant planning and environmental authorities, the evaluation of up to date mapping, designations and development plans, policies, and a consideration of any relevant sectoral guidance, such as EC Guidance on Energy Transmission Infrastructure and EU nature legislation (EC, 2018) and updated Ecology Guidelines for Electricity Transmission Project when published by EirGrid.

Where avoidance is not possible adverse effects on site integrity will be avoided through project specific mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation. Mitigation measures shall aim to ensure that no adverse effect on the integrity of a European site.

Where impacts are identified at project level, appropriate mitigation will be developed to ensure the resulting impacts of the construction and operation of a project do not adversely affect the integrity of a European site in view of the site's conservation objectives. Best practice measures identified in EirGrid's benchmarking Evidence-Based Environmental Studies<sup>1</sup>.

The following measures will be incorporated into future project specific HRAs and ECIAs, where appropriate. This list of mitigation measures is not designed to be exhaustive and shall be supplemented by project and site specific mitigation developed by project level Appropriate Assessment and Environmental Impact Assessment.

### 6.2.1 Habitat loss

Any and all works in or in proximity to a European site will be supervised by an experienced ecologist acting as an Ecological Clerk of Works (ECOW).

Direct habitat loss within European sites will be avoided for new-build infrastructure and avoided where reasonably practicable for refurbishment of infrastructure within European sites.

When construction occurs within a designated site, sensitive construction techniques will be used such as the use of bog mats for machinery access, particularly if underground cables are proposed or in remote peatland areas.

Ecological monitoring will be undertaken at sensitive sites during construction as appropriate. Such sites will be identified on a case by case basis.

Restricted working areas will be imposed to ensure minimal disturbance to sensitive habitats.

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<sup>1</sup> <http://www.eirgrid.ie/about/in-the-community/environment/>

Re-distribute vegetation and soil stripped from the construction areas to provide a seedbank and do not re-seed with Perennial Ryegrass.

Land within the working area will be reinstated to its former condition or as near as is reasonably practicable.

### **6.2.1.1 Invasive Species**

There is the potential for non-native invasive species to be present in proximity to a future project. The introduction of invasive species into a European site can affect the conservation objectives for qualifying habitats or species, potentially adversely affecting the integrity of the European site (e.g. affecting species distribution and abundance and/or out competing native species). Invasive species survey will be undertaken as part of the suite of ecology surveys for projects arising from the TDPNI if appropriate and in accordance with EirGrid (2012). If invasive species are found to be present an Invasive Species Management Plan will be prepared to outline control and or removal measures to ensure such species are not spread during construction or operation of any future projects.

### **6.2.1.2 Peatland sites**

Areas of deep and active peat shall be avoided, where possible.

Detailed peat slip risk assessments shall be carried out as determined on a case by case basis for proposed developments in areas where peat substrates occur on sloped ground.

Construction machinery shall be restricted to site roads and designated access routes. Machinery shall not be allowed to access, park or travel over areas outside development construction zones.

Peat excavated during construction activity should not be stored (temporarily or otherwise) on areas of adjacent mire habitats or near flushes or drains. Temporary storage of spoil material excavated during the construction phase developments should be stored at suitable locations away from surface watercourses.

All spoil material excavated during the construction phase should be reinstated following the completion of the construction phase of a proposed development.

Where disturbance of peat soils cannot be avoided, there should be some consideration given to possible re-seeding with native species to stabilise the peat and accelerate recovery of vegetation.

## **6.2.2 Water Quality and Habitat Deterioration**

In all cases where works have the potential to impact on protected surface water or riparian habitats within or upstream of a European site, measures must be put in place to manage and minimise the risk of escape of elevated levels of suspended solids or polluting substances into watercourses.

Develop, implement and enforce an Erosion and Sedimentation Control Plan (ESCP) where risks are identified to downstream European sites.

The ESCP must include sufficient pollution control measures to prevent run-off, silt, hydrocarbons or any other harmful substances or substrates from entering any surrounding surface waters.

Storage facilities would contain and prevent the release of fuels, oils and chemicals associated with plant, refuelling and construction equipment into the environment.

All protective coatings used would be suitable for use in the aquatic environment and used in accordance with best environmental practice.

Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites. This should include good site practices as described in NIEA Pollution Prevention Guidance (DAERA, 2016) and applicable CIRIA Technical Guidance (CIRIA, 2001; CIRIA, 2006) including methods and procedures to deal with any spills and the timely reporting of incidents.

- There shall be no in-stream crossing by machinery.
- Silty water will be collected in settlement ponds prior to discharge to watercourses.
- Buffering strips will be provided near watercourses.
- All works involving open cut crossings shall be carried out during the period May to September to avoid interruption of salmonid spawning runs, spawning, incubation of eggs and the early developmental stages.
- Where appropriate and practical, bank vegetation and bed material which has been removed shall be stored to facilitate its replacement when channel works in the vicinity of a watercourse have been completed.
- Works in the vicinity of a watercourse shall be carried out with reference to a water quality protection or surface water management plan for each site which shall ensure that:
- All necessary measures shall be taken to minimise the generation and release of sediments into all watercourses.
- Levels of suspended solids in the river shall be monitored during the course of the works.
- Precautions shall be put in place to avoid spillages of diesel, oil or other polluting substances.

## 6.2.3 Disturbance and Displacement

### 6.2.3.1 Birds

Where feasible, site clearance involving the cutting or destruction of vegetation and hedgerows shall not take place in the bird breeding season between March 1st and August 31st inclusive.

Mitigation measures to reduce disturbance effects on feature species birds may include but not be limited to:

Timing of works (e.g. avoiding works in or close to SPAs during the bird breeding season [March to August inclusive] or avoiding works in the vicinity of SPAs with over wintering birds between the months of November and March inclusive)

Avoid working simultaneously with other projects which could also cause disturbance.

Screening of works to reduced disturbance impacts.

On the advice of relevant ornithological experts and agencies, conduct surveys where the risk of collision on migratory routes cannot be excluded at screening stage. Bird warning devices shall be put in place where crossings of sensitive flight corridors cannot be avoided and where a collision risk occurs.

Surveys focusing on feature species which can move outside the confines of a European site shall be conducted to ensure any significant areas of supporting habitat (e.g. foraging areas for feature species birds in close proximity to, but outwith an SPA; or otter holts out with an SAC, etc.) would be identified and avoided or appropriate mitigation measure put in place.

### **6.2.3.2 Otters**

Works shall avoid active otter holts. In the event that an otter holt cannot be avoided by the works, it will be necessary to seek a derogation licence from NIEA to exclude otters from the holt. No works shall be undertaken within 150m of any holts at which breeding females or cubs are present.

No wheeled or tracked vehicles (of any kind) shall be used within 30m of non-breeding otter holts. Light work, such as digging by hand or scrub clearance shall also not take place within 30m of such holts, except as agreed with NIEA under licence.

### **6.2.3.3 Marine Mammals**

Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010) will be followed for marine based cable laying activities.

## 7 CONCLUSION

Having regard to the relevant legislation and the methodology followed and conclusions of a screening stage exercise, a shadow HRA of the TDPNI was prepared to document an appropriate assessment of the implications of the TDPNI on European sites in view of their conservation objectives.

The HRA considered three broad impact themes and focused on the following possible LSEs as outlined in Table 4.3:

- The possibility of likely significant **Habitat Loss** effects cannot be discounted for forty five European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
- The possibility of likely significant **Water Quality and Habitat Deterioration** effects cannot be discounted for forty four European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.
- The possibility of likely significant **Disturbance and Displacement** effects cannot be discounted for twenty nine European sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on European sites.

Having conducted further investigation and analysis; and having applied measures appropriate at a plan level intended to avoid or reduce the harmful effects of the implementation of the plan on European sites; and taking into consideration the safeguarding regime of lower level screening for appropriate assessment or appropriate assessment as the case may be at a project level for each of the projects brought forward from the TDPNI prior to those projects being consented under the planning code; it is concluded that implementation of the TDPNI will not adversely affect the integrity of any European site.