HABITATS REGULATIONS ASSESSMENT

Transmission Development Plan for Northern Ireland 2023-2032

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1 INTRODUCTION

1.1 Background

This Habitats Regulations Assessment (HRA) has been prepared by RPS on behalf of the System Operator for Northern Ireland (SONI) and examines whether or not the proposed Transmission Development plan for Northern Ireland, is likely to give rise to adverse effects on the integrity of sites protected as part of the UK National Site Network (SPAs and SACs in Northern Ireland) in addition to relevant Natura 2000 sites within the Republic of Ireland (RoI).

The report has been prepared to assist SONI in their role as a Competent Authority in fulfilling their duties in accordance with Regulation 43 of the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).

These regulations transpose *inter alia* Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, and remain relevant following the UK's departure from the EU. This approach is in line with the Conservation (Natural Habitats, etc.) Regulations (Amendment) (Northern Ireland) (EU Exit) Regulations 2019. Terminology used in this report is in line with guidance published by DAERA in light of changes to the status of European sites following the UK's departure from the EU (DAERA 2020).

It is intended that the findings of this plan will identify the potential for measures within the TDPNI to give rise to adverse effects upon the integrity of the relevant sites and to identify where the proposed policies can be amended, as a form of high-level mitigation, or where further measures are required at implementation, to address any potential impacts upon the integrity of sites as required.

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.

1.2 Overlap with Strategic Environmental Assessment

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).

There is a degree of overlap between the requirements of the SEA and HRA and in accordance with best practice, an integrated process of data sharing has been carried out, such as sharing of baseline data and mapping of UK National or European Sites, sharing of the potential ecological effects of the TDPNI.

It is also noted that there are issues relevant to the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) that are not strictly related to HRA but can be addressed under SEA, including and the management of features of the landscape which are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species (Article 10 of the Habitats Directive), and the regime of strict protection for Annex IV species (European Protected Species) under Article 12 of the Habitats Directive.

EC (2021) advises that there are several advantages to streamlining SEA and appropriate assessments in that they can, for instance, help to better understand the relationships between different environmental factors, avoid duplication of assessments, contribute to making more efficient use of resources needed to carry out the assessments, and enable better coordination in permitting procedures.

Key elements for effective streamlining of appropriate assessment and SEA include:

- close cooperation between responsible authorities;
- adequate scoping, which is a common practice in the SEA procedure;
- close cooperation and proper information exchange between the experts preparing the SEA and the experts conducting the appropriate assessment (e.g. information about noise, air, water, soil issues by the respective expert to the expert in biodiversity);
- quality control by the competent authority;
- clear and distinct conclusions for each of the streamlined assessment procedures.

1.3 Appropriate Assessment

Regulation 43 of the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) states:

"(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—

(a) is likely to have a significant effect on a European site in Northern Ireland (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of the site, shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

(2) A person applying for any such consent, permission or other authorisation shall provide such information as the competent authority may reasonably require for the purposes of the assessment.

(3) The competent authority shall for the purposes of the assessment consult the Department and have regard to any representations made by it within such reasonable time as the authority may specify.

(4) The competent authority shall, if it considers it appropriate, take such steps as it considers necessary to obtain the opinion of the general public.

(5) In the light of the conclusions of the assessment, and subject to regulation 44, the authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which it proposed that the consent, permission or other authorisation should be given."

In simple terms, a plan must be screened for appropriate assessment to ascertain whether or not likely significant effects on the UK national site network i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites; can be excluded. If not, the plan must be subject to appropriate assessment.

2 METHODOLOGY

2.1 Guidance on Appropriate Assessment

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). The purpose of the guidance 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 former 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 in relation to Natura 2000 sites – Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC' (EC, 2021), 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, including DAERA's guidance on the application of the Habitat Regulations post-Brexit (DAERA, 2020):

- Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);
- 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; (EC, 2007);
- The Appropriate Assessment of Plans in Northern Ireland. RSPB, Belfast (RSPB, 2008);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013);
- European Commission Notice C(2018) 7621 '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, 2019);
- Institute of Air Quality Management 'A guide to the assessment of air quality impacts on designated nature conservation sites (Version 1.1)' (IAQM, 2020);
- Guidance explaining The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 (DAERA, 2020); and
- European Commission Notice C(2021) 6913 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC', Office for Official Publications of the European Communities, Luxembourg (EC, 2021).

2.2 Approach

2.2.1 Stages of the Appropriate Assessment Process

An appropriate assessment is a three-stage process:

- The first stage involves a screening for appropriate assessment;
- The second stage arises where, having screened the proposed development, the competent authority determines that an appropriate assessment is required, in which case it must then carry out that appropriate assessment; and
- The third stage is a derogation procedure where adverse effects upon the integrity of a site remain, but the project must nonetheless proceed for imperative reasons of overriding public interest.

According to European Commission guidance documents 'Assessment of plans and projects significantly affecting Natura 2000 sites' (EC, 2001) and the 'Managing Natura 2000 sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC' (EC, 2019), the obligations arising under Article 6 establish a stepwise procedure for Habitats Regulations Appraisal as follows, and as illustrated in Box 1.

The first part of this procedure consists of a pre-assessment stage ('screening') to determine whether, firstly, a plan or project is directly connected with or necessary to the management of the site, and secondly, whether it is likely to have a significant effect on the site; it is governed by the first sentence of Article 6(3).

The second part of the procedure, governed by the second sentence of Article 6(3), relates to the appropriate assessment and the decision of the competent national authorities.

A third part of the procedure (governed by Article 6(4) comes into play if, despite a negative assessment, it is proposed not to reject a plan or project but to give it further consideration. In this case Article 6(4) allows for derogations from Article 6(3) under certain conditions.

The extent to which the sequential steps of Article 6(3) apply to a given plan or project depends on several factors, and in the sequence of steps, each step is influenced by the previous step. The order in which the steps are followed is therefore essential for the correct application of Article 6(3).

Each step determines whether a further step in the process is required. If, for example, the conclusion at the end of a Stage 1 screening appraisal is that significant effects on European sites can be excluded, there is no requirement to proceed to the next step. The steps are illustrated in **Figure 2.1**, extracted from EC (2021).

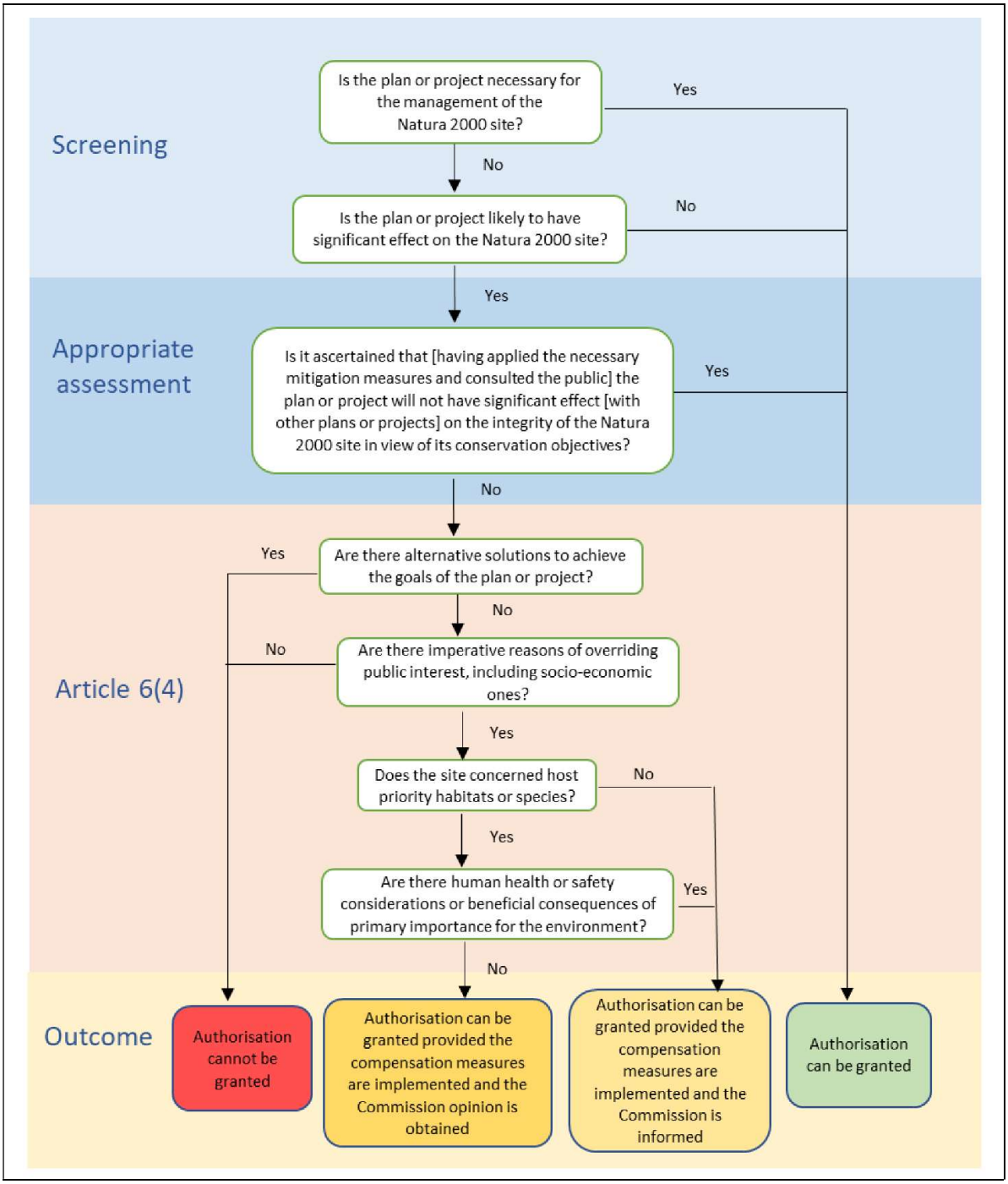


Figure 2.1: Step-wise procedure of Appropriate Assessment (from EC, 2021)

2.2.2 Likely Significant Effect

The Commission's 2018 Notice (EC, 2019) advises that the appropriate assessment procedure under Article 6(3) is triggered not by the certainty but by the likelihood of significant effects, arising from plans or projects regardless of their location inside or outside a protected site. Such likelihood exists if significant effects on the site cannot be excluded. The significance of effects should be determined in relation to the specific features and environmental conditions of the site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise 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 LSEs.

Case law of the CJEU 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 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.

2.2.3 Consideration of *ex-situ* effects

EC (2019) advises that Member States, both in their legislation and in their practice, allow for the Article 6(3) safeguards to be applied to any development pressures, including those which are external to European sites but which are likely to have significant effects on any of them.

The CJEU developed this point when it issued a ruling in case C-461/17 ("Brian Holohan and Others v An Bord Pleanála") that determined inter alia that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an appropriate assessment must on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.

In that regard, consideration has been given in this assessment to implications for habitats and species located both inside and outside of the European sites considered in the screening appraisal with reference to those sites' Conservation Objectives where effects upon those habitats and/or species are liable to affect the conservation objectives of the sites concerned.

2.2.4 Mitigation Measures at Screening Stage

In determining whether or not likely significant effects will occur or can be excluded in the Stage 1 appraisal, measures intended to avoid or reduce the harmful effects of the proposed development on European sites, (i.e. "mitigation measures") or best practice measures were not taken into account. This approach is consistent with up-to-date EU guidance (EC, 2019; EC, 2021) and the case law of the CJEU.

EC (2001) states that "*project and plan proponents are often encouraged to design mitigation measures into their proposals at the outset. However, it is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site*". This direction in the European Commission's guidance document is unambiguous in that it does not permit the inclusion of mitigation at screening stage.

In April 2018, the Court of Justice of the European Union issued a ruling in case C-323/17 People Over Wind & Peter Sweetman v Coillte Teoranta ("People Over Wind") that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce

the harmful effects of the plan or project on that site. The judgment in People Over Wind is further reinforced in EC (2019) and EC (2021) which refers to CJEU Case C-323/17.

It is noted that for the FAPP, which in part aims to improve ecological impacts associated with agricultural activity across Northern Ireland, includes policies which comprise a broad form of mitigation for the unmitigated impacts potentially associated with agriculture in the absence of such a policy in future. Mitigation measures for the purposes of HRA would require additional measures to those set out within the FAPP, which would reduce or eliminate, where relevant, the already reduced impacts of agricultural activity arising as a result of the FAPP, which may nevertheless give rise to adverse impacts upon the integrity of UK National or European Sites.

2.2.5 UK Departure from the EU

It is recognised that following the United Kingdom's departure from the European Union, SACs and SPAs in the UK are no longer considered "Natura 2000 sites" for the purpose of an assessment pursuant to Article 6(3) of the Habitats Directive. However, pursuant to the UK's Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, those sites still retain the same protection under UK law as they did prior to the UK's exit from the EU.

In the circumstances, and consistent with the UK's obligations as a signatory to the Bern Convention on the Conservation of European Wildlife and Natural Habitats, to which the Birds and Habitats Directives give effect, and in order to ensure the highest level of protection for the species and habitats protected by those Directives, the following assessment includes a full assessment of relevant RoI sites forming part of the Natura 2000 network of sites protected under those Directives.

This will enable the competent authority to ensure that there be will no adverse effect on the integrity of those RoI sites and the UK national site network.

2.2.6 In Combination Effects

Article 6(3) of the Habitats Directive and Article 43 of the Conservation (Habitats Etc.) Regulations requires that in-combination effects with other plans or projects are also considered. As set out in the Commission's 2018 Notice (EC, 2019), significance will vary depending on factors such as magnitude of impact, type, extent, duration, intensity, timing, probability, cumulative effects and the vulnerability of the habitats and species concerned. Whilst the Directive does not explicitly define which other plans and projects are within the scope of the in-combination provision of Article 6(3), it is important to note that the underlying intention of this provision is to take account of cumulative impacts, and these will often only occur over time.

In that context, one can consider plans or projects which are completed, approved but uncompleted, or proposed. EC (2019) specifically advises that "*as regards other proposed plans or projects, on grounds of legal certainty it would seem appropriate to restrict the in-combination provision to those which have been actually proposed, i.e. for which an application for approval or consent has been introduced*".

EC (2021) additionally advises that –

- an in-combination assessment is often less detailed at the screening stage than in the appropriate assessment;
- there is still a need to identify all other plans or projects that could give rise to cumulative impacts with the plan or project in question and
- if this analysis cannot reach definitive conclusions, it should at least identify any other relevant plans and projects that should be scrutinised in more detail during the appropriate assessment.

2.2.7 Plan Level Appropriate Assessment

Recent guidance published by the European Commission (EC 2021), sets out a number of pertinent points in respect of the undertaking of Appropriate Assessment of high-level plans, and states the following,

"*…there are also certain particularities in the assessment of plans…. These particularities pertain to possible limitations and constraints and suitable approaches that can be used to overcome the difficulties and uncertainties linked with a lack of detailed information or insufficient definition of all the elements, components and actions of the plan.*

The level of detail of the plan itself will determine the scope and extent of the appropriate assessment, but in all cases the assessment must aim to identify sensitive or vulnerable areas or other potential risks or conflicts with Natura 2000 sites so that these can be taken into account at later stages in the planning process.

The assessment should be proportionate to the geographical scope, to the plan's level of detail and to the nature and extent of the likely effects. In some cases, it may not be possible to analyse in detail all the possible impacts on individual sites at this stage."

It is further stated that the requirements of a plan-level appropriate assessment are as follows:

- To identify the main potential impacts to the European Site network;
- To Identify possible broad mitigation measures; and
- To identify potential alternatives; and
- To identify potential cumulative impacts.

It is further stated that,

"*For strategic plans where it is not possible to identify effects on individual sites, the analysis should as a minimum focus on potential impacts and major risks; site-specific effects will then need to be analysed at project level. In such cases, the appropriate assessment should focus at least on determining the Natura 2000 sites that could be adversely affected as well as any EU protected habitats and species that could be affected (also outside Natura 2000), effects on connectivity, fragmentation and other effects at the network scale. This should serve to orientate the scope and focus of the assessment of individual projects*."

2.3 Information Sources Consulted

The following general sources of information have been consulted for background environmental information.

- Information provided by SONI for the NITDP
- Northern Ireland Environment Agency – online European Site information www.daera-ni.gov.uk;
- National Parks and Wildlife Service – online European site information www.npws.ie;
- UK Article 17 Reports, 2019, JNCC. Article 17 Habitats Directive Report 2019 (Habitats) | JNCC - Adviser to Government on Nature Conservation;
- UK Article 12 Report, 2019, JNCC. Eleventh Article 12 UK Birds Directive Report (2019): Annex A – General Report | JNCC Resource Hub;
- Ireland's most recent Article 17 Reports 2019, National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht www.npws.ie/publications/article-17-reports;
- Ireland's Article 12 submission to the EU Commission on the *Status and Trends of Bird Species (2008-2012)*;
- Geological Survey of Ireland (GSI) – geology, soils and hydrogeology www.gsi.ie;

- Environmental Protection Agency (EPA) – EPA Maps https://gis.epa.ie/EPAMaps/;
- CORINE (Co-Ordinated Information on the Environment) data series was established by the European Community (EC) www.epa.ie/soilandbiodiversity/soils/land/corine/;
- Information on river basin districts / catchments – https://www.catchments.ie/;

3 THE TRANSMISSION DEVELOPMENT PLAN FOR NORTHERN IRELAND 2023-2032

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 for Northern Ireland (TDPNI) 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 2022-2031 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 (2023-2032).

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 split into two planning areas the North and west and the South-east which best reflect the conditions and power flows on the transmission network. The distribution system operates at lower voltages of between 33kV and 230V and distributes electricity to customers' homes and business premises.

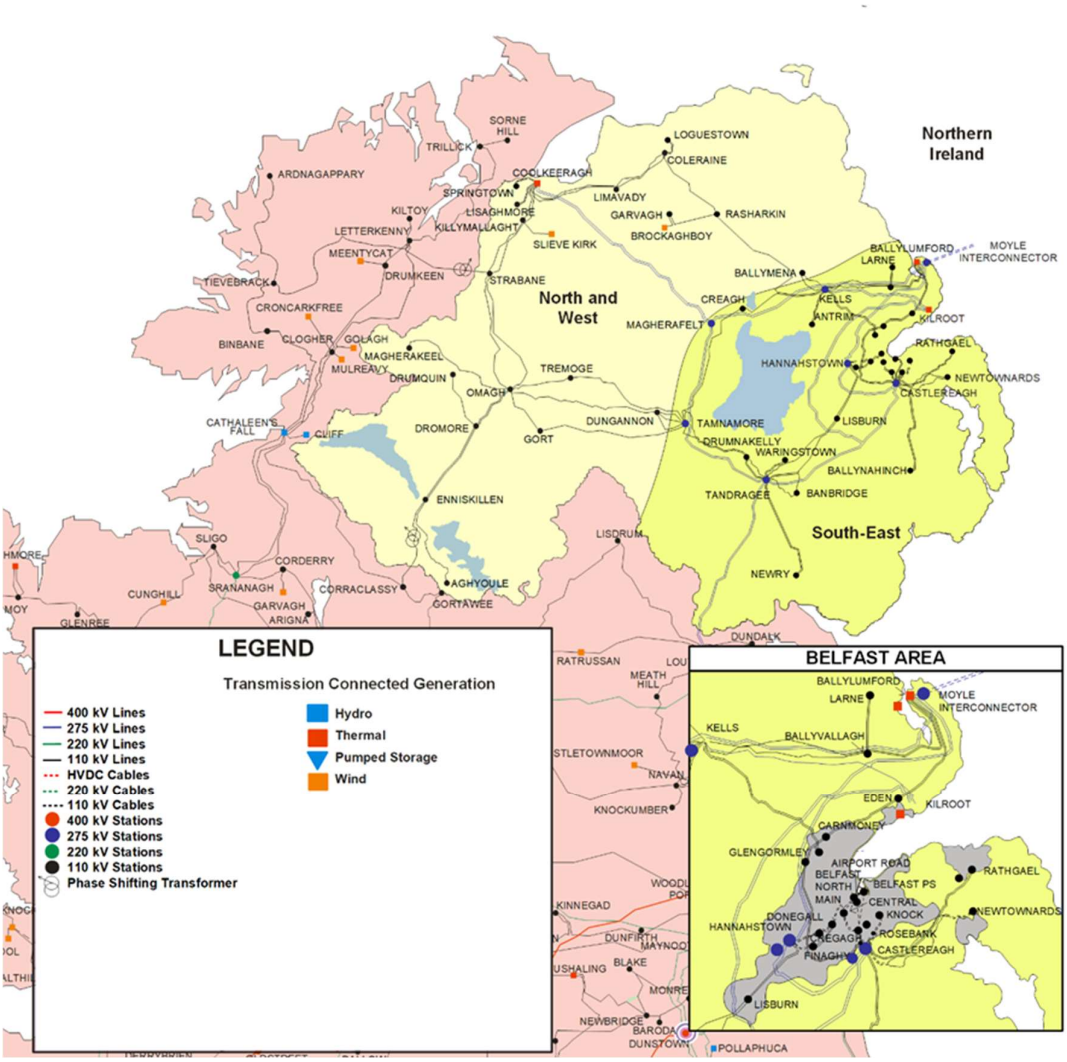


Figure 3.1: Illustration of the Northern Ireland planning areas

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.

ENVP5: To go beyond nature protection and seek funding, or other mechanisms to deliver site-specific, measurable and lasting biodiversity restoration and enhancement on suitable projects to fulfil the 'Biodiversity Duty' attaching by law to public authorities in Northern Ireland.

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.

ENVO2: To regularly monitor, document, and report specific actions taken for biodiversity restoration and enhancement under ENVP5.

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 2023-2032

3.3.1 Introduction

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

Table 3.1: Proposed Elements of the TDPNI to be Assessed

Section	Topic	Assessed in the HRA
1	**Introduction**	**No** – This is an introduction to the TDPNI
2	**Strategy for Developing the Grid** • Describes SONI's approach to grid development	**No** – This is a description of the approach to grid development.
3	**General Approach to Developing the Grid** • Describes SONI's approach to scenario planning, planning standards, the Framework for Developing the Grid, and public planning and environmental considerations	**No** – This is a description of the approach to planning for grid development.
4	**Implementation** • Describes SONI's approach to the environment, project development, planning and consenting of projects, and consultation and engagement	**No** – This is a description of the approach to implementing future transmission projects.
5	**Investment Needs** • Describes the policy and technical drivers of network development	**No** – This is a description of the drivers for grid development.
6	**Planned Network Developments** • An overview of planned NI transmission projects	**Yes** – This outlines the potential upcoming transmission projects.
7	**Project Descriptions** • Descriptions of individual projects	**Yes** – This describes the potential upcoming transmission projects.
8	**Summary of Strategic Environmental Assessment** • Included mitigation and monitoring proposals.	**No** – 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 3.1** 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 2023-2032. 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 2023-2032 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 2032, which are summarised in **Table 3.3**. 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

3.4.1 Changes since TDPNI 2021-2030

A total of 78 planned projects are included in this development plan (refer **Table 3.3**). Of these, 41 are NIE Networks asset replacement projects and 37 are network development projects. Since publication of the first TDPNI 2021-2030:

- 5 new projects have been included
  - Cam Cluster Substation;
  - Coolkeeragh – Limavady – Coleraine 110 kV Uprate;
  - Larne Transformer Replacement;
  - Limavady Transformer Replacement; and
  - North Sperrin Generation Substation.
- 5 projects have been cancelled;
- 3 projects have been renamed, had a change in scope, or been incorporated into other project scopes; and
- 2 project has been completed.

These changes are summarised in **Table 3.2**.

Table 3.2: Project changes since TDPNI 2021-2030

Project	Changes
Rasharkin 2nd 110/33 kV Transformer	Cancelled
North West Voltage Support	Cancelled
Omagh Main – Dromore Third Circuit	Cancelled
Enhancement to the low frequency load disconnection scheme	Cancelled
22 kV Switchgear Uprates	Cancelled
North West & Mid Tyrone Large-Scale Reinforcement	Renamed Mid Tyrone Reinforcement and scope changed
Castlereagh – Hannahstown 110 kV Reinforcement	Renamed Energising Belfast
Moyle 275 kV Reinforcement	Renamed Moyle Interconnector Capacity Increase
Cam Cluster Substation	New project
Coolkeeragh – Limavady – Coleraine Uprate	New project
North Sperrin Generation Substation	New project
Larne Transformer	New project
Limavady Transformer Replacement	New project
Castlereagh – Knock 110 kV Cables Uprate	Complete
Garvagh Cluster Substation	Complete

Table 3.3: Proposed project to be developed within TDPNI 2023-2032

Project	Description
Asset Replacement Projects	
Ballylumford - Eden 110 kV Circuit Uprate	The conductor on the existing tower line as well as a number of towers and foundations will be replaced due to the condition and age of the existing assets. The conductor will also be uprated to cater for increased demand. Estimated completion: 2023
Ballylumford Switchgear Replacement (T501)	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. The need for this project arises from the age, condition and obsolescence of the existing equipment as well as the need for a higher short circuit rating. Completion date: 2027
Coolkeeragh - Magherafelt 275 kV Circuits Refurbishment (T502)	The need for this project arises from the condition and rating of the existing conductor on the double circuit tower line, originally installed in the 1960s. Under certain scenarios there is a risk of overloading the existing conductor. The rating of the replacement conductor will be increased to cater for increased generation and will be defined as part of the redesign of the circuit. Completion date: Autumn 2023
Enniskillen Main Transformer 1 and 2 Replacement (T14)	The 110/33 kV transformers TX 1 and 2 are to be replaced due to the condition of the assets. Completion date: 2024
Glengormley Main Transformer Tx B Replacement (T14)	The 110/33 kV transformer Tx B is to be replaced due to the condition of the asset. The substation is also being refurbished and rebuilt Completion date: 2025
Hannahstown Shunt Reactor Replacement	One shunt reactor at Hannahstown is due to be replaced due to the failure of a previous device. Completion date: 2025
Hannahstown Inter-Bus Transformer 1 Replacement (T13)	The 275/110 kV 240 MVA interbus transformer IBTx 1 at Hannahstown is to be replaced due to asset age. A shunt reactor will also be installed on the new transformer. Completion date: 2025
Hannahstown 275 kV Structures, Busbars and Disconnectors Replacement	The 275 kV structures, busbars and disconnectors at Hannahstown are to be replaced due to the age and condition of the existing assets. Completion date: 2024

Project	Description
Tandragee Shunt Reactor Replacement (T15)	Tandragee TR2 shunt reactor is to be replaced due to the age and condition of the existing assets. Completion date: by 2025
Kilroot 275 kV CT Replacement Phase 1 (T11p)	The Current Transformers (CTs) on the 275 kV circuits at Kilroot are to be replaced due to the condition of the existing assets. Completion date: by 2025
Strabane Main 110 kV Refurbishment (T10)	The 110 kV mesh at Strabane Main is to be refurbished due to the condition of the existing assets. Completion date: 2023
RP6 275 kV Tower Maintenance (T17)	This project includes maintenance of 275 kV towers and condition assessment of towers and foundations. Completion date: Before 2025
RP6 110 kV Tower and Overhead Line Maintenance (T19)	This project includes conductor replacement on the Castlereagh – Rosebank and Donegall – Finaghy 110 kV circuits, as well as wood pole replacement, tower maintenance and tower and foundation condition assessments elsewhere. Completion date: Before 2025
RP6 110 kV Cable Maintenance (T20)	This project includes 110 kV cable refurbishment, cable flushing and maintenance of ancillaries. Completion date: Before 2025
RP6 110 kV Transmission Protection (T602)	This project includes replacement, maintenance and upgrading of protection at 110 kV substations. Completion date: Before 2025
RP6 275 kV Transmission Protection (T602)	This project includes replacement, maintenance and upgrading of protection at 275 kV substations. Completion date: Before 2025
RP6 22 kV Transmission Protection (T602)	This project includes replacement, maintenance and upgrading of protection relating to 22 kV connected reactors at 275/110 kV stations. Completion date: Before 2025
Miscellaneous RP6 Works (T11a-T11n, T11r, T12d-T12q, T12s, T16, T40)	This includes a number of small, within-station works including asbestos removal, concrete refurbishment, transformer bunding, auxiliary transformer replacement, transformer cooler replacement, 33 kV earthing transformer replacement, bushing replacement, station electrical systems, civil works, painting, earthing transformer replacement, transformer cooler replacement, security upgrades, health and safety upgrades, and provision of spares. This work is to be completed within the RP6 period and thus should be completed by 2025
Castlereagh – Rosebank Tower Line Removal	Following an assessment by SONI that the Castlereagh – Rosebank 110 kV tower line is no longer needed, the line is to removed and the existing communications link on the line replaced. Completion date: after 2025
Banbridge Main Transformer 1, 2, 3 and 4 Replacement	The 110/33kV transformers Tx 1-4 at Banbridge Main are to be replaced due to the age and condition of the existing transformers

Project	Description
Ballylumford 275 kV CVT Replacement	6 CVTs at Ballylumford 275 kV substation are to be replaced during RP7.
Castlereagh Interbus Transformer 1 Replacement	The 275/110 kV 240 MVA interbus transformer IBTx 1 at Castlereagh is to be replaced due to the condition of the asset.
Castlereagh Inter-Bus Transformer 3 Replacement	The 275/110 kV 240 MVA interbus transformer IBTx 3 at Castlereagh is to be replaced due to the age and condition of the existing transformer.
Cregagh Refurbishment	This project involves replacement of the existing 110/33/6.6 kV transformers at Cregagh with 110/33 kV and 33/6.6 kV units. It will also involve realignment of the transformers to ensure sufficient clearances
Donegall Main (North) Transformer Replacement	The 60 MVA transformer Tx B at Donegall North is to be replaced by a new 90 MVA unit. The need for this arises because of the condition of the asset. The rating of 90 MVA is the standard rating now procured for 110/33 kV transformer applications.
Dungannon Main Tx1 Replacement	The 90 MVA transformer Tx 1 at Dungannon is to be replaced by a new 90 MVA unit. The need for this arises because of the condition of the asset.
Hannahstown 110 kV Pantograph and CT Replacement	A number of 110 kV pantographs and CTs are to be replaced at Hannahstown due to asset condition
Kells Shunt Reactor Replacement	Two shunt reactors at Kells are due to be replaced due to the condition and age of the existing assets.
Kilroot 275 kV CT Replacement Phase 2 (T11p)	The Current Transformers (CTs) on the 275 kV circuits at Kilroot are to be replaced due to the condition of the existing assets.
Kilroot CVT Replacement	18 CVTs (275 kV) at Kilroot substation are to be replaced during RP7.
Loguestown Transformer 1 and 2 Replacement	Both 110/33 kV transformers at Loguestown Main are to be replaced. This work will include installation of new 110 kV structures, disconnectors and earth switches.
Noise Enclosures	Noise enclosures are to be installed on transformers at Eden, Lisburn and Newry. This will reduce the ambient noise from transformer operation.
Rathgael 110 kV Structures Replacement	The 110 kV structures at Rathgael are to be replaced due to the condition of the existing assets.
Standby Generators	60 kVA standby generators are to be installed at 18 transmission substations to provide resilience.
Tandragee Inter-bus Transformer Replacement	Both of the 275/110 kV transformers at Tandragee are to be replaced during RP7 due to the age and condition of the transformers.
RP7 275 kV Tower and Overhead Line Maintenance	This project includes maintenance of 275 kV towers and lines and condition assessment of towers and foundations

Project	Description
RP7 110 kV Tower and Overhead Line Maintenance	This project includes conductor replacement on some 110 kV spans, wood pole replacement, tower maintenance and tower and foundation condition assessments.
RP7 110 kV Cable Refurbishment	This project includes 110 kV cable refurbishment, cable flushing and refurbishment of ancillaries
RP7 110 kV Transmission Protection	This project includes replacement and upgrading of protection at 110 kV substations.
RP7 275 kV Transmission Protection	This project includes replacement and upgrading of protection at 275 kV substations.
Miscellaneous RP7 Works	This includes a number of small, within-station works including station electrical station upgrades, transformer cooler replacement, transformer bushing replacement, refurbishment of earthing systems, health and safety upgrades, security works, flooding works, transformer bunding, civil works, and provision of spares. This work is to be completed within the RP7 period.
Renewable Generation Cluster Substations and New Connections	
Cam Cluster Substation (NEW)	Under NIE Networks' cluster methodology[1], a generation cluster has been designated between Limavady and Coleraine in the Cam area. This will be connected to the 110 kV circuit between Coolkeeragh and Limavady. As a cluster substation this work is chargeable to the connecting generators, however, to enable future transmission network development in this area SONI are progressing a System Operator Preferred (SOP) solution which will additionally turn in the Coleraine – Limavady 110 kV circuit. The SOP element of this project is estimated to cost £5.2m. Estimated completion: 2029
Kells 110/33 kV Cluster	It is planned to establish a 110/33 kV cluster substation at the existing Kells 275/110 kV substation to connect new renewable generation to the transmission system. This will be connected to the existing Kells 110 kV station via an underground cable. As a cluster substation, this is funded by the connecting generators and there is no cost to the NI consumer. Estimated completion: 2025
Renewable Integration Developments	
Coolkeeragh 110 kV Extension	This project will involve provision of additional 110 kV bays at Coolkeeragh through a busbar extension in order to enable further connections and improve security of supply. The estimated project cost has reduced to £12.2 million due to a better understanding of necessary land remediation works.

[1] https://www.nienetworks.co.uk/connections/generation-connections/small-large-scale/clusters

Project	Description
	Estimated completion: 2029
Coolkeeragh – Killymallaght – Strabane 110 kV Uprate	As a result of increasing growth in renewable generation in the northwest of NI there will be a need to uprate the 110 kV circuits between Coolkeeragh, Killymallaght and Strabane with a higher capacity conductor. Project prioritisation and outage assessment has pushed the estimated completion date of this project to 2031. The estimated cost of this project is £19.98m. Previous estimated completion: 2027 New estimated completion: 2031
Coolkeeragh – Limavady – Coleraine 110 kV Uprate (NEW)	As a result of increasing growth in renewable generation in the northwest of NI there will be a need to uprate the 110 kV circuits between Coolkeeragh, Limavady and Coleraine with a higher capacity conductor. The estimated cost of this project is £15.1m. Estimated completion: 2027
Limavady Transformer Replacement (NEW)	The capacity of the existing 110/33 kV transformers at Limavady is insufficient for further connection of renewable generation to the Limavady distribution system. There is new generation planned in this area and therefore there is a need to replace the existing transformers at Limavady with higher capacity units. This project is expected to cost £3m. Estimated completion: 2026
Gort 110/33 kV 2nd Transformer	A reduction in local demand and increase in small scale generation on the distribution system connected to Omagh Main means that there is a risk of overload from a wind farm connected to this system. This project will involve the installation of a second 110/33 kV transformer at Gort to allow the transfer of a nearby wind farm to Gort from Omagh. This would address the transformer capacity issue currently at Omagh. The estimated cost of this project is £1.41 million. Estimated completion: Summer 2024
Mid-Antrim Upgrade	The drivers of this project are security of supply and RES integration. As a result of increasing growth in renewable generation there is a need to increase grid capacity south of Rasharkin 110/33 kV cluster substation. The estimated cost of this project has increased to £30.57 million due to inflation and an improved understanding of costs arising from project progress. An outage and deliverability assessment with NIE Networks has found that this project is likely to now conclude in 2029. Previous estimated completion: 2028 New estimated completion: 2029
North Sperrin Generation Substation (NEW)	There are increasing numbers of renewable generators connecting in the North Sperrin area, as well as older wind farms replacing older turbines with new, higher power units. However, there is a lack of strong connection points in this area, and existing transmission infrastructure in the North West is heavily loaded. Provision of a new transmission substation has the potential to provide an efficient means of connecting future generation and reconfiguring existing generation to reduce constraints. This is a joint transmission/distribution project to optimise

Project	Description
	the connection of generation and this area. This is estimated to cost £64m. Estimated completion: 2030 (transmission works – reconfiguration of distribution-connected windfarms is expected to continue after this date)
North West of NI 110 kV reinforcement	The drivers for this project are security of supply and RES integration. As a result of increasing growth in renewable generation in the northwest and potential for voltage instability there will be a need to reinforce the 110 kV transmission system near Rasharkin, Coleraine, Limavady and Garvagh cluster. As well as likely uprating of the circuits from Coolkeeragh to Limavady, the new circuit options to be investigated as part of this project will include: 110 kV circuit from Cam cluster – Rasharkin; and 2nd 110 kV circuit from Coleraine – Rasharkin. The estimated cost of this project is £33.6m. Previous estimated completion: 2029 New estimated completion: 2030
Mid Tyrone Project	Due to the increase in the renewable generation in the north and west there is a need to reduce congestion on the grid between Dromore, Omagh and Tamnamore. The preliminary preferred option for this project is to extend Tamnamore substation and construct a new 110 kV circuit from Dromore to Tamnamore. The estimated cost of this project has decreased from £67.24 million to £44m due to selection of the preferred option. Estimated completion date: 2030
Omagh Main – Dromore Uprate	With the connection of Drumquin cluster substation to Dromore it is necessary to restring the Omagh Main – Dromore tower line with higher capacity conductor. The cost of this project has increased to £5.4 million. Estimated completion: Summer 2023
Strabane – Omagh 110 kV Uprate	With increasing generation in the North West there is a risk of overload of the 110 kV circuits between Strabane and Omagh. This project will involve replacement of the conductor on the existing overhead lines with new conductor of a higher rating. The completion date has been changed after an appraisal of future outage availability. The estimated cost of this project is £12m. Previous estimated completion: 2028 New estimated completion: 2031
Ballylumford – Ballyvallagh 110 kV Uprate (NEW)	The existing 110 kV circuits between Ballylumford and Ballyvallagh are to be uprated due to increased flows relating to new renewable connections. This project is expected to cost £8.3m. Estimated completion: 2030

Project	Description
Larne Transformer Replacement (NEW)	The capacity of the existing 110/33 kV transformers at Larne is insufficient for further connection of renewable generation to the Larne distribution system. There is new generation planned in this area and therefore there is a need to replace the existing transformers at Larne with higher capacity units. This project is expected to cost £3m. Estimated completion: 2026
Tamnamore – Drumnakelly 110 kV Uprate	These circuits may be subject to overload under high wind generation conditions and are consequently switched out during high wind periods. This project is to upgrade the capacity on these circuits, allowing these circuits to fully return to service. The estimated cost of this project increased from £9 million to £22.5 million due to a better understanding of the scope of the project and increased use of cable. Estimated completion: 2027
Load Related and Security of Supply	
Coolkeeragh T1 Transformer Cabling Uprate	The increase in wind generation in the north-west of NI has resulted in an increase in power flows at Coolkeeragh. The project is to uprate the 110 kV cabling associated with Transformer 1 in order to accommodate these flows. The estimated cost of this project is £0.6 million. This project has been delayed due to prioritisation of other projects. Previous completion: Winter 2024 New estimated completion: 2026
East Tyrone Reinforcement Project	NIE Networks and SONI are jointly assessing the level of security of supply on the distribution system supplying Cookstown and the 110/33 kV substation at Dungannon. It is forecast that demand will exceed capacity at the existing Dungannon 110/33 kV substation. In addition, there is a particular risk to supplies following a second circuit outage. The preliminary preferred option for this project is to extend Dungannon substation and install an additional two 110/33 kV transformers. The estimated cost of this project is £7.9m. The estimated completion date of this project has changed following selection of the preferred option and assessment of the works required. Previous estimated completion: 2024 New estimated completion: 2027
North West Special Protection Scheme Upgrade	This scheme was installed to protect the network in the north-west in the event of faults on the 275 kV network before the large-scale installation of wind generation in the north and west of NI. As wind generation capacity has increased, a need has been identified to replace and upgrade the existing special protection scheme. The estimated cost of this project is £0.3 million. Estimated completion: Summer 2023
New North West 110kV switching station	The capacity in the 110 kV circuit in the northwest is low and the network configuration immediately south of Coolkeeragh is sub-optimal. There is a lack of additional bays at Coolkeeragh substation for future connections.

Project	Description
	This project will establish a new 110 kV switching station near Mobuoy and rationalise the 110 kV network in the area. The estimated cost of this project is £33.9 million. Estimated completion: >2032
Coolkeeragh 275 kV Redevelopment	A number of concrete structures at Coolkeeragh are not compliant with modern standards and are in need of replacement. Additionally, there is a need to install a 2nd bus coupling circuit breaker. This project will address this issue through redevelopment of the existing substation or replacement. The estimated cost of this project is £18.2 million. The estimated completion of this project has been delayed following assessment of outage availability and project prioritisation. Previous estimated completion: 2029 New Estimated completion: 2031
Energising Belfast	The existing conductor on the Castlereagh – Carnmoney 110 kV double circuit is due for replacement due to the condition of the assets. This project will install a 4th interbus transformer at Castlereagh and establish a 110 kV cable connection between Hannahstown and Castlereagh substations through Belfast city centre. This will enable removal of the existing 110 kV double circuit between Carnmoney and Castlereagh. This will be a phased project and that elements will be completed before the final completion of the project. The estimated cost of this project is £45.5m. Estimated completion: 2028
Carnmoney – Eden Reinforcement	The existing tower line between Carnmoney and Eden is due for refurbishment or replacement. This project will refurbish the rural portion of this tower line and replace the urban portions with underground cable. A 2nd 110/33 kV transformer will also be installed at Glengormley Main substation. The estimated cost of this project has increased to £31 million after the project scope was revised to include increased use of underground cable. The estimated completion date of this project has changed due to the change in scope and reprioritisation of projects. Estimated completion: 2028
Airport Road 110/33 kV substation	A new 110/33 kV substation will be constructed in the Belfast Harbour Estate, close to the existing Airport Road 33/6.6 kV substation. The substation will be connected to the existing Rosebank substation via the existing 110 kV tower line (currently operated at 33 kV) from Rosebank to Sydenham Road. The need for this project arises from the increasing load in the Belfast Harbour and city centre area. Planning permission has been received for this substation. The estimated cost of this project is £6.7 million. This project has been delayed due to negotiations to secure the required land. Estimated completion: 2026
Armagh and Drumnakelly Reinforcement	There is a need to reinforce the distribution system supplying Armagh city and the surrounding area due to increasing demand. It is also forecast that demand will exceed capacity at the existing Drumnakelly 110/33 kV substation. The preferred option for this project is to establish a new 110/33 kV substation at Armagh with new 110 kV circuits from Tandragee.

Project	Description
	The estimated cost of this project is £27.1 million. Estimated completion: 2029
Newry Reinforcement	The demand at Newry is forecast to approach the capacity of the substation in the next ten years. This project will investigate transmission and distribution options to provide more capacity on this part of the network. A shortlist of options has not yet been developed, but the indicative cost of this project is £29.3 million. Estimated completion: 2030
Shunt Reactors - Castlereagh, Tandragee and Tamnamore	In order to manage voltages on the transmission system at periods of low demand, further shunt reactors are planned to be installed at Castlereagh, Tandragee and Tamnamore substations in order to improve voltage regulation when the network is lightly loaded. The reactors for this project will be installed in phases with the first one connected in 2023. The estimated cost of this project is £6.3m. The reactors will be installed in phases starting in 2023. Final completion has been delayed as several of the initially procured reactors are required to replace existing units which have failed in service, meaning that further units will be needed to complete the programme. New estimated completion: 2028
Fault Level Replacements	
Castlereagh 110 kV Switchgear Replacement	Due to increasing fault levels it is planned to replace 110 kV circuit breakers and current transformers at Castlereagh. The estimated cost of this project is £3.1 million. The estimated completion of this project has been revised after assessment of the phasing and availability of outages. Estimated completion: 2027
Tandragee 110 kV Switchgear Replacement	Due to increasing fault levels it is planned to replace 110 kV circuit breakers and current transformers at Tandragee. The estimated cost is £2.7 million. Estimated completion: 2027
Castlereagh 275 kV Redevelopment	A re-appraisal of the original design has found that the concrete structures at Magherafelt are not sufficient to meet modern design standards. This project will address this issue through redevelopment of the existing substation or replacement. The estimated cost is £24.6m, of which £15m is projected to be spent within the timeframe of this TDPNI. Estimated completion: 2033
Kells 275 kV Redevelopment	A re-appraisal of the original design has found that the concrete structures at Magherafelt are not sufficient to meet modern design standards. This project will address this issue through redevelopment of the existing substation or replacement. The estimated cost of this project is £24.6m. Estimated completion: 2031

Project	Description
Magherafelt 275 kV Redevelopment	A re-appraisal of the original design has found that the concrete structures at Magherafelt are not sufficient to meet modern design standards. This project will address this issue through redevelopment of the existing substation or replacement. The estimated cost of this project has increased to £24.6 million due to a better understanding of the necessary scope. Estimated completion: 2031
Tandragee 275 kV Redevelopment	A re-appraisal of the original design has found that the concrete structures at Magherafelt are not sufficient to meet modern design standards. This project will address this issue through redevelopment of the existing substation or replacement. The estimated cost of this project is £25.3 million, of which £8.1m is projected to be spent during the timeframe of this TDPNI. Estimated completion: 2038
Interconnection	
North-South Interconnector	This project involves construction of a new 400 kV circuit from existing Woodland 400 kV station in County Meath (Ireland) to a proposed 400/275 kV station at Turleenan in County Tyrone (Northern Ireland). This project is needed to remove constraints within the single electricity market, improve security of supply and facilitate safe and secure operation of the power system with high renewable penetration levels. The estimated cost for the Northern Ireland portion is £228.6 million. Estimated completion: 2026
Moyle Interconnector Capacity Increase	At present, full utilisation of the 500 MW export capability of the Moyle Interconnector is prevented by the potential for network overloads and voltage steps in the event of the loss of the 275 kV double circuit between the Moyle converter station at Ballycronan More and the nearby Ballylumford substation. This project involves works to allow reconfiguration of the connection to Moyle to address this contingency. The estimated completion has changed due to a better understanding of the procurement and planning needs of the project. The project cost is estimated at £9.5m. Estimated completion: 2028
Projects in both planning areas	
CVT Upgrade for Harmonic Measurement	It is planned to replace Capacitor Voltage Transformers (CVTs) at a number of sites with models capable of power quality monitoring, in order to improve monitoring of power system harmonics. The estimated cost of this project is £0.7 million. Estimated completion: 2024
Filter Tuning/Replacement (On hold)	With increasing use of cable on the transmission system as well as an increase in non-linear load and generation, harmonic levels on the transmission system are increasing. This project will analyse the requirement for harmonic filters and re-tune/augment these accordingly. This project is on hold pending results obtained from the planned

Project	Description
	new CVTs being installed (see project above) Estimated completion: TBD

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. A*ngle 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 3.4** summarises the various structure types utilised in the transmission network on the island of Ireland.

Table 3.4: Transmission Network Structures

Structure	Material & dimensions	Foundation	Spacing
400 kV	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.
275 kV	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.		
220 kV	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.
110 kV pole set	Wooden pole sets consisting of two wooden poles, 5m apart and connected near the top with a rolled steel channel.	A minimum of 2.3m of pole is buried underground; no concreting around the base of the poles is carried out	Span between 110 kV structures ranges between 180 and 300m, depending on local landscape

		under normal ground conditions.	features and topography.
	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 members. Three-pole intermediate pole sets may also be erected in certain cases, comprising a 5m spacing between poles.	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 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.	
110 kV angle mast	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:

- 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;
- Establishment of temporary access routes and laydown/storage areas where necessary;
- Setting out of tower foundations or pole excavations;
- Installation of foundations as appropriate;
- Erection of towers or pole sets;
- Stringing of conductors and commissioning;
- Reinstate land; and
- 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 turves 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 Uprating

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 uprated to increase capacity or strengthen electrical resilience in the system. Uprating 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 uprating of transmission lines can include some or all of the following:

- 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.

- Replacement of crossarm and fittings – this involves removal of crossarm and fittings, followed by installation of new crossarm and fittings (110 kV only).
- 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.
- 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.
- 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 (uprating).
- 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 uprate 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 3.5 outlines the types of structures and equipment typically used during the construction, uprating 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 riverbed 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, riverbed 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 3.5: Summary of works and resources involved in the construction, uprating and refurbishment of overhead line infrastructure

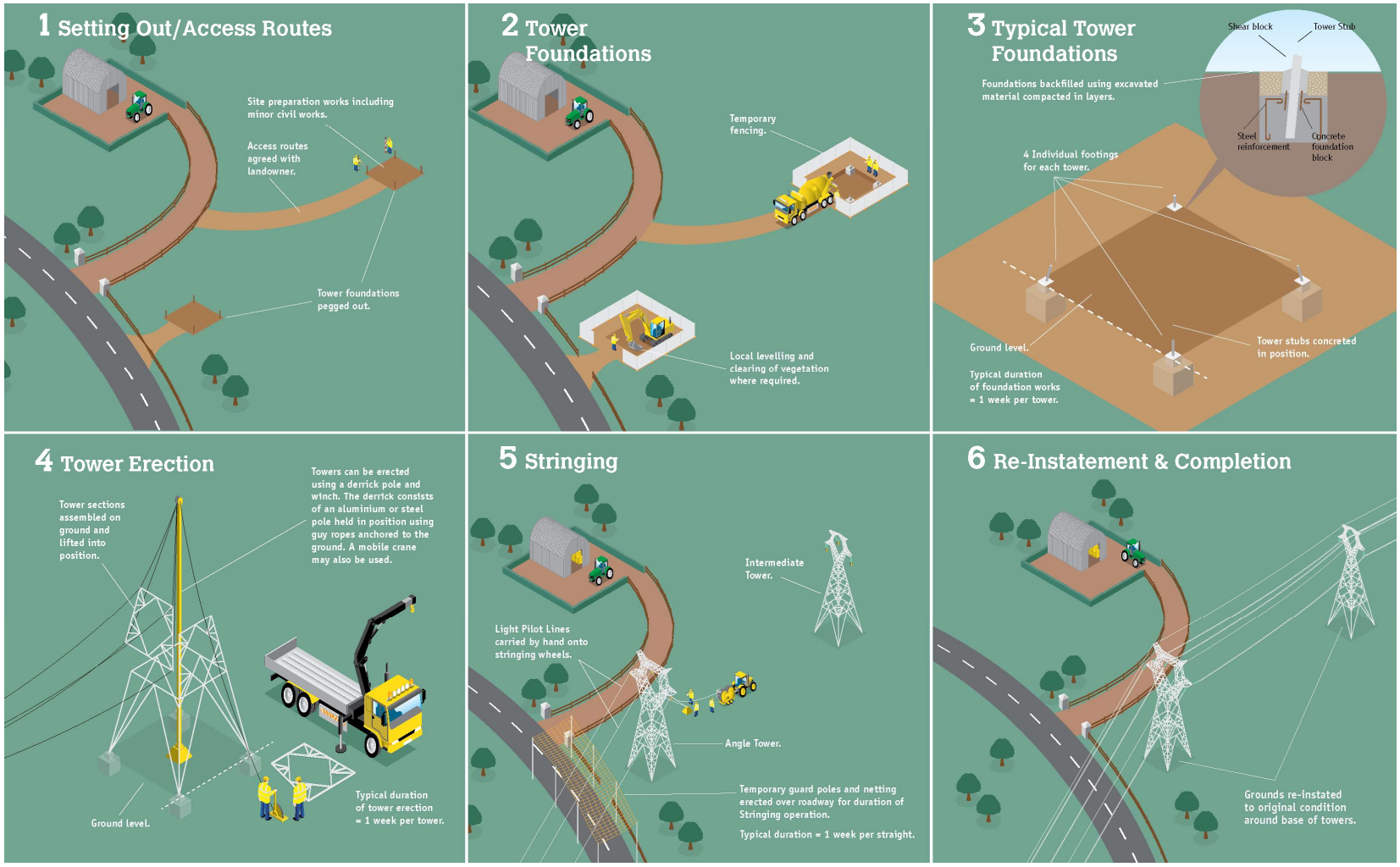
	Works	Summary	Plant required for construction
Construction	**275 kV tower construction**	Design: The height range of towers is generally between 20 m and 52 m depending on topography. The maximum width of the towers at ground level ranges from 7 m to 12 m. The average span between towers is on average approximately 350 m, dependent on local topography. 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. 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.	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
	220 kV tower construction	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. Foundation & 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.	As for 400 kV
	110 kV pole set construction	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. 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	Transit van Excavator Winch tractor/pole erector Chains and other small tools

	Works	Summary	Plant required for construction
		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.	
	110 kV pole set stays	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
	110 kV angle tower construction	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
Refurbishment / Uprating	**Replace fittings**	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
	Replace crossarm and fittings	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.
	Replace intermediate pole set structures	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	2 no. 360˚ tracked excavator Winch Tractor Quad bike

Works	Summary	Plant required for construction
	removed from site. Alternatively, the old poles may be fully removed from the ground with the new poles being installed in the same position.	
Replace angle mast structures	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
Replacing the conductor	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 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. Once the conductor is connected to the angle masts the temporary poles are then removed.	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
Access to works Areas	**Tower & pole set construction**	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. Bog mats, either of timber, aluminium or rubber construction are used to access structures in poor ground conditions or in ecologically sensitive areas. 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. Materials required for construction are transported around the site by general purpose cross country vehicles with a lifting device.	
	Refurbishment & uprating	Machinery access protocol as for construction above. 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.	

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_6) 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 bunded plinths comprising water pumps with oil sensors which deactivate pumping when oil is detected.

Ancillary wastewater 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 HABITATS REGULATIONS ASSESSMENT

Northern Ireland has obligations under UK and Domestic law to protect and conserve biodiversity. This relates to habitats and species both within and outside designated sites. Nationally, Ireland has developed a Biodiversity Strategy (DAERA 2015) to address issues and halt the loss of biodiversity, in line with national and international commitments. The overall vision in the Biodiversity Strategy is to halt biodiversity loss through engagement with a number of high-level challenges.

4.1 European Sites

In Northern Ireland SPAs and SACs are part of the UK National Site Network and formerly a part of the Natura 2000 network. They are referred to as UK National or European Sites, as per current DAERA guidance. In the Republic of Ireland, sites within the Natura 2000 Network are referred to as European sites and comprise SACs and SPAs. In both NI and RoI SACs are designated on account of the supported Qualifying interests (QIs) which are limited to habitats and species which are listed on Annex I and Annex II of the Habitats Directive respectively. SPAs however are concerned with the protection of specific Special Conservation Interests (SCIs) limited to populations of Annex I bird species and the associated habitats of importance for these populations.

In identifying the Zone of Influence (ZoI) for the appropriate assessment of the TDPNI, a number of considerations were taken into account, notably the national and strategic nature of the TDPNI; the relationship of listed qualifying interests of SACs and SPAs within NI and those in RoI which are understood to have connectivity with the sites in Northern Ireland.

The AA screening appraisal considered that since the TDPNI was a national programme that all the European Sites within Northern Ireland, in addition to those in Republic of Ireland within 15km of the border or lying downstream from proposed works in Northern Ireland were considered. For consistency, the ZoI for the Appropriate Assessment adopts the same approach.

Qualifying Interests of the European sites in Northern Ireland are listed in **Table 4.4**. Special Protection Areas (SPAs) in the zone of influence of the TDPNI are described in **Table 4.1**, and are illustrated in Figure 4.1. Special Areas of Conservation (SACs) in the zone of influence of the TDPNI are described in **Table 4.2** and are illustrated in Figure 4.2. Ramsar sites in the zone of influence of the TDPNI are described in **Table 4.3** and are illustrated in Figure 4.3.

4.1.1 Conservation Objectives

Site-specific conservation objectives (SSCO) aim to define favourable conservation condition for a particular habitat or species at a Natura 2000 site. Maintaining habitats and species in a favourable conservation condition then contributes to the wider objective to maintain those most vulnerable habitats and species at favourable status throughout their range within the Natura 2000 network.

At an individual site level, SSCO specify whether the objective is to maintain or to restore favourable conservation condition of the habitat or species, and they set out attributes and targets that define the objectives. It is the aim of the relevant departments in NI and RoI to produce SSCO for all European sites in due course. The SSCO for European Sites are set out to ensure that the qualifying features of that site are maintained or restored to a favourable conservation condition / conservation status.

A summary of the conservation objectives which have been set for each site is included at **Table 4.4**.

It is noted that the existing conservation condition of some habitats and species is unfavourable at present for various reasons, including because of exceedance in environmental quality parameters. This is discussed further in the next section.

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 78 no. potential projects that could be developed within the Plan period up to 2032, which are grouped into six general development types. **Table 4.5** summarises those potential projects for which an impact pathway can reasonably be anticipated. **Table 4.6** links the potential projects with European sites for which a Likely Significant Effect might arise as a result of the impact pathway.

As there are no marine projects proposed by the Plan and as there are no intended or reasonably foreseeable marine works, the potential impact pathway of underwater (subsea) noise capable of causing injury or disturbance to marine mammals is not considered further. As such, marine mammal qualifying interests of the Strangford Lough SAC, North Channel SAC, The Maidens SAC, Murlough SAC and Skerries and Causeway SAC are not considered further in the HRA.

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

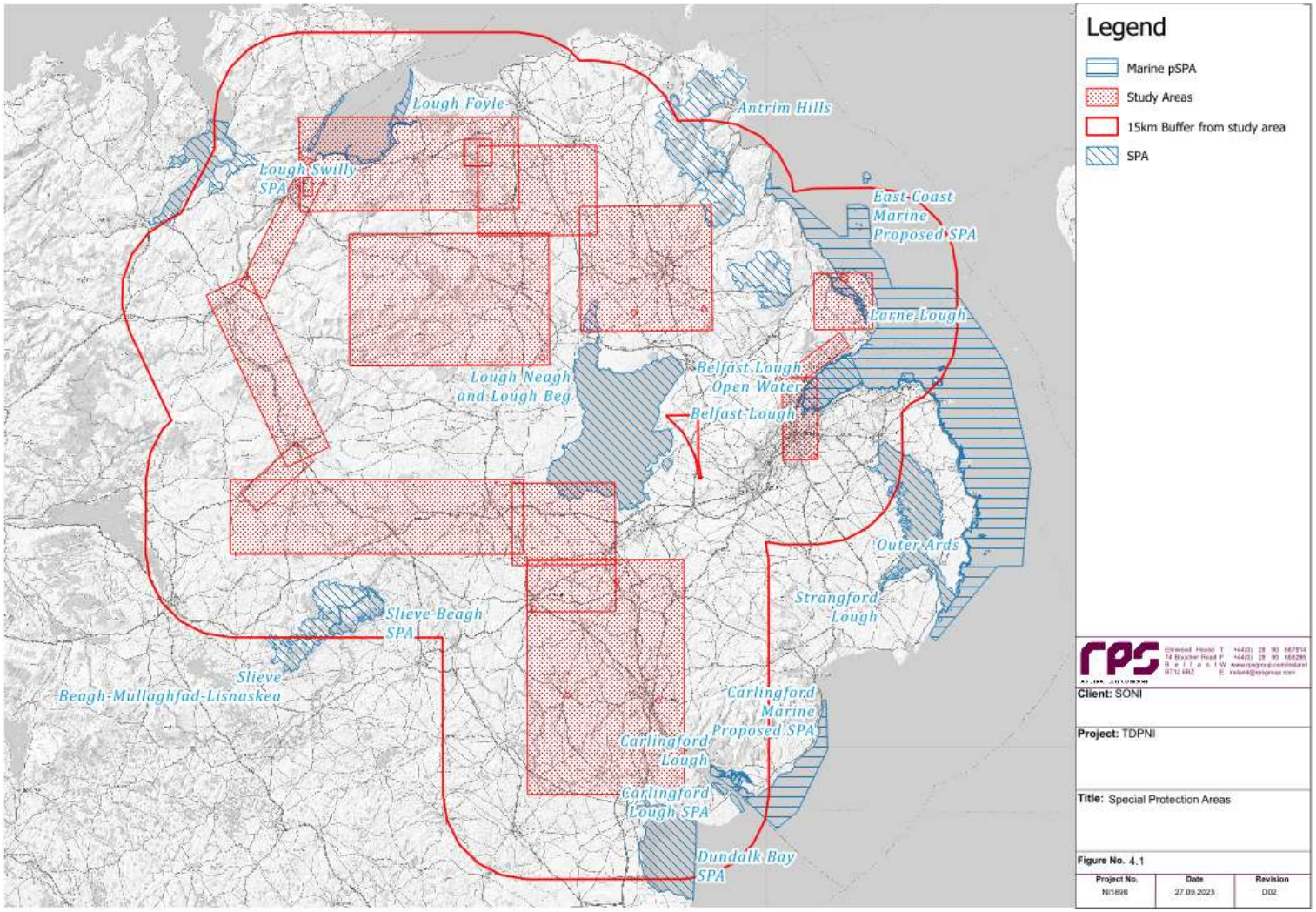


Table 4.1: List of Special Protection Areas within the 15 km ZoI

Site Code	Name
UK9020101	Belfast Lough
UK9020042	Larne Lough
UK9020091	Lough Neagh and Lough Beg
UK9020111	Strangford Lough
UK9020031	Lough Foyle
UK9020161	Carlingford Lough
UK9020271	Outer Ards
UK9020301	Antrim Hills
UK9020302	Slieve Beagh-Mullaghfad-Lisnaskea
UK9020290	Belfast Lough Open Water
UK9020291	Copeland Islands
IE004026	Dundalk Bay SPA
IE004075	Lough Swilly SPA
IE004078	Carlingford Lough SPA
IE004087	Lough Foyle SPA
IE004167	Slieve Beagh SPA

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

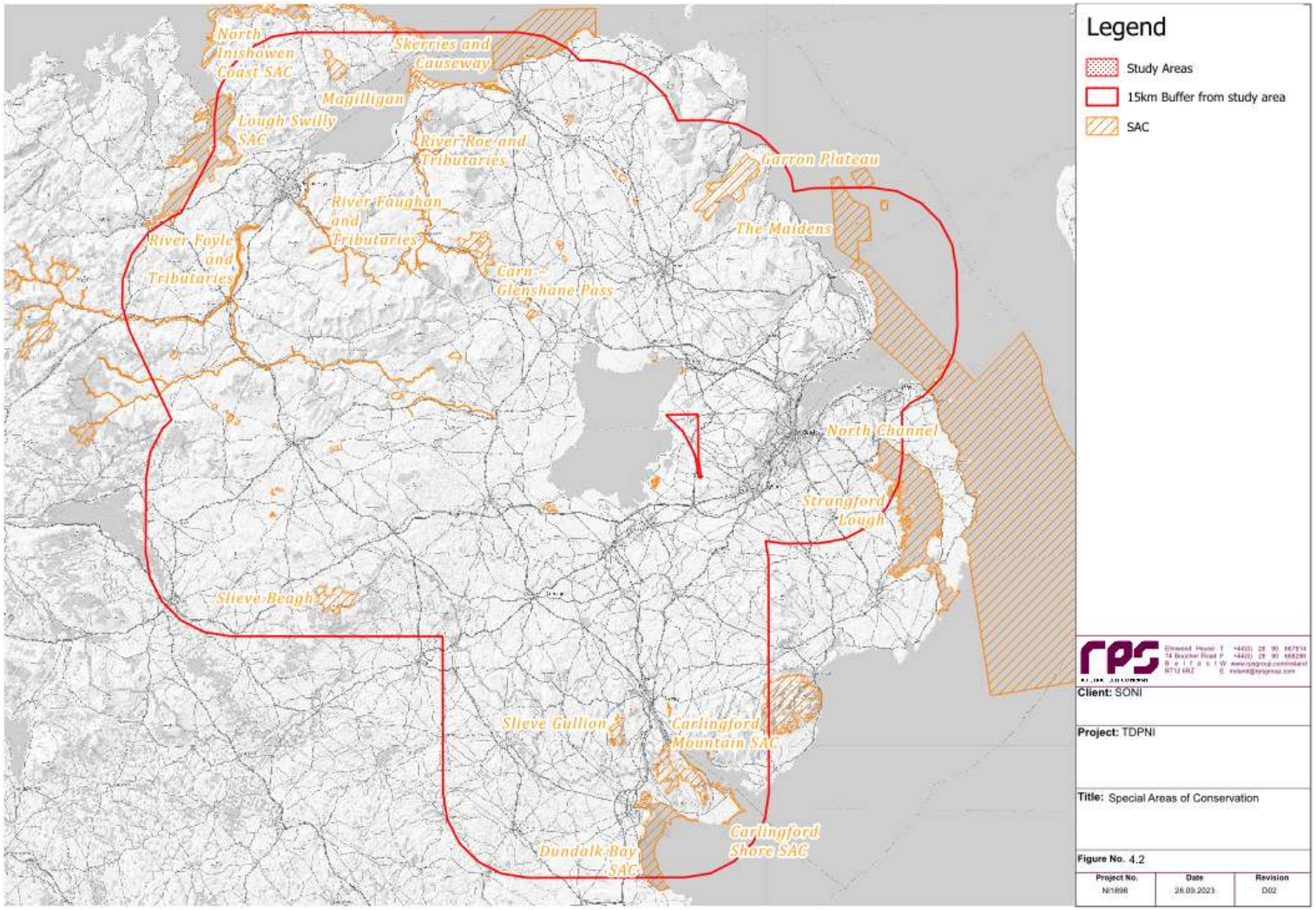


Table 4.2: List of Special Areas of Conservation within the 15 km ZoI

Site Code	Name
UK0030318	Aughnadarragh Lough
UK0016599	Ballynahone Bog
UK0030083	Banagher Glen
UK0030084	Bann Estuary
UK0030089	Binevenagh
UK0016609	Black Bog
UK0030110	Carn – Glenshane Pass
UK0030321	Cranny Bogs
UK0030322	Curran Bog
UK0030323	Dead Island Bog
UK0030324	Deroran Bog
UK0016620	Derryleckagh
UK0016615	Eastern Mournes
UK0016611	Fairy Water Bogs
UK0016606	Garron Plateau
UK0016610	Garry Bog
UK0016613	Magilligan
UK0030199	Main Valley Bogs
UK0030211	Moneygal Bog
UK0030214	Montiaghs Moss
UK0030399	North Channel
UK0030233	Owenkillew River
UK0030236	Peatlands Park
UK0030244	Rea`s Wood and Farr`s Bay
UK0030361	River Faughan and Tributaries
UK0030320	River Foyle and Tributaries
UK0030360	River Roe and Tributaries
UK0030268	Rostrevor Wood
UK0030383	Skerries and Causeway

UK0016622	Slieve Beagh
UK0030277	Slieve Gullion
UK0016618	Strangford Lough
UK0016608	Teal Lough
UK0030384	The Maidens
UK0030325	Tonnagh Beg Bog
UK0030326	Tully Bog
UK0030296	Upper Ballinderry River
UK0030303	Wolf Island Bog
IE002306	Carlingford Shore SAC
IE002287	Lough Swilly SAC
IE000455	Dundalk Bay SAC
IE000453	Carlingford Mountain SAC
IE000168	Magheradrumman Bog SAC
IE002012	North Inishowen Coast SAC
IE002301	River Finn SAC

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

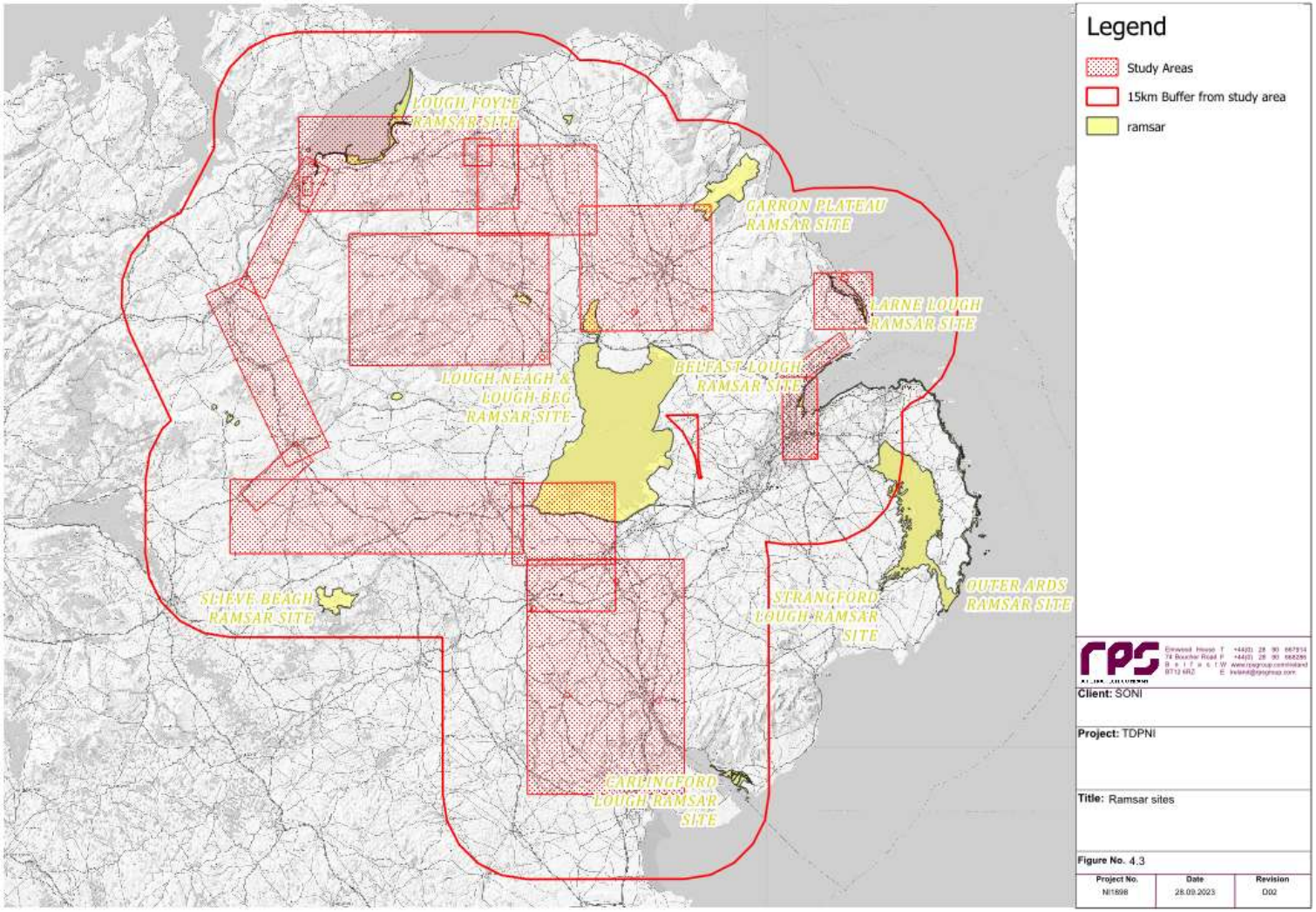


Table 4.3: List of Ramsar sites within the 15 km ZoI

Site Code	Name
UK12011	Garry Bog ramsar site
UK12014	Lough Foyle ramsar site
UK12010	Garron Plateau ramsar site
UK12001	Ballynahone bog ramsar site
UK12013	Larne Lough ramsar site
UK12003	Black Bog ramsar site
UK12002	Belfast Lough ramsar site
UK12008	Fairy Water Bogs ramsar site
UK12016	Lough Neagh & Lough Beg ramsar site
UK12021	Strangford Lough ramsar site
UK12020	Slieve Beagh ramsar site
UK12004	Carlingford Lough ramsar site
UK12018	Outer Ards ramsar site

4.3 Conservation Status of EU Protected Habitats and Species

Under the Habitats Directive, each Member State is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive. While this obligation no longer applies to Northern Ireland, the most recent Article 17 Report was published by the JNCC in 2019 (JNCC 2019) and as such provides the most recent summary of the conservation condition of the habitats and species which are qualifying features of SACs within Northern Ireland.

The 2019 Article 17 Report (DAERA 2019) identifies the conservation status of the qualifying Annex I habitats and Annex I species within SACs in Northern Ireland.

For the 2019 submission, the report recorded 2% of habitats as '*favourable'*, 20.4% as '*Unfavourable inadequate'*, 59.2% as '*Unfavourable Bad*' and 18.4% as '*Unknown*'. In regard to species, of the 28 species assessed (included non-qualifying species) 12 were considered to be at '*favourable*' conservation status, 3 at '*inadequate'* conservation status, 2 at '*bad'* conservation status and 11 '*unknown*'.

In the Republic of Ireland National Parks and Wildlife Service (NPWS) published an Article 17 report detailing the conservation status in Ireland of habitats and species listed in the EU Habitats Directive, in 2019.

For the 2019 submission, the Republic of Ireland's Article 17 Report recorded 15% of habitats as '*favourable'*, 46% as '*inadequate*' and 39% as '*bad*'. In regard to species 57% were assessed as '*favourable*', 15% as '*inadequate*', 15% as '*bad*' and 13% as '*unknown*' or considered to be vagrant species.

Among the key findings of both reports were:

- Many habitats are in unfavourable status. Many are still declining albeit with some positive actions underway while almost half are demonstrating ongoing declines;
- The main pressures to habitats are from grazing; pollution of watercourses; drainage / cutting of peatlands and wetlands; invasive species; recreation; [urbanisation; fertilizer application; and road building among others];
- Some of the coastal and marine habitats are considered to be improving, and to have better prospects, due in part to implementation of existing environmental legislation;
- The status of raised bogs in Ireland as a whole is '*bad*'; and the trend is for an ongoing decline as restoration is necessary to cause improvement.
- Grasslands, such as orchid-rich grasslands and hay meadows, have undergone significant losses over the last decade, with 31% and 28% of the area monitored reported as being lost.
- Blanket bog is also assessed as '*bad*'; the report notes that, as one of the main impacts on this habitat is grazing, impacts also occur through on-going deleterious effects such as peat cutting, erosion, drainage and burning;
- Although some of our woodlands are rated as '*bad*' because they are patchy and fragmented, improvements have been noted due to afforestation, the planting of native species, the removal of alien species and control of overgrazing.
- Many freshwater habitats are considered unfavourable due to nutrient loading within the catchment.
- Losses of limestone pavement has been recorded outside the SAC network, however the BurrenLIFE and Burren Farming for Conservation Programme have significantly improved the quality of pavement and its associated habitats.
- Otter, pine marten and many bat species have also been assessed as '*favourable*' with evidence of an expanding range;

- Salmon *Salmo salar* is showing signs of improvement, but some other fish remain at '*bad*' status; and
- Freshwater pearl mussel is '*bad*' and declining.

Similarly, the requirements for reporting under Article 12 of the Birds Directive (2009/147/EC) are every six years.

The Northern Ireland Article 12 submission is encapsulated within that of the wider UK. The most recent report submitted in 2019, covers 264 species which includes breeding, wintering and passage Annex I bird species. Significant long-term decreases have been recorded in a relatively large proportion of species including northern gannet *Morus bassanus,* common goldeneye *Bucephala clangula,* sandwich tern *Thallasseus scandvicensis* among a large number of others with some species showing minor increases.

The Republic of Ireland's Article 12 submission to the EU Commission on the *Status and trends of bird species (2008-2012)*[2] covers 196 species which includes breeding, wintering and passage species. The report details that some species have undergone significant declines in their long-term breeding population trend: corncrake *Crex crex,* curlew *Numenius arquata,* lapwing *Vanellus vanellus* and redshank *Tringa totanus*. The hen harrier *Circus cyaneus* shows a long-term population trend decrease. The results confirm that there is a need for measures to halt the declines noted above, most of which are due largely to changes in farming practices and intensity, and also the increase of activity in extensively farmed uplands through forests and wind farm construction.

The assessment and outlook is pessimistic overall. Biodiversity losses and habitat changes continue on an international scale. EU conservation status reporting indicates generally declining trends and unfavourable status for many habitats, with 85% having unfavourable status. Many species are faring better, but 15% are in decline at EU level, mostly freshwater species. Agricultural activities remain the key pressure. The outlook is very poor, with climate change adding to challenges and cumulative impacts.

The 2018 report, Sustainable Development in the European Union, warned of the worrying decline in nature globally, with species extinction rates accelerating. The UN stating that biodiversity is in crisis. In Ireland, the majority of the most ecologically important habitats are reported to be of inadequate or bad conservation status. Agricultural practices account for 70% of the negative impacts on habitats. Most species are considered to be stable however a number of key species are declining. Aquatic species and bees are reported to be most at risk. Pressures from changes to land use, intensification of agriculture, pollution and climate change, as well as the impacts of a growing economy, are likely to bring additional pressures on a number of species and habitats in Ireland. Based on the poor conservation status of many important habitats and some species, considerable efforts and resources will be required to improve their status, both within and outside protected areas.

It's likely that pressures due to climate change, agricultural system changes and invasive species will remain the same or increase unless action is undertaken.

4.4 Existing Threats and Pressures to EU Protected Habitats and Species

Under Article 17 of the Habitats Directive, Member States are obliged to identify threats and pressures to QIs/ SCIs using a standard set of criteria. A threat is defined as an '*Activity expected to have an impact on a species/habitat type in the future*' and a pressure is defined as an '*Activity impacting a species/habitat type during the reporting cycle*'. These identified threats and pressures are still documented for European sites within NI as they predate the withdrawal of the UK from the EU.

[2] http://ec.europa.eu/environment/nature/knowledge/rep_birds/index_en.htm (Accessed February 2021)

Threats and pressures considered to be most relevantly linked either directly or indirectly to the TDPNI were extracted from the full list of threats and pressures. The headline category considered relevant to the TDPNI is pollution, but the main list is presented below:

- Transportation and service corridors;
- Urbanisation, residential and commercial development;
- Mining, extraction of materials and energy production;
- Pollution;
- Natural System modifications;
- Natural biotic and abiotic processes (without catastrophes);
- Geological events, natural catastrophes; and
- Climate change.

Under Article 17 of the Habitats Directive, Member States are also obliged to identify threats and pressures to individual qualifying features using a standard set of criteria. Threats are defined as '*Factors expected to act in the future after the current reporting period*' within the '*current six-year reporting period*', and pressures are defined as '*Acting now and/or during (any part of or all of) the current reporting period*', within the '*future to reporting periods*.'[3]

4.4.1 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.

4.4.2 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

4.4.3 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.

[3] Reference Portal for reporting under the Article 17 of the Habitats Directive *Explanatory Notes & Guidelines for the period 2013-2018* http://cdr.eionet.europa.eu/help/habitats_art17. Accessed August 2021.

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 4.4: Conservation objectives and Qualifying Interests of European sites within the zone of influence of the TDPNI

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK0030083	Banagher Glen SAC	Conservation Objectives Specific Version 2.0 (01/04/15) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Northern Atlantic wet heaths with *Erica tetralix* *Tilio-Acerion* forests of slopes, screes and ravines Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [H91A0] Annex II Species Otter *Lutra lutra*
UK0030360	River Roe & Tributaries SAC	Conservation Objectives Specific Version 3.0 (27/07/17) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex II Species Atlantic Salmon *Salmo salar* Otter *Lutra lutra*
UK0030361	River Faughan & Tributaries SAC	Conservation Objectives Specific Version 3.0 (27/07/17) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex II Species Atlantic Salmon *Salmo salar* Otter *Lutra lutra*
UK0030084	Bann Estuary SAC	Consevation Objectives Specific Version 2.0 (01/04/15) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Fixed coastal dunes with herbaceous vegetation (grey dunes) Atlantic salt meadows (*Glauco – Puccinellietalia maritimae*) Embryonic shifting dunes Shifting dunes along the shoreline with Ammophila arenaria (white dunes)
UK0016606	Garron Plateau SAC	Conservation Objectives Specific Version 2.1 (12/10/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Blanket bogs (*if active bog) Alkaline fens Oligotrophic to mesotrophic standing water with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea Natural dystrophic lakes and ponds Northern Atlantic wet heaths with Erica tetralix Transition mires and quaking bogs Annex II Species Marsh saxifrage *Saxifraga hirculus*
UK0030365	Red Bay SAC	Conservation Objectives Specific Version 2.0 (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Sandbanks which are slightly covered by sea water all the time
UK0030097	Breen Wood SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Bog woodland
UK0030384	The Maidens SAC	Conservation Objectives Specific Version 2.0 (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Reefs Sandbanks which are slightly covered by sea water all the time Annex II Species Grey seal *Halichoerus grypus*
UK0030321	Cranny Bogs SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats Active raised bogs
IE002287	Lough Swilly SAC	Conservation Objectives Specific Version 1.0 (19/07/2011) To maintain the favourable conservation condition of the following: Annex I Habitats Estuaries *Coastal Lagoons Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex II Species Otter *Lutra lutra*
UK0016613	Magilligan SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with Salix repens ssp. argenta (Salicion arenariae) Humid dune slacks Embryonic shifting dunes Shifting dunes along the shoreline with Ammophilia arenaria (white dunes) Annex II Species Marsh Fritillary butterfly *Euphydryas* (Eurodryas, Hypodryas) *aurinia* Petalwort *Petalophyllum ralfsii*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK0030383	Skerries and Causeway SAC	Conservation Objectives Specific Version 2.0 (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Sandbanks which are slightly covered by sea water all the time Reefs Submerged or partially submerged sea caves Annex II Species Harbour porpoise *Phocoena phocoena*
UK0030224	North Antrim Coast SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Annual vegetation of drift lines Atlantic salt meadows (*Glauco – Puccinellietalia maritimae*) Shifting dunes along the shoreline with Ammophila arenaria (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Species-rich Nardus grasslands, on silicious substrates in mountain areas (and substation areas in Continental Europe) Vegetated sea cliffs of the Atlantic and Baltic coasts Annex II Species Narrow-mouthed whorl snail *Vertigo angustior*
UK0030055	Rathlin Island SAC	Conservation Objectives Specific Version 3.1 (13/10/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Reefs Vegetated sea cliffs of the Atlantic and Baltic Coasts Submerged or partially submerged sea caves Sandbanks which are slightly covered by sea water all the time Annual vegetation of drift lines
UK0030320	River Foyle & Tributaries SAC	Conservation Objectives Specific Version 3.0 (27/07/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho – Batrachion vegetation Annex II Species Atlantic salmon *Salmo salar* Otter *Lutra lutra*
UK0030326	Tully Bog SAC	Conservation Objectives Specific Version 2.0 (10/07/2018) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats Active Raised Bogs
UK0030233	Owenkillew River SAC	Conservation Objectives Specific Version 3.0 (27/07/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho – Batrachion vegetation Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Bog woodland Annex II Species Freshwater pearl mussel *Margaritifera margaritifera*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Atlantic salmon *Salmo salar* Otter *Lutra lutra*
UK0016608	Teal Lough SAC	Conservation Objectives Specific Version 2.1 (13/10/2017) To maintain (or restore where appropriate) the following feature to favourable condition: Annex I Habitats Blanket Bogs (*if active bog)
UK0030322	Curran Bog SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex II Species Active raised bogs Degraded raised bogs still capable of natural regeneration
UK001659	Ballynahone Bog SAC	Conservation Specific Objectives Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following feature to favourable condition: Annex II Species Active raised bogs
UK0030110	Carn/Glenshane Pass SAC	Conservation Objectives Specific Version 2.1 (10/10/2017) To maintain (or restore where appropriate) the following feature to favourable condition: Annex II Species Blanket bogs (*if active bog)
UK0030399	North Channel SAC	North Channel SAC Annex II Species Harbour Porpoise *Phocoena phocoena*
UK0016618	Strangford Lough SAC	Conservation Objectives Specific Version 3.0 (20/03/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Mudflats and Sandflats not covered by seawater at low tide Coastal Lagoons Large shallow inlets and bays Reefs Annual vegetation of drift lines Perennial vegetation of stony banks Salicornia and other annuals colonizing mud and sand Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Annex II Species Harbour Seal *Phoca vitulina*
UK0030045	Largalinny SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
UK0016609	Black Bog SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Active Raised Bogs
UK0016607	Pettigoe Plateau SAC	Conservation Objectives Specific Version 2.1 (13/10/2017) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Natural dystrophic lakes and ponds Blanket Bogs

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto – Nanojuncetea* Northern Atlantic wet heaths with *Erica tetralix* European dry heaths [4030]
UK0030324	Deroran Bog SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Active Raised Bogs
UK0016611	Fairy Water Bogs SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Active Raised Bogs
UK0030325	Toonagh Beg Bog SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Active Raised Bogs
UK0016619	Monawilkin SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* (*important orchid sites) Old sessile oak woods with Ilex and Blechnum in the British Isles
UK0030047	Lough Melvin SAC	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain (or restore where appropriate) the following features to favourable condition: Annex I Habitats Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflora* and/or of the *Isoet-Nanojuncetea* Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinia caeruleae)* Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Annex II Species Salmon *Salmo salar*
IE0000623	Ben Bulben, Gleniff and Glenade Complex SAC	Conservation Objectives (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: Water courses of plain to montane levels with the *Ranunculion fluitantis and Callitricho-Batrachion* vegetation Northern Atlantic wet heaths with *Erica tetralix* European dry heaths Alpine and Boreal heaths *Juniperus communis* formations on heaths or calcareous grasslands Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels Transition mires and quaking bogs Petrifying springs with tufa formation (*Cratoneurion)* Alkaline fens

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Siliceous scree of the montane to snow levels (*Androsacetalia alpinae and Galeopsietalia ladani*) Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii)* Calcareous rocky slopes with chasmophytic vegetation Geyer's Whorl Snail Vertigo geyeri Otter Lutra lutra
IE0001403	Arroo Mountain SAC	Conservation Objectives (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: Northern Atlantic wet heaths with *Erica tetralix* European dry heaths Alpine and Boreal heaths Blanket bogs (* if active bog) Petrifying springs with tufa formation (*Cratoneurion*) Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii)* Calcareous rocky slopes with chasmophytic vegetation
IE0000428	Lough Melvin SAC	Conservation Objectives (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: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or *Isoeto-Nanojuncetea* Molinia meadows on calcareous, peaty or clayey-silt-laden soils *(Molinion caeruleae)* Salmon *Salmo salar* Otter *Lutra lutra*
IE0001976	Lough Gill SAC	Conservation Objectives (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: Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) Natural eutrophic lakes with Magnopotamion or *Hydrocharition* - type vegetation Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) White-clawed Crayfish *Austropotamobius pallipes* Sea Lamprey *Petromyzon marinus* River Lamprey *Lampetra fluviatilis* Salmon *Salmo salar* Otter *Lutra lutra*
IE0023030	Dunmuckrum Turloughs SAC	Conservation Objectives (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: Turloughs
IE0000138	Durnesh Lough	Conservation Objectives (05/10/2016) 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: Coastal lagoons Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae)*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
IE0000115	Ballintra SAC	Conservation Objectives (09/2006) 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: Limestone Pavements European Dry Heaths
IE0002164	Lough Golagh and Breesy Hill SAC	Conservation Objectives (29/09/2017) 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: Blanket bogs (if active)
IE0001992	Tamur Bog SAC	Conservation Objectives (05/2017) 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: Northern Atlantic wet heaths with Erica tetralix European dry heaths Alpine and Boreal heaths Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) Blanket bogs (*if active bog) Transition mires and quaking bogs Depressions on peat substrates of the Rhynchosporion Alkaline fens Siliceous screes of the montane to snow levels (Androsace*talia alpinae* and *Galeopsietalia ladani*) Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*) Calcareous rocky slopes with chasmophytic vegetation Siliceous rocky slopes with chasmophytic vegetation
IE0001125	Dunragh Loughs/Pettigo Plateau SAC	Conservation Objectives (16/05/2017) 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: Northern Atlantic wet heaths with *Erica tetralix* Blanket bogs (if active bog)
IE000112	River Finn SAC	Conservation Objectives (31/05/2017) 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: Salmon *Salmo salar* Otter *Lutra lutra* Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) Northern Atlantic wet heaths with *Erica tetralix* Blanket bogs (* if active bog) Transition mires and quaking bogs
IE0000133	Donegal Bay (Murvagh) SAC	Conservation Objectives (09/07/2012) 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: Mudflats and sandflats not covered by seawater at low tide Harbour Seal *Phoca vitulina* Fixed coastal dunes with herbaceous vegetation ('grey dunes') Humid dune slack

Site Code	Site Name	Conservation Objectives & Qualifying Interests
IE0000163	Lough Eske and Ardnamona Wood SAC	Conservation Objectives (21/03/2018) 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: Freshwater Pearl Mussel *Margaritifera margaritifera* Salmon *Salmo salar* Killarney Fern *Trichomanes speciosum*
IE0000165	Lough Nillan (Carrickatlieve) SAC	Conservation Objectives (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: Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) Blanket bogs (if active bog)
SAC 002287 SPA 004075	Lough Swilly SPA	Conservation Objectives (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: Estuaries Coastal lagoons Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* Otter *Lutra lutra* Old sessile oak woods with Ilex and Blechnum in the British Isles Great Crested Grebe *Podiceps cristatus* wintering Grey Heron *Ardea cinerea* wintering Whooper Swan *Cygnus cygnus* wintering Greylag Goose *Anser anser* wintering Shelduck *Tadorna tadorna* wintering Wigeon *Anas penelope* wintering Teal An*as crecca* wintering Mallard *Anas platyrhynchos* wintering Shoveler Ana*s clypeata* wintering Scaup Ayth*ya marila* wintering Goldeneye Bucep*hala clangula* wintering Red-breasted Merganser *Mergus serrator* wintering Coot Fulica atra wintering A130 Oystercatcher *Haematopus ostralegus* wintering Knot *Calidris canutus* wintering Dunlin *Calidris alpina* wintering Curlew *Numenius arquata* wintering Redshank *Tringa totanus* wintering Greenshank Tringa nebularia wintering Black-headed Gull *Chroicocephalus ridibundus* breeding Common Gull *Larus canus* wintering Sandwich Tern *Sterna sandvicensis* breeding Common Tern *Sterna hirundo* breeding Greenland White-fronted goose *Anser albifrons flavirostris* wintering Wetlands & Waterbirds
IE0002012	North Inishowen Coast SAC	Conservation Objectives (24/11/2014) 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: Narrow-mouthed Whorl Snail *Vertigo angustior* Mudflats and sandflats not covered by seawater at low tide Perennial vegetation of stony banks

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Vegetated sea cliffs of the Atlantic and Baltic coasts Otter *Lutra lutra* Fixed coastal dunes with herbaceous vegetation (grey dunes) Machairs (in Ireland) European dry heaths
IE0000168	Magheradrumman Bog SAC	Conservation Objectives (24/11/2014) 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: Northern Atlantic wet heaths with *Erica tetralix* Blanket bogs (if active)
UK9020271	Outer Ards SPA	Conservation Objectives Specific Version 4.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Special Conservation Interests Arctic Tern *Sterna paradisaea* Golden Plover *Pluvialis apricaria* Light-bellied Brent Goose *Branta bernicla hrota* Ringed Plover *Charadrius hiaticula* Turnstone *Arenaria interpres* Habitat Extent
UK9020031	Lough Foyle SPA	Conservation Objectives Specific Version 4.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Special Conservation Interests Bewick's Swan *Cygnus columbianus bewickii* Whooper Swan *Cygnus cygnus* Golden Plover *Pluvialis apricaria* Bar-tailed Godwit *Limosa lapponica* Light-bellied Brent Goose *Branta bernicla hrota* Great Crested Grebe *Podiceps cristatus* Cormorant *Phalacrocorax carbo* Greylag Goose *Anser anser* Shelduck *Tadorna tadorna* Wigeon *Anas penelope* Teal *Anas crecca* Mallard *Anas platyrhynchos* Eider *Somateria mollissima* Red-breasted Merganser *Mergus serrator* Oystercatcher *Haematopus ostralegus* Lapwing *Vanellus vanellus* Knot *Calidris canutus* Dunlin *Calidris alpina alpina* Curlew *Numenius arquata* Redshank *Tringa totanus* Waterfowl Assemblage wintering population Habitat Extent Roost sites wintering population
UK9020091	Lough Neagh & Lough Beg SPA	Conservation Objectives Specific Version 4.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Common Tern *Sterna hirundo* Great Crested Grebe *Podiceps cristatus* Whooper Swan *Cygnus cygnus* Bewick's Swan *Cygnus columbianus bewickii* Golden Plover *Pluvialis apricaria*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Pochard *Aythya ferina* Tufted Duck *Aythya fuligula* Scaup *Aythya marila* Goldeneye *Buaephala alangula* Little Grebe *Tachybaptus ruficollis* Comorant *Phalacrocorax carbo* Greylag Goose *Anser anser* Shelduck *Tadorna tadorna* Wigeon *Anas penelope* Gadwall *Anas strepera* Teal *Anas creaca* Mallard *Anas platyrhynchos* Shoveler *Anas clypeata* Coot *Fulica atra* Lapwing *Vanellus vanellus* Wintering waterfowl assemblage Habitat Extent
UK9020221	Larne Lough SPA	Conservation Objectives Specific Version 4.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Light-bellied Brent Goose *Branta bernicla hrota* Common Tern *Sterna hirundo* Roseate Tern *Sterna dougallii* Sandwich Tern *Thalasseus sandvicensis* Habitat Extent
UK9020101	Belfast Lough SPA	Conservation Objectives Specific Version 3.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Redshank *Tringa totanus* Great Crested Grebe *Podiceps cristatus* Habitat Extent
UK9020290	Belfast Lough Open Water SPA	Conservation Objectives Specific Version 2.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Great Crested Grebe *Podiceps cristatus* Habitat Extent
UK9020011	Rathlin Island SPA	Conservation Objectives Specific Version 3.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Peregrine Falcon *Falco peregrinus* Guillemot *Uria aalge* Razorbill *Alea torda* Kittiwake *Rissa tridactyla* Seabird Assemblage breeding population Habitat Extent
UK9020021	Sheep Island SPA	Conservation Objectives Specific Version 3.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Comorant *Phalacrocorax carbo* Habitat Extent
UK9020111	Strangford Lough SPA	Conservation Objectives Specific Version 4.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Light-bellied Brent Goose *Branta bernicla hrota* Knot *Calidris canutus* Common Tern *Sterna hirundo*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Arctic Tern *Sterna paradisaea* Sandwich Tern *Sterna sandvicensis* Redshank *Tringa totanus* Waterfowl assemblage Habitat Extent
UK9020051	Pettigoe Plateau SPA	Conservation Objectives Specific Version 3.0 (01/04/2015) To maintain each feature in favourable condition, as defined by a series of attributes and targets. Golden Plover *Pluvialis apricaria*
UK9020320	East Coast (NI) Marine SPA	To maintain each feature in favourable condition. Great Crested Grebe *Podiceps cristatus* wintering population Red-throated Diver *Gavia stellata* Sandwich Tern *Thalasseus sandvicensis* Common Tern *Sterna hirundo* Arctic Tern *Sterna paradisaea* Manx Shearwater *Puffinus puffinus* Eider Duck *Somateria mollissima*
IE004167	Slieve Beagh – Mullaghfad - Lisnaskea SPA	Conservation Objectives (21/02/2018) To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Hen Harrier *Circus cyaneus*
UK9020031	Lough Foyle SPA	Conservation Objectives (23/09/2014) To maintain or restore the favourable conservation condition of the habitats and species listed: Red-throated Diver *Gavia stellata* Great Crested Grebe *Podiceps cristatus* Bewick's Swan Cygnus *columbianus bewickii* Whooper Swan *Cygnus cygnus* Greylag Goose *Anser anser* Brent Goose *Branta bernicla hrota* Shelduck *Tadorna tadorna* Wigeon *Anas penelope* Teal *Anas crecca* Mallard *Anas platyrhynchos* Eider *Somateria mollissima* Red-breasted Merganser *Mergus serrator* Oystercatcher *Haematopus ostralegus* Golden Plover *Pluvialis apricaria* Lapwing *Vanellus vanellus* Knot *Calidris canutus* Dunlin *Calidris alpina alpina* Bar-tailed *Godwit Limosa lapponica* Curlew *Numenius arquata* Redshank *Tringa tetanus* Black-headed Gull *Chroicocephalus ridibundus* Common Gull *Larus canus* Herring Gull *Larus argentatus* Wetlands
IE004194	Horn Head to Fanad Head SPA	Conservation Objectives (21/02/2018) To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Fulmar *Fulmarus glacialis* Cormorant *Phalacrocorax carbo* Shag *Phalacrocorax aristotelis* Barnacle Goose *Branta leucopsis*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		Peregrine *Falco peregrinus* Kittiwake *Rissa tridactyla* Guillemot *Uria aalge* Razorbill *Alca torda*
IE004057	Lough Derg (Donegal) SPA	Conservation Objectives (21/02/2018) To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Lesser Black-backed Gull *Larus fuscus* Herring Gull *Larus argentatus*
IE004099	Pettigo Plateau Nature Reserve SPA	Conservation Objectives (21/02/2018) To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Greenland White-fronted Goose *Anser albifrons flavirostris*
IE004151	Donegal Bay SPA	Conservation Objectives (17/05/2012) To maintain or restore the favourable conservation condition of the bird species and habitats listed as Special Conservation Interests for this SPA: Great Northern Diver *Gavia immer* wintering Light-bellied Brent Goose *Branta bernicla hrota* wintering Common Scoter *Melanitta nigra* wintering Sanderling *Calidris alba* wintering Wetlands
IE004187	Sligo/Leitrim Uplands SPA	Conservation Objectives (21/02/2012) To maintain or restore the favourable conservation condition of the bird species and habitats listed as Special Conservation Interests for this SPA: Peregrine *Falco peregrinus* Chough *Pyrrhocorax pyrrhocorax*
UK12016	Lough Neagh & Lough Beg Ramsar site	Qualifies under the following criteria of the Ramsar Convention: Criterion 1 – by being the largest freshwater lake in the United Kingdom Criterion 2 – supports over 40 rare or local vascular plants which have been recorded for the site since 1970. Criterion 3 – regularly supports substantial numbers of individuals from particular groups of waterfowl which are indicative of wetland values, productivity and diversity. 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. Criterion 5 – supporting over 20,000 waterfowl in winter. 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. Criterion 7 –supporting a population of Pollan, one of the few locations in Ireland.
UK12002	Belfast Lough Ramsar	Belfast Lough 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.

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK12013	Larne Lough Ramsar	Larne Lough 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.
UK12014	Lough Foyle Ramsar	Lough Foyle 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. 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.
UK12021	Strangford Lough Ramsar	Strangford Lough 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	Outer Ards 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	Pettigoe Plateau 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.

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK12003	Black Bog Ramsar	Black Bog 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	Fairy Water Bog 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.
UK12011	Garry Bog Ramsar site	Garry Bog 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
UK12010	Garron Plateau Ramsar site	Garron Plateau 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. The site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species.
UK12001	Ballynahone Bog Ramsar site	Ballynahone Bog 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.
UK12020	Slieve Beagh Ramsar site	Slieve Beagh 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.
UK12004	Carlingford Lough Ramsar site	Carlingford Lough site qualified under criterion 3a by regularly supporting internationally important populations of sandwich tern. The site also qualifies under Criterion 2a by supporting an important assemblage of vulnerable and endangered Irish Red Data Book bird species. The extended site qualifies under criterion 3c for regularly supporting internationally important numbers of overwintering light-bellied brent geese, oystercatcher, ringed plover, grey plover, dunlin and redshank.
UK0030089	Binevenagh SAC	Conservation Objectives (01/04/2015) 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: • Calcareous rocky slopes with chasmophytic vegetation • Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe) • Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
UK0016610	Garry Bog SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected:

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		• Active raised bog • Degraded raised bog still capable of regeneration • Depressions on peat substrates of the Rhynchosporion
UK0030199	Main Valley Bogs SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Active raised bog • Degraded raised bog still capable of regeneration • Depressions on peat substrates
UK0030303	Wolf Island Bog SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Active raised bog • Degraded raised bog still capable of regeneration • Depressions on peat substrates of the Rhynchosporion
UK0030211	Moneygal Bog SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Active raised bog • Degraded raised bog still capable of regeneration • Depressions on peat substrates of the Rhynchosporion
UK0030244	Rea's Wood and Farr's Bay SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion Incanae, Salicion alvae*)
UK0030296	Upper Ballinderry River SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Freshwater Pearl Mussel *Margaritifera margaritifera* • Water courses of plain to montane levels with the *Ranunculus fluitans and Callitricho-Batrachion* vegetation • Otter *Lutra lutra* • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion Incanae, Salicion alvae*) • Blanket Bog • White-clawed Crayfish *Austropotamobius pallipes* • Atlantic Salmon *Salmo salar*
UK0030214	Montiaghs Moss SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Marsh Fritillary Butterfly *Euphydryas aurinia* • Transition mires and quaking bogs • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caenuleae) • Northern Atlantic wet heaths with Erica tetralix

Site Code	Site Name	Conservation Objectives & Qualifying Interests
UK0030236	Peatlands Park SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Degraded raised bog • Bog Woodland • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles • Active raised bog
UK0016622	Slieve Beagh SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Active blanket bog • Natural dystrophic lakes and pools • European dry heaths
UK0016620	Derryleckagh SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Transition mires and quaking bogs • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
UK0016615	Eastern Mournes SAC	Conservation Objectives (11/10/2017) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • European dry heaths • Northern Atlantic wet heaths with *Erica tetralix* • Active blanket bogs • Alpine and boreal heaths • Siliceous alpine and boreal grasslands • Siliceous rocky slopes with chasmophytic vegetation • Siliceous scree of the montane to snow levels
UK0030277	Slieve Gullion SAC	Conservation Objectives (11/10/2017) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • European dry heaths • Northern Atlantic wet heaths with *Erica tetralix* • Active blanket bogs • Transition mires and quaking bogs
UK0030268	Rostrevor Wood SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
UK0030318	Aughnadarragh Lough SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Marsh Fritillary Butterfly *Euphydryas aurinia*
UK0030323	Dead Island Bog SAC	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected:

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		• Active raised bog • Degraded raised bog still capable of regeneration
IE002306	Carlingford Shore SAC	Conservation Objectives (15/07/2013) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Annual vegetation of drift lines • Perennial vegetation of stony banks
IE000455	Dundalk Bay SAC	Conservation Objectives (19/07/2011) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • Estuaries • Mudflats and sandflats not covered by seawater at low tide • Perennial vegetation of stony banks • Salicornia and other annuals colonising mud and sand • Atlantic salt meadows • Mediterranean salt meadows
IE000453	Carlingford Mountain SAC	Conservation Objectives (17/12/2021) To maintain or restore the favourable conservation condition of the Annex 1 habitat(s) and/or the Annex II species for which the SAC has been selected: • European dry heaths • Alpine and Boreal heaths • Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) • Blanket bogs (*if active bogs) • Transition mires and quaking bogs • Alkaline fens • Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) • Calcareous rocky slopes with chasmophytic vegetation • Siliceous rocky slopes with chasmophytic vegetation
UK9020161 IE004078	Carlingford Lough SPA	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the species listed: • Sandwich tern *Thalasseus sandvicensis* • Common tern *Sterna hirundo* • Light-bellied brent goose *Branta bernicla hrota*
UK9020301	Antrim Hills SPA	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the species listed: • Hen harrier *Circus cyaneus* breeding population • Merlin *Falco columbarius* breeding population
UK9020291	Copelands SPA	Conservation Objectives (01/04/2015) To maintain or restore the favourable conservation condition of the species listed: • Manx shearwater *Puffinus puffinus* breeding population • Arctic Tern *Sterna paradisaea* breeding population
IE004026	Dundalk Bay SPA	Conservation Objectives (19/07/2011) To maintain or restore the favourable conservation condition of the species listed: • Great crested grebe *Podiceps cristatus* • Greylag goose *anser anser* • Light-bellied brent goose *Branta bernicla hrota*

Site Code	Site Name	Conservation Objectives & Qualifying Interests
		• Shelduck *Tadorna tadorna* • Teal *Anas crecca* • Mallard *Anas platyrhynchos* • Pintail *Anas acuta* • Common scoter *Melanitta nigra* • Red-breasted merganser *Mergus serrator* • Oystercatcher *Haematopus ostralegus* • Ringed plover *Charadrius hiaticula* • Golden plover *Pluvialis apricaria* • Grey plover *Pluvialis squatarola* • Lapwing *Vanellus vanellus* • Knot *Calidris canutus* • Dunlin *Calidris alpina* • Black-tailed godwit *Limosa limosa* • Bar-tailed godwit *Limosa lapponica* • Curlew *Numenius arquata* • Redshank *Tringa tetanus* • Black-headed gull *Chroicocephalus ridibundus* • Common gull *Larus canus* • Herring gull *Larus argentatus* • Wetland and waterbirds
IE004167	Slieve Beagh SPA	Conservation Objectives (23/09/2022) To maintain or restore the favourable conservation condition of the species listed: • Hen harrier *Circus cyaneus*
	Carlingford Marine Proposed SPA	Conservation Objectives (01/01/2020) To maintain or restore the favourable conservation condition of the species listed: • Sandwich tern *Thalasseus sandvicensis* • Common tern *Sterna hirundo* • Light-bellied brent goose *Branta bernicla hrota*

Table 4.5: 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?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
Asset Replacement Projects			
Ballylumford - Eden 110 kV Circuit Uprate	No. Project does not intersect with European sites.	Yes. Project has potential in catchment of downstream European sites.	Yes. Project close to a number of European sites.
Ballylumford Switchgear Replacement (T501)	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 is not in proximity to European sites.
Coolkeeragh - Magherafelt 275 kV Circuits Refurbishment (T502)	Yes. Project intersects with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project intersects with European sites.
Enniskillen Main Transformer 1 and 2 Replacement (T14)	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 Transformer Tx B Replacement (T14)	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 Shunt Reactor 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 Replacement (T13)	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 275 kV Structures, Busbars and Disconnectors 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 Shunt Reactor Replacement (T15)	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
Kilroot 275 kV CT Replacement Phase 1 (T11p)	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.
Strabane Main 110 kV Refurbishment (T10)	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.
RP6 275 kV Tower Maintenance (T17)	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.
RP6 110 kV Tower and Overhead Line Maintenance (T19)	No. Project does not intersect with European sites.	Yes. Project has potential in catchment of downstream European sites.	Yes. Project in catchment of downstream European sites.
RP6 110 kV Cable Maintenance (T20)	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.
RP6 110 kV Transmission Protection (T602)	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.
RP6 275 kV Transmission Protection (T602)	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.
RP6 22 kV Transmission Protection (T602)	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.
Miscellaneous RP6 Works (T11a-T11n, T11r, T12d-T12q, T12s, T16, T40)	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
Castlereagh – Rosebank Tower Line Removal	No. Project is not within a European site	Yes. Project has potential pathway to downstream European sites.	Yes. Project in catchment of downstream 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.
Ballylumford 275 kV CVT 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 Interbus 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.
Castlereagh Inter-Bus Transformer 3 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.
Cregagh 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.
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.
Dungannon Main Tx1 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 110 kV Pantograph and CT Replacement	No. Project is not within any European site.	No Project is not hydrologically connected to any European sites.	No Project is not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
Kells Shunt Reactor 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.
Kilroot 275 kV CT Replacement Phase 2 (T11p)	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.
Kilroot CVT 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.
Loguestown 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.
Noise Enclosures	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.
Rathgael 110 kV Structures Replacement	No. Project is not within European sites.	No. Project has no pathway to downstream European sites.	No, Project not in proximity to European sites.
Standby Generators	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 Replacement	No. Project is not within European sites.	No. Project has no pathway to downstream European sites	No, Project not in proximity to European sites.
RP7 275 kV Tower and Overhead Line Maintenance	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.
RP7 110 kV Tower and Overhead Line Maintenance	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
RP7 110 kV Cable 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.
RP7 110 kV Transmission Protection	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.
RP7 275 kV Transmission Protection	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.
Miscellaneous RP7 Works	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.
Renewable Generation Cluster Substations and New Connections			
Cam Cluster Substation (NEW)	No. Project does not intersect with European sites.	No. project is not hydrologically connected to European sites downstream.	No, Project not in proximity to European sites.
Kells 110/33 kV Cluster	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	Project not in proximity to European sites.
Renewable Integration Developments			
Coolkeeragh 110 kV Extension	No. Project does not intersect with European sites	No. project is not in catchment of European sites.	Yes. Project located adjacent to intertidal wetlands outside of a European site and within 1 km of a European site.
Coolkeeragh – Killymallaght – Strabane 110 kV Uprate	No. Project does not intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Project in catchment of downstream European sites.
Coolkeeragh – Limavady – Coleraine 110 kV Uprate (NEW)	No. Project does not intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Project in catchment of downstream European sites.
Limavady Transformer Replacement (NEW)	No. Project is contained within confines of existing substation footprint.	No. Project is contained within confines of existing substation footprint with no pathway to	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
Gort 110/33 kV 2nd Transformer	No. Project does not intersect with European sites.	No. Project is not in catchment of downstream European sites.	No, Project not in proximity to European sites.
Mid-Antrim Upgrade	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
North Sperrin Generation Substation (NEW)	Yes. Project intersects with European sites.	Yes. Project in catchment of downstream European sites.	Yes. Project potentially proximity to European sites.
North West of NI 110 kV reinforcement	Yes. Potential to intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Potentially proximate to European sites.
Mid Tyrone Project	No. Project does not intersect with European sites.	Yes. Project potentially in catchment of European sites	No. Project not in proximity.
Omagh main – Dromore 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.
Strabane – Omagh 110 kV Uprate	Yes. Project potentially intersects with European site.	Yes. Project in catchment of downstream European sites.	Yes. Project in potential proximity to European sites
Ballylumford – Ballyvallagh 110 kV Uprate (NEW)	No. Project does not intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Project in potential proximity to European sites
Larne Transformer Replacement (NEW)	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.
Tamnamore – Drumnakelly 110 kV Uprate	No. Project does not intersect with European sites	Yes. Project in catchment of downstream European sites.	Yes. Project in potential proximity to European sites
Load Related and Security of Supply			
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.
East Tyrone Reinforcement Project	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 not within a European site.	No. Project is contained within confines of existing substation footprint with no pathway to	No, Project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
New North West 110kV switching station	Yes. Project is within a European site.	Yes. Project is connected hydrologically to European site.	Yes, project is in proximity.
Coolkeeragh 275 kV Redevelopment	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.
Energising Belfast	No. Project is not within a European site	Yes project is within the catchment of European sites	Yes, project is in potential proximity to European site.
Carnmoney – Eden Reinforcement	No. Project is not within a European site	Yes project is within the catchment of European sites	No. project is not in proximity to European site.
Airport Road 110/33 kV substation	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.
Armagh and Drumnakelly Reinforcement	No. Project does not intersect with European sites.	Yes. Project in catchment of downstream European sites.	No, Project not in proximity to European sites.
Newry Reinforcement	No project is not within any European sites.	Yes. Project in catchment of downstream European sites.	No, project not in proximity to European sites.
Shunt Reactors - Castlereagh, Tandragee and Tamnamore	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.
Fault Level Replacements			
Castlereagh 110 kV Switchgear Replacement	No project is not within any European sites.	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 Switchgear Replacement	No project is not within any European sites.	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 275 kV Redevelopment	No project is not within any European sites.	No. Project is contained within confines of existing substation footprint with no pathway to	No, project not in proximity to European sites.

Project	Can an impact pathway be reasonably established between the potential project and a European site?		
	Habitat Loss	*Water quality and habitat deterioration*	*Disturbance and Displacement*
		downstream European sites.	
Kells 275 kV Redevelopment	No project is not within any European sites.	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.
Magherafelt 275 kV Redevelopment	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 275 kV Redevelopment	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.
Interconnection			
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.
Moyle Interconnector Capacity Increase	Yes. Potential project is within a European site boundary.	Yes. Project in catchment of downstream European sites.	Yes Potentially proximate to European sites
Projects in both planning areas			
CVT Upgrade for Harmonic Measurement	No. project is not within any European sites.	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.
Filter Tuning/Replacement (On hold)	No. Project is not within any European sites.	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.

Table 4.6: European sites that could have LSEs as a result of the implementation of the potential Projects

Projects	European sites that could experience a likely significant effect		
	Habitat Loss	*Water Quality and Habitat Deterioration*	*Disturbance and Displacement*
Asset Replacement Projects			
Ballylumford - Eden 110 kV Circuit Uprate		East Coast Marine SPA Larne Lough ramsar	East Coast Marine SPA Larne Lough ramsar
Coolkeeragh - Magherafelt 275 kV Circuits Refurbishment (T502)	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
RP6 110 kV Tower and Overhead Line Maintenance (T19)		Belfast Lough SPA and Ramsar Belfast Lough open water SPA East Coast Marine Proposed SPA	Belfast Lough SPA and Ramsar Belfast Lough open water SPA East Coast Marine Proposed SPA
Castlereagh – Rosebank Tower Line Removal		Belfast Lough SPA and Ramsar Belfast Lough open water SPA East Coast Marine Proposed SPA	Belfast Lough SPA and Ramsar Belfast Lough open water SPA East Coast Marine Proposed SPA
Renewable Generation Cluster Substations and New Connections			
Kells 110/33 kV Cluster		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Renewable Integration Developments			
Coolkeeragh 110 kV Extension			Lough Foyle SPA Lough Foyle ramsar
Coolkeeragh – Killymallaght – Strabane 110 kV Uprate		River Finn SAC Lough Foyle SPA Lough Foyle Ramsar River Faughan and tributaries SAC	Lough Foyle SPA Lough Foyle ramsar
Coolkeeragh – Limavady – Coleraine 110 kV Uprate (NEW)		River Finn SAC Lough Foyle SPA Lough Foyle Ramsar River Roe and Tributaries SAC	Lough Foyle SPA Lough Foyle ramsar
Mid-Antrim Upgrade		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	

Projects	European sites that could experience a likely significant effect		
	Habitat Loss	*Water Quality and Habitat Deterioration*	*Disturbance and Displacement*
North Sperrin Generation Substation (NEW)	Carn-Glenshane pass SAC River Roe and tributaries SAC Ballynahone Bog SAC and ramsar River Faughan and tributaries SAC Teal lough SAC Curran Bog SAC	River Roe and tributaries SAC River Faughan and tributaries SAC Owenkillew River SAC Teal Lough SAC	River Roe and tributaries SAC River Faughan and tributaries SAC
North West of NI 110 kV 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 Outer Ards SPA Sheep Island SPA River Foyle & Tributaries SAC Tully Bog SAC Owenkillew 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 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 Foyle & Tributaries SAC Tully Bog SAC Owenkillew 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	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 Banagher Glen SAC Ballynahone Bog Ramsar Site Lough Neagh & Lough Beg SPA Lough Neagh & Lough Beg Ramsar Site Outer Ards Ramsar Site
Mid Tyrone Project			Lough Neagh and Lough Beg SPA and ramsar
Omagh main – Dromore Uprate		River Foyle and Tributaries SAC Lough Foyle SPA Lough Foyle Ramsar Site	
Strabane – Omagh 110 kV Uprate	River Foyle and tributaries SAC	River Foyle and tributaries SAC River Finn SAC	River Foyle and tributaries SAC

Projects	European sites that could experience a likely significant effect		
	Habitat Loss	*Water Quality and Habitat Deterioration*	*Disturbance and Displacement*
Ballylumford – Ballyvallagh 110 kV Uprate (NEW)		Larne lough SPA and Ramsar East coast marine SPA	Larne lough SPA and Ramsar
Tamnamore – Drumnakelly 110 kV Uprate		Lough Neagh and Lough Beg SPA and Ramsar	Lough Neagh and Lough Beg SPA and Ramsar
Load Related and Security of Supply			
New North West 110kV switching station	River Faughan SAC	River Faughan SAC Lough Foyle SPA and ramsar	River Faughan SAC Lough Foyle SPA and ramsar
Energising Belfast		Belfast Lough SPA and Ramsar Belfast lough open water SPA	Belfast Lough SPA and ramsar
Carnmoney – Eden Reinforcement		Belfast Lough SPA and Ramsar Belfast lough open water SPA	Belfast Lough SPA and ramsar
Armagh and Drumnakelly Reinforcement		Lough Neagh & Lough Beg Ramsar Site Lough Neagh & Lough Beg SPA	
Newry Reinforcement		Carlingford shore SAC Carlingford Lough SPA (NI/ROI) Carlingford Lough ramsar Carlingford marine SPA Derryleckagh SAC Carlingford Shore SAC Carlingford Lough Ramsar site Rostrevor Wood SAC	
Interconnection			
Moyle Interconnector Capacity Increase	Larne Lough SPA Larne Lough Ramsar East Coast Marine SPA	Larne Lough SPA Larne Lough Ramsar East Coast Marine SPA North Channel pSAC The Maidens SAC	Larne Lough SPA Larne Lough Ramsar East Coast Marine SPA

4.5 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, seventy nine potential projects that could come forward under the TDPNI during the plan period were screened for appropriate assessment against one hundred and five European sites and sites in the UK National Network of Sites. These potential effects are outlined in Table 4.2 and Table 4.3. Of these, the possibility of likely significant effects could not be excluded at the screening stage for forty two European sites or sites in the UK National Network of Sites, under the following themes and as described in Table 4.3:

- The possibility of likely significant **Habitat Loss** effects cannot be excluded for thirty two European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these sites.
- The possibility of likely significant **Water Quality and Habitat Deterioration** effects cannot be excluded for forty one European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these sites.
- The possibility of likely significant **Disturbance and Displacement** effects cannot be discounted for twenty five European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these 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 Potential 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 4.5**.

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 by vehicles, sea going vessels, plant and machinery. 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. Changes in sedimentation along the coast could have potential impacts on Annex I habitats through smothering such as ‘Reefs’ as well as have the potential to impact coastal processes and

therefore affect the associated habitats and species such as 'sandbanks'. Hydrological connectivity between a construction site and any 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 some.

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 riverbanks 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 riverbed. 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 (Gilbert et al., 2021) may occur if they do not use traditional feeding or roosting sites after installation of a new power line. Also, overwintering feature species populations use intertidal wetlands outside of the designated areas to feed and roost in addition to those within the designated areas. Where elements of the Plan may be brought forward adjacent to intertidal wetlands not themselves in designated areas but functionally linked to wetlands within the European sites, in accordance with the 'Holohan' principles (section 2.2.3), implications of a proposed project adjacent to intertidal wetlands on the species of a European site to be found outside the boundaries of that site, must also be considered if those implications are liable to affect the conservation objectives of the site.

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).

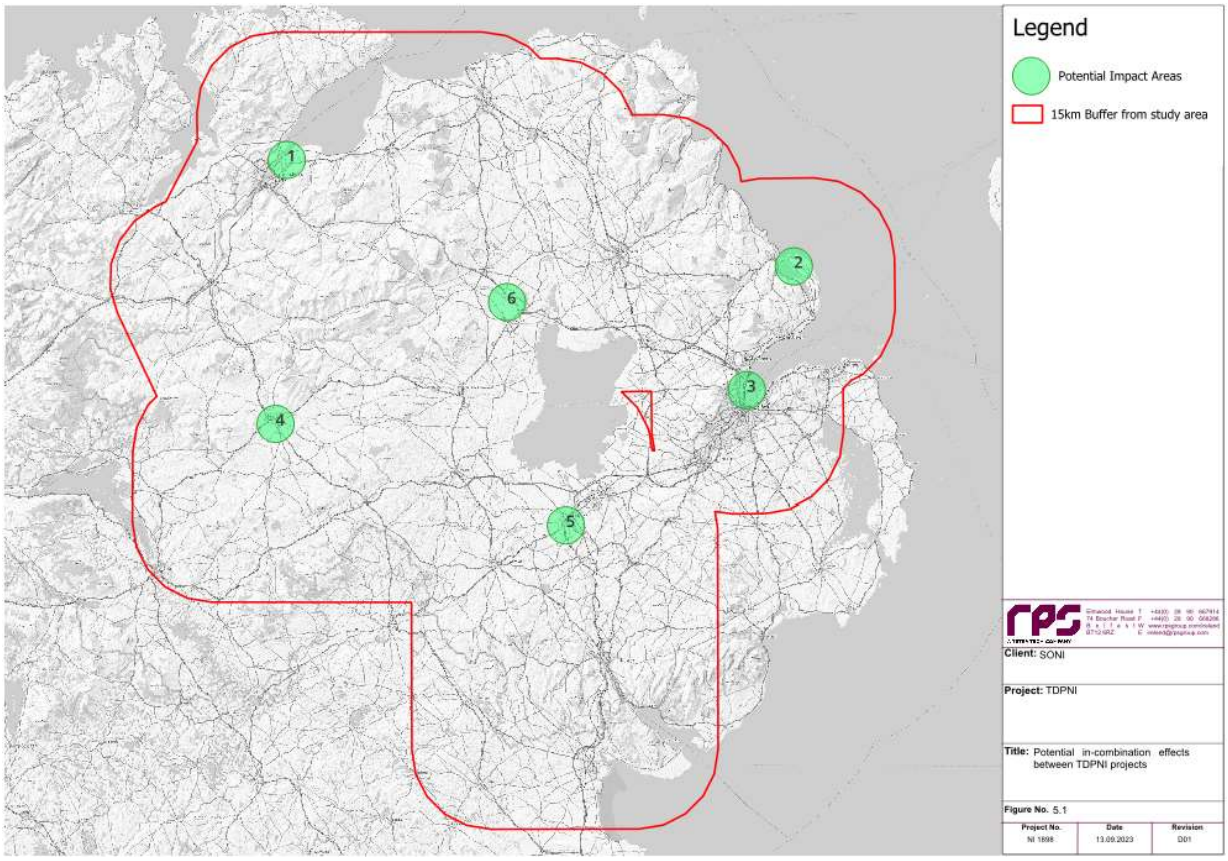
5.2 In-Combination Effects

5.2.1 TDPNI

An assessment under the Habitats Regulations 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 Circuits Refurbishment, Coolkeeragh – Killymallaght – Strabane 110 kV Uprate or New North West 110kV switching station and Coolkeeragh – Limavady – Coleraine 110 kV Uprate (NEW) 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 (Larne)

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 Ballylumford – Ballyvallagh 110 kV Uprate (NEW) or Ballylumford - Eden 110 kV Circuit Uprate and Moyle Interconnector Capacity Increase 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 Ballylumford – Ballyvallagh 110 kV Uprate (NEW) or Ballylumford - Eden 110 kV Circuit Uprate and Moyle Interconnector Capacity Increase 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 3 (Belfast)

There is potential for in-combination disturbance and displacement effects to occur in the Belfast Lough European sites between the Castlereagh – Rosebank Tower Line Removal or Energising Belfast and Carnmoney – Eden Reinforcement 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 Castlereagh – Rosebank Tower Line Removal or Energising Belfast and Carnmoney – Eden Reinforcement 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 Restring 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 4 (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 – Dromore Uprate, Strabane – Omagh 110 kV Uprate , Mid Tyrone project and 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 5 (Portadown)

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh European sites between Armagh and Drumnakelly, Drumnakelly to Tamnamore 110kv uprate and Newry Reinforcement 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 6 (Magherafelt)

There is the potential for in-combination water quality and deterioration effects to occur in the Lough Neagh European sites between the Magherafelt 275kV Redevelopment and North Sperrin Regeneration substation 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.

5.2.2 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
Grid25/ Grid25 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.	The core strategy must, among other aspects: - Detail and take account of existing and proposed transmission infrastructure in a county; 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.	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. 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. 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.
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.	The framework's four goals are to: build competitive markets; ensure security of supply; enhance sustainability; and develop energy infrastructure.	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	Ireland is obliged to reach a target of 16% of all energy consumed in the	AA of this Plan found that it would be possible to achieve the high scenario of 4,500MW from offshore wind and

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	offshore renewable energy resources for increasing indigenous production of renewable electricity, thereby contributing to reductions in our greenhouse gas emissions,	State coming from renewable sources by 2020. This obligation is to be met by 10% in transport, 12% from heat and 40% from electricity	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.
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.	Northern Ireland has a target of 40% electricity consumption from renewable resources by 2020.	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	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. This Plan builds from the Strategy Energy Frameworks, 2010. Building energy markets Ensuring security supple Enhancing sustainability and development of competitive energy markets Increasing the level of electrify and heat from renewable sources	The aim is underpinned by three strategic objects: Reduce greenhouse gas emission from transport. Protect biodiversity Reduce water, noise and air pollution	The Plan was not subject to a HRA, but notes that all renewable energy projects taken forward under the OREAP (above) will have to be screened to determine the need for a HRA.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
The Northern Ireland Climate Change Adaptation Programme 2014-2019	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. Adaptation Programme, four primary areas for action are as follows: Flooding; Water; Natural Environment; and Agriculture and Forestry The high level actions and key activities for each primary area have been identified within the Adaptation Programme.	The Adaptation Programme focuses on three adaptation principles: Integrating adaptation into relevant key policy areas; Developing the evidence base; and Communication and cooperation	The Plan was not subject to a HRA.
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.	The proposals of this Strategy are as follows: The development of a Waste Prevention Programme; A new 60% recycling target for local authority collected municipal waste (LACMW); The introduction of a statutory requirement on waste operators to provide specified data on commercial and industrial waste; New and more challenging collection and recycling targets for packaging and WEEE; The introduction of a landfill restriction on food waste;	The Plan was not subject to a HRA.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
		The potential for the devolution of landfill tax; The implementation of legislation on carrier bags; The development of detailed proposals for an Environmental Better Regulation Bill.	
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.	The Action Plan proposes to: Deliver a communications campaign to build public awareness, understanding of and confidence in recycling. Undertake a Recycling Gap study to identify kerbside recycling options. Provide £2.5m to the Rethink Waste Capital fund in 2016/17 with further government support planned for successive years. Support the development of strategic infrastructure for treating and recovering waste; and support separate treatment of food waste	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.

5.2.3 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 2nd River Basin Management Plan 2018-2021 (2017) (Ireland)	Aims to set out river basin management planning in Ireland. This leads on from the 1st Cycle River Basin Management Plans: 2009-2014.	Details the most recent water quality results and the outcomes of the risk characterisation process. Informs on the significant pressures for at-risk waterbodies. Sets out the environmental objectives of the WFD and the priorities. Outlines the key measures aimed at meeting our environmental objectives. Outlines measures to be taken to improve stakeholder engagement.	A NIS was prepared for the 2nd 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	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. Establish a framework for the protection of waterbodies at River Basin District (RBD) level Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of waterbodies in that RBD Promote sustainable water usage	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 Identifies and manages waterbodies in the RBD Establishes a programme of measures for monitoring and improving water quality in the RBD Involves the public through consultations RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.	The plan was subject to a 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	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. Establish a framework for the protection of waterbodies at River Basin District (RBD) level	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 Identifies and manages waterbodies in the RBD	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
	Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of waterbodies in that RBD Promote sustainable water usage	Establishes a programme of measures for monitoring and improving water quality in the RBD Involves the public through consultations RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.	
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. Establish a framework for the protection of waterbodies at River Basin District (RBD) level Preserve, prevent the deterioration of water status and where necessary improve and maintain “good status” of waterbodies in that RBD Promote sustainable water usage	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 Identifies and manages waterbodies in the RBD Establishes a programme of measures for monitoring and improving water quality in the RBD Involves the public through consultations RBMPs are prepared and reviewed every six years. The first RBMPs covered the period 2010 to 2015.	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	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: A description of the objectives set for the management of flood risks. Identification of structural and non-structural measures for achieving those objectives within each SFRA and their priority.	The approaches proposed within the Plans are grouped under three main measures: Prevention Preparedness Protection 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.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	Significant Flood Risk Areas (SFRAs). FRMPs have been prepared for the North Western, North Eastern and Neagh-Bann River Basin Management areas.	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.	Approaches proposed under Protection include the possibility of structural approaches and may result in potentially significant impacts upon European sites, but that at a project level, structural approaches will require consent including a project level HRA and targeted mitigation as necessary to ensure no adverse effect on integrity.
River Basin – Local Management Area Action Plans	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: Bush Lagan South Down Strangford Belfast Lough Glens and Rathlin Quoile Larne Lough	Local Management Areas (LMAs) were derived from surface waterbodies. They were created to manage and improve water quality at a local level through local involvement.	The various specific LMA Action Plans have not been subject to HRA.

5.2.4 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.

It is noted that a number of draft Local Development Plans have been published by local authorities, these plans, given their draft state, do not include all the specifics in respect of allocations or zoning of sites for development which are likely to come forward. As such the extent to which the potential for significant effects arising upon European sites can be accurately assessed is largely limited to the draft strategy and policies. Where such plans are not available in draft form no assessment of the potential for in-combination effects can be undertaken. It is further noted that where plans are unadopted and not yet subject to inspection the potential for such effects to arise is not yet certain.

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.	The 8 aims of the RDS are: Support strong, sustainable growth for the benefit of all parts of Northern Ireland Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West Support our towns, villages and rural communities to maximise their potential Promote development which improves the health and well-being of communities Improve connectivity to enhance the movement of people, goods, energy and information between places Protect and enhance the environment Take actions to reduce our carbon footprint and facilitate adaptation to climate change Strengthen links between north and south, east and west, with Europe and the rest of the world	The Plan was not subject to a 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 a 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.	Strategic Objectives: to protect and enhance the natural and man-made environment;	The Plan was not subject to a 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
		to meet the future development needs of the rural community; to facilitate regeneration of the rural economy; to accommodate change, while maintaining the character of the countryside; to revitalise rural towns and villages in order to make them more attractive places in which to live and work; and to promote a high quality of design for new development	
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 the area.	As the associated Plan is in development this paper has not, as of yet, been subject to a 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 the area.	The Plan was not subject to a 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 the area	The Plan was subject to a 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.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European 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 the area	The Plan was not subject to a HRA.
Armagh Area Plan 2018 – Issues Paper	The Armagh Area Plan 2018 provides a policy 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.	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 a 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 a 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 the area.	The Plan was not subject to a 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	Identifies issues of relevance to the area and outlines principles for future development of the area.	The Plan was subject to a 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 / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	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.		Plan would not result in any significant adverse effect upon any European designated sites.
Belfast Local Development Plan 2035 – Draft Plan Strategy	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 2035. It is noted that the draft form of this plan does not include all specific allocations likely to come forward.	Identifies issues of relevance to the area and outlines principles for future development of the area.	The draft plan was subject to a HRA by SES on behalf of the Belfast City Council. This assessment concluded that significant uncertainty remains as to the potential for significant effects, given the plans draft status, and as such any further detail to be included within the finalised plan, will be further addressed within the updated HRA and will ensure that no significant effects arise upon any European 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 the area.	The Plan was subject to a 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 the area.	The Plan was not subject to a 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 the area.	The Plan was not subject to a 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 the area.	The Plan was not subject to a 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 the area.	The Plan was not subject to a HRA. Internationally designated sites, including SACs, SPAs and Ramsar sites are addressed within the relevant section on conservation (pg. 63-67).
Fermanagh and Omagh Local Development Plan 2030 – Draft Plan Strategy (October 2018)	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	Identifies issues of relevance to the area and outlines principles for future development of the area.	The draft plan was subject to a HRA by SES on behalf of the Fermanagh and Omagh District Council. This assessment concluded that while significant uncertainty remains as to the potential for significant effects, given the plans draft

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
	area for the period up to 2030. It is noted that the draft form of this plan does not include all specific allocations likely to come forward.		status, it was considered likely that policies within the plan will ensure that no significant effects arise upon any European sites.
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 a 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.
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 the area.	The Plan was not subject to a 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 the area.	The plan was subject to a 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.
Mid Ulster Local Development Plan 2030 – Draft Plan Strategy (February 2019)	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 2030. It is noted that the draft form of this plan does not include all specific allocations likely to come forward.	Identifies issues of relevance to the area and outlines principles for future development of the area.	The draft plan was subject to a HRA by SES on behalf of the Mid Ulster District Council. This assessment concluded that while significant uncertainty remains as to the potential for significant effects, given the plans draft status, it was considered likely that the implementation of mitigation measures will ensure that no significant effects arise upon any European sites.

Plan / Programme	High Level Description	Key Objectives and Policies	Effects on European sites
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 the area.	The Plan was not subject to a 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 the area.	The Plan was subject to a 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 a 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 the area.	The plan was not subject to a 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 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 the area.	As the plan is in development it has not, as of yet, been subject to a 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 & MITIGATION MEASURES

The section sets out the strategic approach to mitigation to address potential adverse effects on the integrity of European sites outlined in **Table 4.6** 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

Avoidance	Seek options that avoid harm to ecological features (for example, by locating project on an alternative site).
Mitigation	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
Compensation	Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
Enhancement	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 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 UK National Site Network and the Natura 2000 Network in the Republic of Ireland.

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 HRA.

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[4].

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.

Biosecurity protocols shall be created and adhered to during construction.

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.

[4] http://www.eirgrid.ie/about/in-the-community/environment/

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 re-seeding with an appropriate range of native species of native or, wherever possible, local provenance 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 DAERA standing advice for development that may have an effect on the water environment (including groundwater and fisheries), NIEA Pollution Prevention Guidance (DAERA, 2022) 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 of 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 reduce 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 flight lines (e.g. regular flight lines for feature species birds related to, but outside of an SPA) or areas of supporting habitat (e.g. foraging areas for feature species birds in close proximity to, but out with 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

Whilst there are no marine projects proposed by the Plan and as there are no intended or reasonably foreseeable marine works, freshwater system cable crossings may occur. Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise (JNCC, 2010) and appropriate legislation (i.e. The Habitats Regulations (as amended) and Wildlife (NI) Order 1985 (as amended)) will be followed for any proposed freshwater crossing 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 and the UK National Network of 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 excluded for thirty two European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these sites.
- The possibility of likely significant **Water Quality and Habitat Deterioration** effects cannot be excluded for forty one European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these sites.
- The possibility of likely significant **Disturbance and Displacement** effects cannot be discounted for twenty four European sites or sites in the UK National Network of Sites without further evaluation and analysis, or the application of measures intended to avoid or reduce the harmful effects of the potential projects on these 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 TDPNI on European sites and the UK National Network of Sites; and taking into consideration (1) 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, and (2) the mitigation measures laid out in section 6 of this report detailing impact specific procedures to be put in place which further limit the potential for negative impacts to occur, it is concluded that implementation of the TDPNI will not adversely affect the integrity of any European site or the UK National Network of Sites.

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