



# North-South 400kV Interconnection Development



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Natura Impact  
Statement

**5**  
VOLUME

# North-South 400 kV Interconnection Development

## Natura Impact Statement

Volume 5



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# 1 INTRODUCTION

- 1 EirGrid plc (EirGrid) and System Operator Northern Ireland Ltd (SONI) (the respective applicants)<sup>1</sup> are jointly planning a major cross-border electricity transmission development between the existing high-voltage transmission networks of Ireland<sup>2</sup> and Northern Ireland. The overall interconnection project (which is termed the 'proposed interconnector') is a 400 kV overhead line (OHL) circuit linking the existing 400 kV substation in Woodland, County Meath with a planned substation in Turleenan, County Tyrone. The proposed interconnector will provide a second high capacity electricity interconnector between Ireland and Northern Ireland. The existing interconnector is a 275 kV double circuit OHL which connects the existing Tandragee and Louth substations. The proposed interconnector is planned to traverse the counties of Tyrone, Armagh, Monaghan, Cavan and Meath.
  
- 2 Given its location across two jurisdictions, the proposed interconnector consists of two related and complementary developments, as follows:
  - 1) A development being proposed by SONI for that portion of the overall interconnection project located in Northern Ireland (the SONI proposal); and
  - 2) A development being proposed by EirGrid for that portion of the overall interconnection project located in Ireland (i.e. in counties Monaghan, Cavan and Meath) which forms the subject matter for this application for planning approval. The application is titled the 'North-South 400 kV Interconnection Development' or 'the proposed development' for the purposes of this Natura Impact Statement (NIS) (the EirGrid proposal).
  
- 3 For the avoidance of doubt, the proposed development is not directly connected with or necessary to the management of a European site and hence the requirements of Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended, in respect of Appropriate Assessment are engaged. Accordingly, this NIS has been prepared to address the likely or possible significant effects, if any, of the proposed development located in counties Monaghan, Cavan and Meath on sites designated as Natura 2000 conservation areas, also defined in Irish legislation as 'European sites', whether those Natura 2000 conservation sites are located in Ireland or in Northern Ireland. The NIS is, accordingly, included with the application submitted to An Bord Pleanála (the Board) for planning approval of the proposed development.

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<sup>1</sup> The planning function in respect of that portion of the proposed interconnector within Northern Ireland was originally undertaken by Northern Ireland Electricity (NIE). However, NIE was obligated by the European Commission to transfer its investment planning function (the "Planning Function") to SONI. The SONI transmission system operator licence (the "Licence") was amended on 28<sup>th</sup> March 2014 to take account of the transfer of the Planning Function following a consultation process by the Northern Ireland Authority for Utility Regulation (NIAUR). The Licence amendments took effect on 30<sup>th</sup> April 2014. Accordingly, responsibility for the pursuance of the planning application in respect of the proposed interconnector within Northern Ireland has been transferred from NIE to SONI.

<sup>2</sup> Often referred to as 'Republic of Ireland'.

- 4 Given the overall geographical extent of this linear development, the proposed development is presented in two sections for the purposes of the application to the Board. This approach will facilitate public participation in respect of that portion of the proposed development which is of most relevance to a particular location, rather than necessarily having to seek this information as part of a much larger study area. However, for the avoidance of doubt, the entirety of the proposed development is evaluated in the Environmental Impact Statement (EIS) and this Natura Impact Statement (NIS). The development study areas comprise: the Cavan Monaghan Study Area (CMSA) and the Meath Study Area (MSA).
- 5 The SONI proposal for that portion of the proposed interconnector located in Northern Ireland also considers those European sites which have been assessed as being relevant to that specific section of the proposed interconnector. The SONI assessment is detailed in the *Tyrone to Cavan Interconnector Consolidated ES Addendum and Habitats Regulations Assessment Stage 2: Statement to Inform Appropriate Assessment*.
- 6 This NIS considers relevant European sites in both jurisdictions, insofar as there is the possibility of there being a significant effect on those European sites from that portion of the interconnection development located in counties Monaghan, Cavan and Meath between the crossing points of the jurisdictional border with Northern Ireland (between the townland of Doohat or Crossreagh, County Armagh, and the townland Lemgare, County Monaghan), to the townland of Bogganstown (Electoral District (ED) Culmullin), County Meath including the substation at Woodland, County Meath. Given the nature and scale of this linear electricity transmission development, EirGrid considered whether there is the possibility for the proposed development to have significant direct, indirect or cumulative effects, on European sites, or to sensitive ecological receptors which are qualifying interests for specific European sites in the vicinity of the proposed development. Consideration was also given to possible adverse effects to qualifying interests beyond the boundaries of the proposed development, which may be linked to activities associated with that development. Therefore, as is set out below, a Stage One screening exercise was undertaken by the developer and, for the reasons stated, EirGrid concluded that a Stage Two Appropriate Assessment is required to be undertaken by the competent authority (i.e. An Bord Pleanála in this instance) pursuant to Article 6(3) of Directive 92/43/EEC (Habitats Directive). Notwithstanding the consideration of these issues by the developer, the Board is required to carry out screening for Appropriate Assessment prior to giving consent and, in circumstances where the application for planning approval is accompanied by this NIS, there is an implicit acceptance that it is possible that the proposed development may have a significant effect on a European site. Accordingly, this NIS provides information to enable the Board to carry out both a Stage One screening for Appropriate Assessment and, thereafter, a Stage Two Appropriate Assessment (AA), having considered the NIS and other information submitted to the Board from prescribed authorities, planning authorities and persons who make submissions or observations on the application for planning approval.

- 7 The contents of the NIS have been informed by a detailed desk-top review of all available relevant information, together with extensive field surveys. Importantly, as part of the overall process, various route alternatives were considered.
- 8 Extensive consultation has also been conducted with the National Parks and Wildlife Services (NPWS) of the Department of Arts, Heritage and the Gaeltacht, Inland Fisheries Ireland (IFI) and BirdWatch Ireland (BWI) to ensure that issues raised could be addressed at an early stage. This NIS has been prepared and reviewed by experienced, qualified ecologists from TOBIN Consulting Engineers and Wetland Surveys Ireland. The ecologists involved in the production of the EIS are listed below<sup>3</sup> and all are full members of the Chartered Institute of Ecology and Environmental Management (CIEEM).

## 1.1 BACKGROUND TO THE PROPOSED DEVELOPMENT

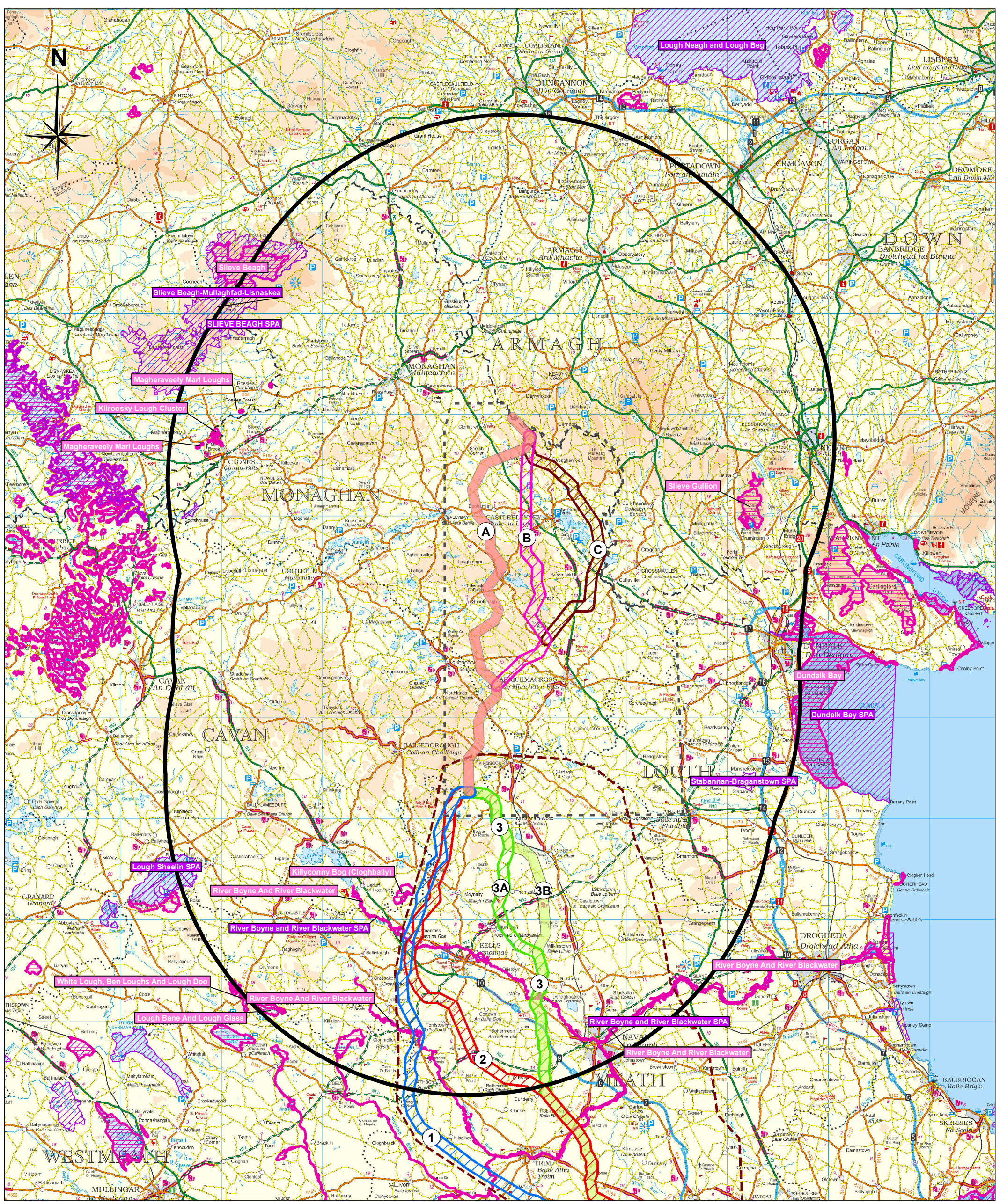
- 9 The proposed development comprises that portion of the proposed interconnector occurring within Ireland in counties Monaghan, Cavan and Meath. A full description of the proposed development is set out in section 4.2 below. While a number of European sites, comprised of candidate Special Conservation Areas (cSACs) and Special Protection Areas (SPAs) are located in the vicinity of the proposed development (see **Section 4.3** of this report), and the River Boyne and Blackwater cSAC/SPA is oversailed at two locations by the proposed development, no structures are located within any European sites. The initial identification of European sites in the study areas and potentially sensitive ecological receptors enabled a precautionary approach to be taken from route selection to final design for the proposed alignment, with the aim of avoiding, where possible, possible significant effects on the identified sites by routing all Route Corridor options, as far as possible, away from European sites and other identified sensitive ecological receptors.
- 10 The Route Corridor selection process considered 3 options in the CMSA (routes A, B and C) and 3 options in the MSA (routes 1, 2 and 3 (including two sub-options 3A and 3B)). **Figure 1.1 (CMSA)** and **Figure 1.2 (MSA)** indicate all route corridors, in each study area, in relation to European sites.
- 11 All Route Corridor options required crossing of the River Boyne and River Blackwater cSAC / SPA. Route Option 1 crossed the area of this site three times and Options 2 and 3 (the preferred option) crossed twice. All other European sites were avoided by all corridor options. In all cases, as is set out in **Section 6** below, suitable precautionary mitigation is proposed for inclusion in the assessment and will be implemented in the event that planning approval is granted, so as to make certain that the proposed development will not adversely affect the integrity of European sites.

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<sup>3</sup> [Kate Harrington, Roger Macnaughton (TOBIN Consulting Engineers) Dr. Patrick Crushell (Wetland Surveys Ireland)]

- 12 The final line design within the selected corridors (Option A in the CMSA and 3 / 3B in the MSA) was informed by the consideration of a number of technical, planning and environmental topics, including ecology, and involves two separate crossings of the River Boyne and River Blackwater cSAC and SPA, in circumstances where crossing of these rivers / sites cannot be avoided altogether. Potential impacts have been mitigated by ensuring that these European sites (which are riparian in nature) are merely oversailed by conductors at very narrow stretches where sensitive woodland type qualifying habitat is avoided, and that no structures are located or works will take place within any European site.





**Legend**

- Meath Study Area (MSA)
- Cavan Monaghan Study Area (CMSA)
- 30km buffer around line route

**MSA**

- Route Corridor 1
- Route Corridor 2
- Route Corridor 3A
- Route Corridor 3B

**CMSA**

- Route Corridor A
- Route Corridor B
- Route Corridor C
- Candidate Special Area of Conservation (cSAC)
- Special Protection Area (SPA)

Scale @ A3: 1:350,000

0 1 2 4 6 8 10 Kilometres

Issue	Date	Description	By	Chkd.
A	31.01.14	Issued	G.F.	R.McN.

**NOTES**

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- DISCOVERY SERIES TILES USED: OS2628, OS2828, OS3028, OS2826, OS2826, OS3026, OS2624, OS2824, OS3024
- ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
- DESIGNATED CONSERVATION AREAS DATA SOURCED FROM NPWS

Client: **EIRGRID**

Project: **NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT**

Title: **NATURA 2000 SITES MAP WITH ROUTE CORRIDOR OPTIONS**

Prepared by: G.Fil  
Checked: R.McN.  
Date: January 2014

Project Director: **Damien Grehan**

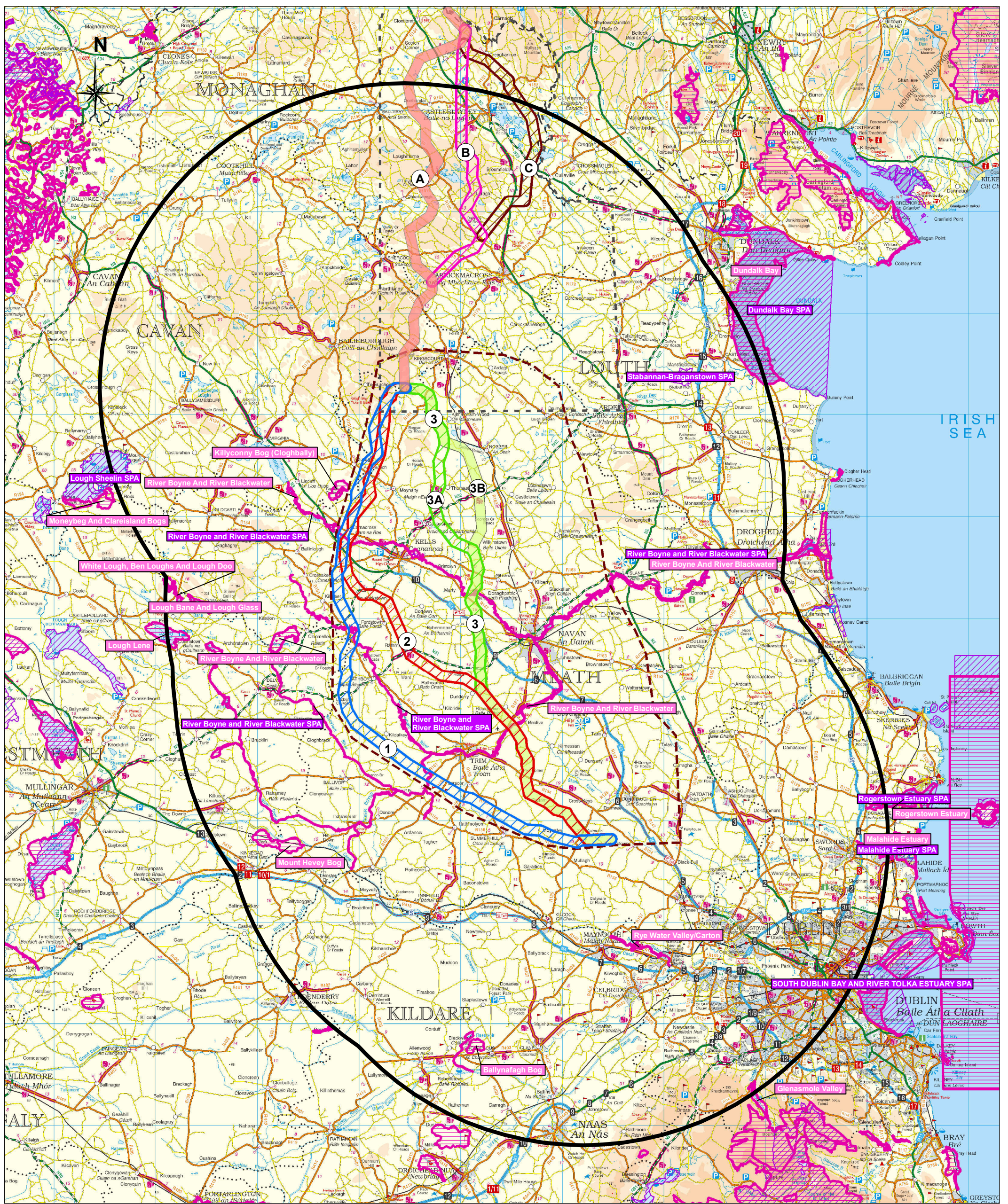
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Figure 1.1 (CMSA) A





**Legend**

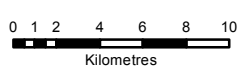
- Meath Study Area (MSA)
- Cavan Monaghan Study Area (CMSA)
- 30km buffer around line route
- MSA**
- Route Corridor 1
- Route Corridor 2
- Route Corridor 3A
- Route Corridor 3B

**CMSA**

- Route Corridor A
- Route Corridor B
- Route Corridor C

- Candidate Special Area of Conservation (cSAC)
- Special Protection Area (SPA)

Scale @ A3: 1:350,000



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 4. DESIGNATED CONSERVATION AREAS DATA SOURCED FROM NPWS

Client:

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Figure 1.2 (MSA) A



## 1.2 CONSULTATION

- 13 The lead project ecologist consulted directly with the Northern and Eastern Divisional Ecologists of NPWS in relation to the possible impacts of the project on ecological receptors including European sites. IFI was also consulted throughout each stage of the consideration of the proposed development and, in particular, regarding the River Boyne and River Blackwater and associated tributaries. Consultation meetings were also undertaken with BWI regarding wintering and breeding birds and areas / habitats utilised by protected species.
  
- 14 The pre-application consultation process highlighted particular sensitive areas and species to the team of project ecologists. These meetings confirmed that avoidance of designated areas was the primary mitigation approach. Thereafter, appropriate mitigation for possible indirect effects arising during the construction phase would be implemented regarding water pollution controls in agreement with IFI.

## 2 STATUTORY CONTEXT

- 1 The requirements for Appropriate Assessment (AA) are set out in Article 6 of the Habitats Directive (92/43/EEC) and Part XAB of the *Planning and Development Act 2000*, as amended [the 2000 Act].
- 2 The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest, and requires the creation of a coherent EU ecological network of designated Natura 2000 sites (e.g. SACs and SPAs) and a requirement to take the requisite measures to establish a system of protection for the habitats and species listed. The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national and international level.
- 3 The Habitats Directive outlines that habitats and species qualifying interests protected by the Directive must be maintained in 'favourable conservation status' within their range. The conservation status of qualifying interests will be taken as 'favourable' when:
  - Its natural range, and area it covers within that range, are stable or increasing;
  - The specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future; and
  - The conservation status of its typical species is favourable.
- 4 Favourable conservation status of a species (as defined in Article 1 of the Habitats Directive) is achieved when:
  - Population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats;
  - The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
  - There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

- 5 Neither the Habitats Directive nor Part XAB of the 2000 Act provide a stand-alone definition of an ‘Appropriate Assessment’. Moreover, there is no set form for an AA required under Article 6(3) as recognised by, the relevant guidance from the European Commission<sup>4</sup>. According to the Habitats Directive, an AA is required of the implications for the European site concerned of any plan or project not directly connected with or necessary to the management of that site but likely to have a significant effect thereon, either individually or in combination with any other plans or projects prior to its approval, and to take into account the cumulative effects which result from the combination of that plan or project with other plans or projects (in-combination effects) in view of the European site’s conservation objectives. European Sites include Special Areas of Conservation (SAC) designated under the Habitats Directive, Special Protection Areas (SPA) designated under the Birds Directive (2009/147/EEC) and candidate SACs (cSACs) or proposed SPAs (pSPAs), all of which are afforded the same level of protection as fully adopted sites. Both the Habitats and Birds Directives have been fully transposed into Irish law. The provisions of Part XAB of the 2000 Act require, *inter alia*, that an AA “*shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a... proposed development would adversely affect the integrity of a European site.*” It is such an Appropriate Assessment which the Board must conduct in relation to the proposed North–South 400kV Interconnection Development.

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<sup>4</sup> Office for Official Publications of the European Communities, Luxembourg (EC, 2001). *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitat Directive 92/43/EEC.*

### 3 GUIDANCE

- 1 This Natura Impact Statement (NIS) has been carried out in accordance with the following guidance:
- Department of the Environment, Heritage and Local Government (DoEHLG) (2009, as amended). *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities*;
  - Office for Official Publications of the European Communities, Luxembourg (EC, 2000). *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*;
  - Office for Official Publications of the European Communities, Luxembourg (EC, 2001). *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitat Directive 92/43/EEC*;
  - Office for Official Publications of the European Communities, Luxembourg (EC, 2007). *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission*;
  - EirGrid (2012). *Ecology Guidelines for Electricity Transmission Projects. A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Project*; and
  - National Roads Authority (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes*.
- 2 The assessment procedure is based on a four-stage approach, where the outcome at each successive stage determines whether a further stage in the process is required.

#### **Stage One: Screening**

- 3 The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives. There is no necessity to establish such an effect; it is merely necessary for An Bord Pleanála (the Board) to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of Appropriate Assessment (AA) has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded. The threshold at this first stage is a very low one and operates as a trigger in order to determine whether a Stage Two AA must be undertaken by the competent authority on the implications of the proposed development for

the conservation objectives of a European site. Therefore, where significant effects are likely, uncertain or unknown at screening stage, a second stage AA will be required. Screening determines whether AA is necessary by examining:

- 1) Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of the European site; and
- 2) The possible significant effects of a project or plan, either alone or in-combination with other projects or plans, on a European site in view of its conservation objectives, and considering whether these effects will be significant.

### **Stage Two: Appropriate Assessment**

4 The need for Stage Two AA arises where the first stage (or screening process) has either determined (or it was at least implicitly accepted) that the proposed development, alone or in-combination with other plans or projects, is likely to have a significant effect on a European site. Thus, a Stage Two AA is a focused and detailed examination, analysis and evaluation carried out by the competent authority (in this case, the Board) of the implications of the plan or project, alone and in-combination with other plans and projects, on the integrity of a European site in view of that site's conservation objectives. Case law has established that such an Appropriate Assessment, to be lawfully conducted, in summary:

- (i) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
- (ii) must contain complete, precise and definitive findings and conclusions and may not have *lacunae* or gaps; and
- (iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the Board decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete. If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, and then the process must proceed to stage three and, if necessary, stage four.

### **Stage Three: Assessment of Alternative Solutions**

5 This stage of the potential process arises where adverse effects on the integrity of a European site cannot be excluded and examines alternative ways of achieving the objectives of the project or plan

that avoid adverse impacts on the integrity of the European site. However, in circumstances where there will not be any adverse effects on any European site, the developer places no reliance upon this third stage of the process in the context of this application for approval for the proposed development.

#### **Stage Four: Imperative Reasons of Overriding Public Interest**

- 6 This is the derogation process of Article 6(4), which examines whether there are imperative reasons of overriding public interest [IROPI] for allowing a project to proceed where adverse effects on the integrity of a European site have been predicted. Compensatory measures must be proposed and assessed as part of this stage and the EU Commission must be informed of the compensatory measures. Again, EirGrid the developer places no reliance upon this stage of the process in the context of the application for approval for the proposed development.

## 4 STAGE ONE: SCREENING STAGE

### 4.1 INTRODUCTION

1 The project is not directly connected to, or necessary for, the management of any European site and, accordingly, the competent authority must undertake a Stage One screening assessment. To assist the competent authority in this regard, EirGrid has undertaken an exercise in Screening for Appropriate Assessment (AA) for this proposed development project based on the following:

- 1) Description of plan or project;
- 2) Identification of relevant European sites, and compilation of information on their qualifying interests and conservation objectives;
- 3) Assessment of likely significant effects – direct, indirect and cumulative – undertaken on the basis of available information; and
- 4) Screening conclusions.

### 4.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2 The proposed development comprises that portion of the proposed interconnector occurring within Ireland in counties Monaghan, Cavan and Meath. The proposed development, approximately 103.35km long, consists of the following principal elements:

- i. A new single circuit 400 kV overhead transmission line (covering a distance of approximately 100.5km in the counties of Monaghan, Cavan and Meath) extending in a generally southerly alignment from the jurisdictional border with Northern Ireland (between the townland of Doohat or Crossreagh, County Armagh, and the townland of Lemgare, County Monaghan) to the townland of Bogganstown (Electoral District (ED) Culmullin), County Meath. In addition the proposed transmission line crosses the jurisdictional border with Northern Ireland at two points - from the townland of Lemgare, County Monaghan into the townland of Crossbane, County Armagh and back into the townland of Lemgare, County Monaghan. This transmission line comprises 299 No. new lattice steel support structures (ranging in height from approximately 26m to 51m over ground level), with associated conductors, insulators, and other apparatus.
- ii. Modifications are required to three existing 110 kV overhead lines. The modifications comprise the insertion of additional polesets and / or replacement of existing structures with polesets of shorter height (ranging in height from approximately 11.5m to 19m over ground level) in the following locations:

- Where the proposed 400 kV overhead transmission line intersects with the Lisdrum–Louth 110 kV transmission line in Drumroosk, County Monaghan.
  - Where the proposed 400 kV overhead transmission line intersects with the Louth–Rathrussan 110 kV transmission line in Corrinenty and Corbane, County Monaghan.
  - Where the proposed 400 kV overhead transmission line intersects with the Arva–Navan 110 kV transmission line in Diméin Bhaile Ghib (Gibstown Demesne and Taitin (Teltown), County Meath.
- iii. The addition of a new 400 kV circuit for approximately 2.85km along the currently unused northern side of the existing Oldstreet to Woodland 400 kV transmission line, extending eastwards from the townland of Bogganstown (ED Culmullin) to the existing ESB Woodland 400 kV Substation, in the townland of Woodland, County Meath. The existing double circuit lattice steel support structures along this existing line range in height from approximately 52m to 61m over ground level.
- iii. Associated works on a site of approximately 0.544ha within and immediately adjacent to the existing ESB Woodland 400 kV Substation, in the townland of Woodland, County Meath to include: a western extension of the existing compound (of approximately 0.231ha) including associated modifications to the existing 2.6m high palisade boundary fence; the addition of electrical equipment and apparatus including circuit breaker, current transformers, inductive voltage transformers, disconnectors, pantograph disconnecting switches, surge arresters, support insulators and support insulator bars (all ranging in height from approximately 7.4m to 13.7m); gantry structures (approximately 28m); and a lightning monopole (approximately 28m); and all associated ancillary construction and site development works.
- iv. An associated temporary construction material storage yard to be located in the townlands of Monaltyduff and Monaltybane, Carrickmacross, County Monaghan, on a site of approximately 1.4ha, including associated site works, new site entrance onto the L4700 Local Road, associated 2.6m high boundary palisade fencing (with noise barrier affixed) and associated ancillary staff facilities and parking.
- v. All associated and ancillary development works including permanent and temporary construction and excavation works.

3 The two study areas are:

- **Cavan Monaghan Study Area (CMSA):** previously termed Cross Border Study Area (CBSA) in the application for planning approval of the Meath-Tyrone 400 kV Interconnection Development. The CMSA is primarily situated between the jurisdictional border with Northern Ireland to the north and the area of the existing Flagford-Louth 220 kV overhead transmission line (west of Kingscourt, County Cavan) to the south.

- **Meath Study Area (MSA):** previously termed North East Study Area (NESA) in the application for approval of the Meath-Tyrone 400 kV Interconnection Development. The MSA is situated on a generally north-south axis between the area of the Flagford-Louth 220 kV overhead transmission line (west of Kingscourt, County Cavan) in the north and the existing Woodland 400 kV Substation in County Meath in the south.

4 The proposed development located within these two study areas comprises the following:

- **CMSA – New 400 kV Line:** The proposed development in the CMSA comprises a single circuit 400 kV overhead transmission circuit supported by 134 towers (Tower 103 to Tower 236) extending generally southwards from the jurisdictional border with Northern Ireland (between the townland of Doohat or Crossreagh, County Armagh, and the townland of Lemgare, County Monaghan) to the townland of Clonturkan, County Cavan for a distance of approximately 46km. It includes lands traversed by the conductor from the jurisdictional border to Tower 103, and from Tower 103 to Tower 236 inclusive and lands traversed by the conductor strung from Tower 236 to Tower 237 (the first tower on the MSA section of the proposed development)<sup>5</sup>. It also includes modifications to existing 110 kV transmission overhead lines, and all associated and ancillary development works including permanent and temporary construction and excavation works.

The proposed development also comprises an associated temporary construction material storage yard to be located on a site of approximately 1.4ha in the townlands of Monaltyduff and Monaltybane, Carrickmacross, County Monaghan.

**MSA – New and Existing 400 kV Line:** The proposed development in the MSA comprises a new single circuit 400 kV overhead transmission circuit supported by 165 new towers (Tower 237 to Tower 401) extending for a distance of approximately 54.5km from Tower 237 in the townland of Clonturkan, County Cavan to Tower 402 (an existing double circuit tower on the Oldstreet to Woodland 400 kV transmission line) in the townland of Bogganstown (ED Culmullin), County Meath. It also includes modifications to an existing 110 kV transmission overhead line, and all associated and ancillary development works including permanent and temporary construction and excavation works.

The proposed development also comprises the addition of a new 400 kV circuit for some 2.85km along the currently unused (northern) side of the existing double circuit 400 kV overhead transmission line (the Oldstreet to Woodland 400 kV transmission line) extending eastwards from Tower 402 in the townland of Bogganstown (ED Culmullin), County Meath to Tower 410 and the Woodland Substation in the townland of Woodland, County Meath.

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<sup>5</sup> Between Tower 106 and Tower 107 the proposed transmission line crosses the jurisdictional border with Northern Ireland at two points - from the townland of Lemgare, County Monaghan into the townland of Crossbane, County Armagh and back into the townland of Lemgare, County Monaghan. This results in a section of the span between Tower 106 and Tower 107 oversailing Northern Ireland. The oversail section forms part of the SONI proposal.

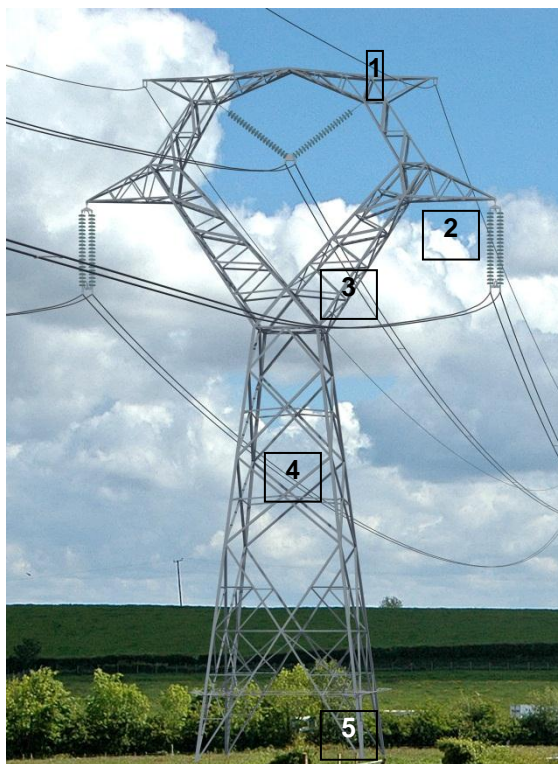
It also includes an extension to and works within the existing ESB Woodland Substation, in the townland of Woodland, County Meath

#### 4.2.1 Overhead Line Elements (OHL)

5 An Overhead Line (OHL) is made up of the following main elements:

- Steel lattice towers and associated foundations; and
- Conductors & shield wires (earth wires) and associated hardware (including insulators and fittings).

The general arrangement for the C-IVI-1 tower design (including conductors and associated infrastructure as described above) is illustrated in **Figure 4.1**



1. Earthed Shield wires
2. Insulators
3. Conductors
4. Tower
5. Concrete foundation for each tower footing

**Figure 4.1: General Arrangement of a C-IVI-1 (IVI) Tower**

6 The proposed development also includes modifications to the existing Lisdrum-Louth 110 kV, Louth-Rathrussan 110 kV and Arva-Navan 110 kV transmission OHLs. These advance modifications will be required to ensure that there is sufficient electrical safety clearances maintained between the 110 kV OHL and 400 kV conductor at the point of crossing. The modifications involve lowering the height of the existing 110 kV transmission lines, at the point of the crossing of the proposed 400 kV route. This will be achieved by the insertion of additional wood polesets and / or the replacement of existing structures with wood polesets that are lower in height, as follows:

- Where the proposed 400 kV overhead transmission line intersects with the Lisdrum–Louth 110 kV transmission line the insertion of two new polesets (approximately 14m and 16m high) is proposed. In addition an existing 17.7m high poleset will be replaced by a new poleset approximately 12m high.
- Where the proposed 400 kV overhead transmission line intersects with the Louth–Rathrussan 110 kV transmission line an existing 19.6m high lattice steel tower and an existing 19.7m high poleset will both be replaced by new polesets (both approximately 19m high).
- Where the proposed 400 kV overhead transmission line intersects with the Arva–Navan 110 kV transmission line two existing polesets (14.7m and 15.7m high) will be replaced by two new polesets (both approximately 14m high).

7 There are three types of tower proposed for this development. These are detailed below:

- i. Intermediate or suspension towers are used on straight sections of an alignment. Electricity conductors hang on, or are suspended from, the cross arms of these towers resulting in these towers being somewhat taller and slimmer than angle towers and typically requiring smaller foundations.
- ii. Angle / tension towers are so-called because the electricity conductors pull off the crossarms (i.e. connecting to the towers under tension). This requires the angle tower to have a greater mechanical strength than the intermediate tower. These towers are used at points when the OHL changes direction, where the line terminates, such as at substations (for example Tower 410 on the existing Oldstreet to Woodland OHL) or in order to break a long linear span. Angle towers use heavier steel members and can also be shorter than comparable intermediate towers (while still maintaining the same clearance between the ground and the electricity conductor). This gives the towers the appearance of being ‘stockier’ than the intermediate tower. Due to the required increase in mechanical strength, angle towers will also typically have much larger foundations than intermediate towers.
- iii. Transposition towers change the physical position of the conductors on a transmission line (known as phases) while maintaining electrical phase separation and clearance. Transposition phases can be important over long linear lengths as it balances the electrical impedance<sup>6</sup> between phases of a circuit. Analysis by EirGrid shows that the operating performance of the proposed interconnector will benefit from a single point of transposition. Transposition is the practice of transposing or rearranging the spatial arrangement of the three electricity wires or conductors that make up the three-phase circuit. The transposition takes place over four structures (the transposition alignment).

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<sup>6</sup> Electrical impedance is a measure of the opposition that a circuit presents to the passage of the electrical current as the length of the circuit increases.

- 8 Conductors are the wires that carry the electricity and comprise a number of conducting aluminium wires around a high-strength core consisting of steel wire. Each phase typically consists of a number of single conductors forming a conductor bundle. Generally, the higher the voltage level, the higher the number of conductors in the bundle. To achieve the required power capacity of the proposed interconnector, it will be necessary to install a pair of conductors per phase (known as a twin bundle). These conductors will be separated by spacers at regular intervals. For the proposed 400 kV OHL, the minimum conductor height above ground has been designed to 9m.
- 9 Earth / ground wire or shield wire and optical fibres (OPGW) are installed above the live conductors at the top of the tower to minimise the likelihood of direct lightning strikes to the conductors. Shield wires are also conductors but serve a different purpose to live conductors. Should lightning strike the line it will in all likelihood strike a shield wire rather than a live conductor (as they are installed above the live conductor). This will not necessarily prevent the line from tripping out but it will protect the line from being damaged by very quickly dissipating the energy in the lightning strike away from the line and into the ground. In such circumstances, if the line did trip out it can be restored automatically in less than a second. Shield wires may include OPGWs used in respect of controlling the power system and communication.
- 10 Insulators support the conductors and have to withstand both normal operating voltage and surges as a result of switching and lightning strikes. For transmission lines these tend to be suspended below the structure and comprise a number of glass or composite discs, the number of which increases for the higher voltages. The proposed insulator for the proposed development is the composite type. It is proposed to install earth wire marking in the form of bird flight diverters. The type of flight diverters recommended are swan flight diverter markers constructed from high impact grey PVC (UV stabilised) fitted approximately 5m apart along each earth wire. This line marking is proposed for the earth wires to increase visibility of the earth wires to flying birds. Locations where flight diverters are proposed are detailed in Section 6 of this report.

#### **4.2.2 Project Phases**

- 11 The site clearance works and construction of foundations were identified as the main source of potential ecological impacts. Other elements of the project which may give rise to possible significant effects on European sites include stringing of conductors, access to tower construction, operational stage maintenance / refurbishment (of towers and conductors) and decommissioning. The key phases of the project and a summary description of key works and related activities which require consideration regarding potential adverse effects to European sites are summarised below.

#### 4.2.2.1 Construction Phase

12 The following activities that will be undertaken during the construction phase at tower locations, the substation and the construction compound need to be given due consideration in the assessment of possible significant effects on European sites:

- Site clearance and any drainage requirements to facilitate construction;
- Excavations required for tower bases and for substation / compound works;
- Excavations required for guard pole structures<sup>7</sup>;
- The use of machinery and associated disturbance within the 'works area' during construction;
- All works associated with modifications to existing 110kV transmission OHL's;
- The use of concrete at each construction site;
- Management, storage and disposal of excavated material during the construction phase;
- Locations to be used by machinery during the stringing phase;
- Access routes to be used by machinery during construction; and
- Trimming and lopping of woody vegetation to facilitate clearance beneath the line between towers.

13 The works for each tower is contained within an area of approximately 900m<sup>2</sup>. The permanent direct impact for each tower varies depending on the tower type. Tower foundations typically range from 2m to 3.5m in depth to the invert level of the foundation and anywhere from 2 x 2 metres squared to 9 x 9 metres squared in plan area depending on tower type. Each of the four corners of the tower stubs (i.e. lower part of the tower leg) are separately anchored below ground in a block of concrete. The standard construction practice is to use a concrete pipe in the foundation holes, which is as an integral part of the foundation. Vegetation between tower foundations under each tower is cleared / disturbed during construction; however it can re-grow post construction.

14 The key possible significant construction phase effects identified as relevant to European sites include:

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<sup>7</sup> Where a conductor is to be strung over roads, protection known as guarding will be erected prior to the commencement of stringing operations.

- Pollution runoff potential effects on surface water quality through drains and other watercourses close to the works area, potentially linked to more ecologically important streams, rivers and lakes;
- Pollution runoff potential effects on to ground water quality in the vicinity of works area potentially linked to ground fed wetlands and other surface water features linked to European sites; and
- Disturbance impacts from vegetation clearance and associated disturbance at riparian areas linked to downstream European sites.

#### 4.2.2.2 Operation Phase

15 The following activities that will be undertaken during the operation phase which will require due consideration regarding protection of European sites conservation interests:

- Occasional tree trimming at riparian areas will be required beneath the alignment with regard to protection of qualifying interest fauna;
- Surface water protection measures during maintenance and occasional refurbishment of towers throughout the lifetime of the project; and
- Potential for collision with the OHL for sensitive bird species.

#### 4.2.2.3 Decommissioning Phase

16 The proposed development will become a permanent part of the transmission infrastructure. The expected lifespan of the proposed development is in the region of 50 to 80 years. This will be achieved by routine maintenance and replacement of hardware as required. There are no plans for the decommissioning of the OHL or existing substation. In the event that part of, or the entire, proposed infrastructure is to be decommissioned, all towers, equipment and material to be decommissioned will be removed off site and the land reinstated.

17 Specific decommissioning works would include:

- Fittings and / or hardware such as spacers dampers, and insulators would be removed from the circuit. The conductors would be winched onto drums in a reverse stringing process;
- The tower would be dismantled, with sections disconnected for removal from site; and
- Typically the foundations would be removed to approximately 1m deep and subsoil and topsoil reinstated.

- 18 The decommissioning of the proposed development, if it is to occur, would be undertaken many decades into the future. It is likely that the baseline conditions will have changed to a greater or lesser degree, however, it is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase. Similar mitigation measures as described in this NIS should be implemented to ensure the minimisation or elimination of any environmental impacts.

#### 4.2.3 Other Plans and Projects

- 19 In-combination or cumulative effects may arise from the impacts of other developments and plans in-combination with the proposed development and can include, but are not limited to, multiple effects of the same or similar type from a number of developments upon the same receptor / resource.

- 20 For this purpose, the categories of other developments included in the appraisal include:

- Permitted development with the potential for significant in-combination / cumulative effects with the proposed development (e.g. major linear infrastructure development, such as road proposals, windfarms or other Strategic Infrastructure Development (SID)); and
- Proposed developments with the potential for significant in-combination effects with the proposed development.

All permitted and proposed development which have been considered as part of the in-combination assessment are summarised in **Table 4.1**. In addition the proposed development crosses other existing distribution and telecommunications lines, works which have also been considered.

- 21 Where no possible significant effects of the proposed development 'alone' are identified then there is no potential for the proposed development to interact with other plans or projects to result in cumulative effects.

- 22 No plans with the potential for significant in-combination / cumulative effects with the proposed development were identified. The respective regional and county development plans promote sustainable development and include policies and objectives aimed at protecting the natural environment and implementing the requirements of the Habitats and Birds Directives.

- 23 The development plans for Meath, Cavan and Monaghan contain specific objectives for different development sectors such as agriculture, forestry, industry and the energy and extractive sectors. The Meath Landscape Character Assessment identifies and rates the capacity for wind energy. The proposed development lies within areas identified as low-medium capacity. The Monaghan Development plan does not include such a landscape capacity/sensitivity analysis, although Policy ERO 4 states that it is an objective to undertake such a process within the lifetime of the current plan. The Cavan County Development Plan does not mention landscape sensitivity/capacity with

regard to development types. Any proposed windfarm development projects are reviewed and considered herein.

- 24 Overarching these sectoral objectives are policies/objectives devised to ensure that all development is carried out with due consideration of the natural environment including protected European sites. Specific natural heritage objectives from each county plan are detailed below.

#### **Meath County Development Plan 2013-2019**

- 25 Objectives for Biodiversity and Natural Heritage:

- NH Objective 2: To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directive, and in accordance with the Department of Environment, Heritage and Local Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is carried out in respect of any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in combination with other plans or projects, in view of the site's conservation objectives.
- NH Objective 3: To protect and conserve the conservation value of candidate Special Areas of Conservation, Special Protection Areas, National Heritage Areas and proposed Natural Heritage Areas as identified by the Minister for the Department of Arts, Heritage and the Gaeltacht and any other sites that may be proposed for designation during the lifetime of this Plan.

#### **Monaghan County Development Plan 2013-2019**

- 26 Objectives for Biodiversity and Natural Heritage:

- BDO 3 Protect and enhance, plant and animal species and their habitats, which have been identified under the EU Habitats Directive, EU Birds Directive, the Wildlife Act and the Flora Protection Order.

- 27 Policies for the Protection of Designated Sites:

- DSP 1 Strictly protect areas designated or proposed to be designated as Natura 2000 sites (listed in Appendix 4). Development within or adjacent to these areas will only be permitted where it has been clearly demonstrated to the satisfaction of the planning

authority that such development will have no significant adverse effects on the conservation objectives or integrity of these sites in accordance with the Habitats Directive.

## 28 Policies for Appropriate Assessment:

- AAP 1 Ensure that all plans and projects in the County, not directly connected with or necessary to the management of a Natura 2000 site, but likely to have a significant effect, either directly or indirectly, on a Natura 2000 site, either alone or in-combination with other plans or projects, are subject to Appropriate Assessment Screening in accordance with Article 6 of the Habitats Directive.
- AAP 2 The Planning Authority shall fully implement the DEHLG guidance Appropriate Assessment of Plans and Projects in Ireland (2009) and any subsequent versions, when assessing plans and projects likely to have significant effects on a Natura 2000 site.
- AAP 3 All planning applications for development within, adjacent to, or with the potential to affect a Natura 2000 site must be accompanied with a Natura Impact Statement in accordance with the Habitats Directive. Natura Impact Statements submitted in support of proposals for development must be carried out by appropriately qualified professionals with any necessary survey work taking place in appropriate seasons.
- AAP 4 Consult the National Parks and Wildlife Service (NPWS), the Department of the Arts, Heritage and the Gaeltacht (DAHG), the Heritage Council and An Taisce when considering plans or projects which are likely to affect Natura 2000 sites.
- AAP 5 All plans within, adjacent to, or with the potential to affect a Natura 2000 site must be accompanied with a Natura Impact Report in accordance with the Habitats Directive.

### **Cavan County Development Plan 2014-2020**

## 29 Environmental Protection Objectives (EPOs):

- EPO1 Conserve designated habitats and protected species.
- EDP9 To require an EIS, as part of a planning application, where the thresholds outlined in Schedule 5 of the 'Planning and Development Regulations 2000', as amended are met. The Planning Authority will also exercise its powers under Section 103 (1) to require an EIS for sub-threshold development where it is considered that the development would be likely to have significant effects on the environment or heritage. Where a development proposal is likely to have a significant effect on a European site, an Appropriate Assessment will be

required. Appropriate mitigation measures and details of re-instatement after use must be included.

**Table 4.1: Permitted and Proposed Transmission, Major and SID Projects**

PLANNING APPLICATION REFERENCE	PLANNING AUTHORITY	NAME OF APPLICANT	DEVELOPMENT	ADDRESS OF THE PROPOSAL	DECISION / STATUS	DATE OF FINAL GRANT
02/2013/0214/F 02/2009/0792/F	Northern Ireland Planning Service	SONI	Construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of approximately 34km from a new substation at Turleenan, Co. Tyrone to a border crossing between the townlands of Doohat or Crossreagh, Co. Armagh and Lemgare, Co. Monaghan. <sup>8</sup>	County Armagh and Tyrone, Northern Ireland.	Planning Stage	N/A
09447	Cavan County Council	ESB Networks	To build a 38 kV OHL from existing Shercock 38 kV Station	Shinan, Shercock and across the townlands Lecks, Croley, Lisdrumskea, and to a point at Lisdrumfad, Shercock	Grant with conditions	22/07/2010
09561	Monaghan County Council	ESB Networks	To build a 38 kV OHL from existing Shercock 38 kV Station	Shinan, Shercock and across the townlands Lecks, Croley, Lisdrumskea, and to a point at Lisdrumfad, Shercock	Grant with conditions	23/06/2010
PL17.PA0013	Meath County Council	College Proteins	Biomass Combined Heat And Power (CHP) Plant	College Road, Nobber, County Meath	Grant with conditions	28/02/2013
PL25.VA0013	Westmeath County Council & Meath County Council	EirGrid	Proposed 110 kV Circuit From Mullingar 110 kV Station, Co. Westmeath to Kinnegad 110 kV Station at Killaskillen Townland, County Meath	County Westmeath and County Meath	Grant with conditions	10/01/2013
PL17.PA0026	Meath County Council	Indaver Ireland Limited	Amendments to existing Permissions for Waste Energy Plant	Carranstown, Duleek, County Meath	Grant with conditions	04/02/2013

<sup>8</sup> This development is part of the overall proposed interconnector

PLANNING APPLICATION REFERENCE	PLANNING AUTHORITY	NAME OF APPLICANT	DEVELOPMENT	ADDRESS OF THE PROPOSAL	DECISION / STATUS	DATE OF FINAL GRANT
10485, 12306, 13125, 13206 and 13207	Monaghan County Council	Gaeltech Energy Developments Ltd	<p>Reg. Ref. 10485: Construction of 8 no. wind turbines of hub height 70m (also referred to as the Old Mill Wind Farm in this report).</p> <p>Reg. Ref. 12306: Amendments to Reg. Ref. 10485.</p> <p>Reg. Ref. 13125: Single wind turbine with a hub height of 80m.</p> <p>Reg. Ref. 13206: 38 kV overhead line from a substation in Lisduff to a substation in Killycard, County Monaghan.</p> <p>Reg. Ref. 13207: new 38 /20 kV wind farm substation and associated works at Lisduff, County Monaghan.</p>	Townlands of Carrickatee, Tossy, Lisduff, Loughmourne, Corderrybane, Greagh, Drumlane, Drumguillew Upper, Shane, Tullycarragh, Derryisland, Monagar, Muldrumman, Tullyskerry and Killycard.	All granted with conditions	<p>Reg. Ref. 10485: 20/11/2011</p> <p>Reg. Ref. 12306: 27/11/2012</p> <p>Reg. Ref. 13125:17/07/2013</p> <p>Reg. Ref. 13206: 13/01/2014</p> <p>Reg. Ref. 13207: 30/09/2013</p>
O9/270 /PL02 .236608	Cavan County Council and An Bord Pleanála.	PWWP Developments Limited	Wind farm of up to seven turbines, anemometry mast, electrical substation, access tracks, underground cabling and ancillary works.	Raragh and Corrinshigo, Kingscourt, County Cavan.	Grant with conditions	15/11/2010
Ka / 120679	Meath County Council	SSE Renewables Ireland Ltd.	Five wind turbines of up to 80m hub height and up to 82.5m rotor diameter with a total tip height not exceeding 121.25m, a transformer and crane handstand area at each turbine, underground electrical and communication cables linking the turbines, internal site tracks, a permanent meteorological mast 80m high, drainage works, a substation and associated equipment and control building with a wastewater treatment system and associated works.	Teevurcher and Agheragh, Tierworker, Kells (see Figure 10.1, <b>Volume 3B</b> of the EIS).	Granted	06/06/2013

PLANNING APPLICATION REFERENCE	PLANNING AUTHORITY	NAME OF APPLICANT	DEVELOPMENT	ADDRESS OF THE PROPOSAL	DECISION / STATUS	DATE OF FINAL GRANT
PA0038	An Bord Pleanála	North Meath Windfarm Limited	Construction of 3 windfarm clusters comprising <i>inter alia</i> : a combined total of 46 no. wind turbines with a maximum tip height of up to 169 metres and associated turbine foundations, hardstanding areas and drainage; 1 meteorological mast (80 metres in height); a 110 kV substation; 6 no. borrow pits, new entrances and site tracks; cabling between turbines and on-site substation and the existing Gorman substation; and all associated site development works.  Details of the proposed development including an EIS are available at <a href="http://www.emlaghwindfarm.ie">www.emlaghwindfarm.ie</a> .	<b>County Meath</b> (north-east of Kells).  [It is located in the vicinity of the North South 400 kV Interconnector between Towers 282 and 295. Refer to Figure 10.2, <b>Volume 3B</b> of the EIS.]	An application for planning approval was lodged with An Bord Pleanála on 6 <sup>th</sup> October 2014.	
KA/140921 / PL17.244357	Meath County Council / An Bord Pleanála	Cregg Wind Farm Limited	10 year planning permission for the construction, operation and decommissioning of a wind farm of up to six no. wind turbine generators to export electricity to the national grid. Each turbine will be up to 150 metres to blade tip height with an associated crane hardstand. The works will also require the construction of an electrical substation, a meteorological mast, cabling and access tracks to each turbine and ancillary works including a temporary construction compound and site entrance access upgrades for abnormal loads.	Cregg, College and Rathgillen townlands, Nobber, County Meath.	Refused by Meath County Council. Decision due from An Bord Pleanála 19/5/2015	A decision is expected on 19/5/2015
PA00041	An Bord Pleanála	Element Power Ireland	Maighne Wind Farm consisting of up to 47 no. turbines in 5 no. clusters, 1 no. electricity substation and associated works. The turbine clusters will be connected to the grid via	North County Kildare and South County Meath.	The application was lodged on 9 <sup>th</sup> April	N/A

PLANNING APPLICATION REFERENCE	PLANNING AUTHORITY	NAME OF APPLICANT	DEVELOPMENT	ADDRESS OF THE PROPOSAL	DECISION / STATUS	DATE OF FINAL GRANT
			underground cables (38 kV) mostly along the public road. Two connection options to the national grid are proposed – one at Woodland Substation (County Meath) and the other at Maynooth Substation, County Kildare).		2015	
N/A	N/A	National Transport Authority	Phase II of the Dublin to Navan rail link. The Railway Order was substantially complete but was deferred by the Infrastructure and Capital Investment 2012–2016 Medium Term Exchequer Framework (November 2011).	Dublin to Navan rail link	On hold	N/A
N/A	N/A	NRA	Leinster Orbital Route (LOR) - in the vicinity of Trim.	Feasibility / On hold		
N/A	Cavan and Meath County Council	NRA	The improvement / replacement of a section of the N3.	From a location south of the Cavan / Meath County boundary (in the townland of Derver, County Meath), to an appropriate location on the existing network between the townlands of Thomas Court or Drumroosk and Kilnaleck, Butlersbridge County Cavan, a potential distance of 46km	Suspended	N/A
N/A	Louth and Meath County Council	NRA	The N52 Ardee bypass consists of 4.48km of reduced single carriageway roadway and commences to the west of Ardee running east to the N2 road North of Ardee. The scheme includes two river crossings of the River Dee and River Garra, a staggered junction at Silver Hill road and a T-junction with	North of Ardee, County Louth	Planning Stage	N/A

PLANNING APPLICATION REFERENCE	PLANNING AUTHORITY	NAME OF APPLICANT	DEVELOPMENT	ADDRESS OF THE PROPOSAL	DECISION / STATUS	DATE OF FINAL GRANT
			the Mullinstown Road.			
N/A	Monaghan County Council	NRA	Upgrade approximately 28km of the N2 in north County Monaghan between the village of Clontibret and the border of County Tyrone.	Clontibret to the border of County Tyrone.	Suspended	N/A

#### 4.3 IDENTIFICATION OF RELEVANT EUROPEAN SITES AND COMPILATION OF INFORMATION ON THEIR QUALIFYING INTERESTS AND CONSERVATION OBJECTIVES

30 To determine which European sites require to be considered in the context of the proposed development for the purposes of Screening for AA, a review of all European sites within 30km of the overall project study area was undertaken. Given the long linear nature of the project and the presence of mobile species such as wintering birds, it is considered that a 30km buffer adequately encompasses all European sites requiring consideration regarding potential connections to the study area and the proposed development. Based on this review the following European Sites and qualifying interests were considered for Screening for AA:

- Whooper Swan was identified as a species of concern in early consultation, therefore all SPAs within 30km of the study area where Whooper Swan is a qualifying species were included in this screening assessment to examine the potential for connections to populations within the study area.
- European Sites within the same river catchment of the proposed development, within 30km of the study area.
- Several SPAs located greater than 30km from the study area were included (i.e. Lough Oughter & Associated Loughs SPA, Lough Swilly SPA, Lough Foyle SPA and Lough Neagh & Lough Beg SPA) as Whooper Swan is a qualifying interest for these sites and migratory movements are known to occur between these sites, principally from the 'staging sites' at Lough Foyle and Lough Swilly to sites further south in Autumn with a return migration in Spring. In addition irregular movements of small numbers of birds may also occur (Robinson *et al*, 2004)<sup>9</sup>.
- All other cSACs and SPAs within 15km of the study area (following recommended distance in NPWS (2009) Appropriate Assessment Guidance).

31 The list of relevant European sites and their qualifying interests are detailed in **Table 4.2**.

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<sup>9</sup> Robinson, JA; Colhoun, K; McElwaine, JG & EC Rees. 2004. *Whooper Swan Cygnus Cygnus (Iceland population) in Britain and Ireland 1960/61 – 1999/2000*. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge.

**Table 4.2: European Sites Considered for Screening for Appropriate Assessment (AA)**

European Site	Possible Connections to the study area	Qualifying Interests
River Boyne and River Blackwater cSAC (Site Code: IE002299)	The proposed development oversails two stretches of the cSAC. The construction of support towers are required at either side of the River channels (outside the boundary of the cSAC).	River Lamprey ( <i>Lampetra fluviatilis</i> ) [1099], Salmon ( <i>Salmo salar</i> ) (only in fresh water) [1106], Otter ( <i>Lutra lutra</i> ) [1355], Alkaline fens [7230], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0].
River Boyne and River Blackwater SPA (Site Code: IE004232)	The proposed development oversails two stretches of the SPA. The construction of support towers are required at either side of the River channels (outside the boundary of the cSAC).	Kingfisher ( <i>Alcedo atthis</i> ) [A229] breeding
Killyconny Bog (Cloghbally) cSAC (Site Code: IE000006)	The cSAC is within 15km of proposed development.	Active raised bogs [7110] and Degraded raised bogs still capable of natural regeneration [7120].
Rye Water and Carton cSAC (Site Code: IE001398)	The cSAC is within 15km of proposed development.	<i>Vertigo angustior</i> [1014], <i>Vertigo moulinsiana</i> [1016], and Petrifying springs with tufa formation ( <i>Cratoneurion</i> ) [7220].
Strabannan-Braganstown SPA (Site Code: IE004091)	Potential wintering bird movements between SPA and location of the proposed development considered.	Greylag Goose ( <i>Anser anser</i> ) [A043]
Boyne Coast and Estuary SPA (Site Code: IE004080)	Potential wintering bird movements between SPA and location of the proposed development considered.	Wintering waterbirds and wetlands including the following species recorded in the study area; Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] and Lapwing ( <i>Vanellus vanellus</i> ) [A142].
Boyne Coast and Estuary cSAC (Site Code: IE001957)	The proposed development is within the River Boyne catchment thus connecting watercourses may provide a possible hydrological link to the cSAC.	<i>Salicornia</i> and other annuals colonising mud and sand [1310], Atlantic salt meadows ( <i>Glaucopuccinellietalia maritima</i> ) (ASM) [1330], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) (MSM) [1410], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with

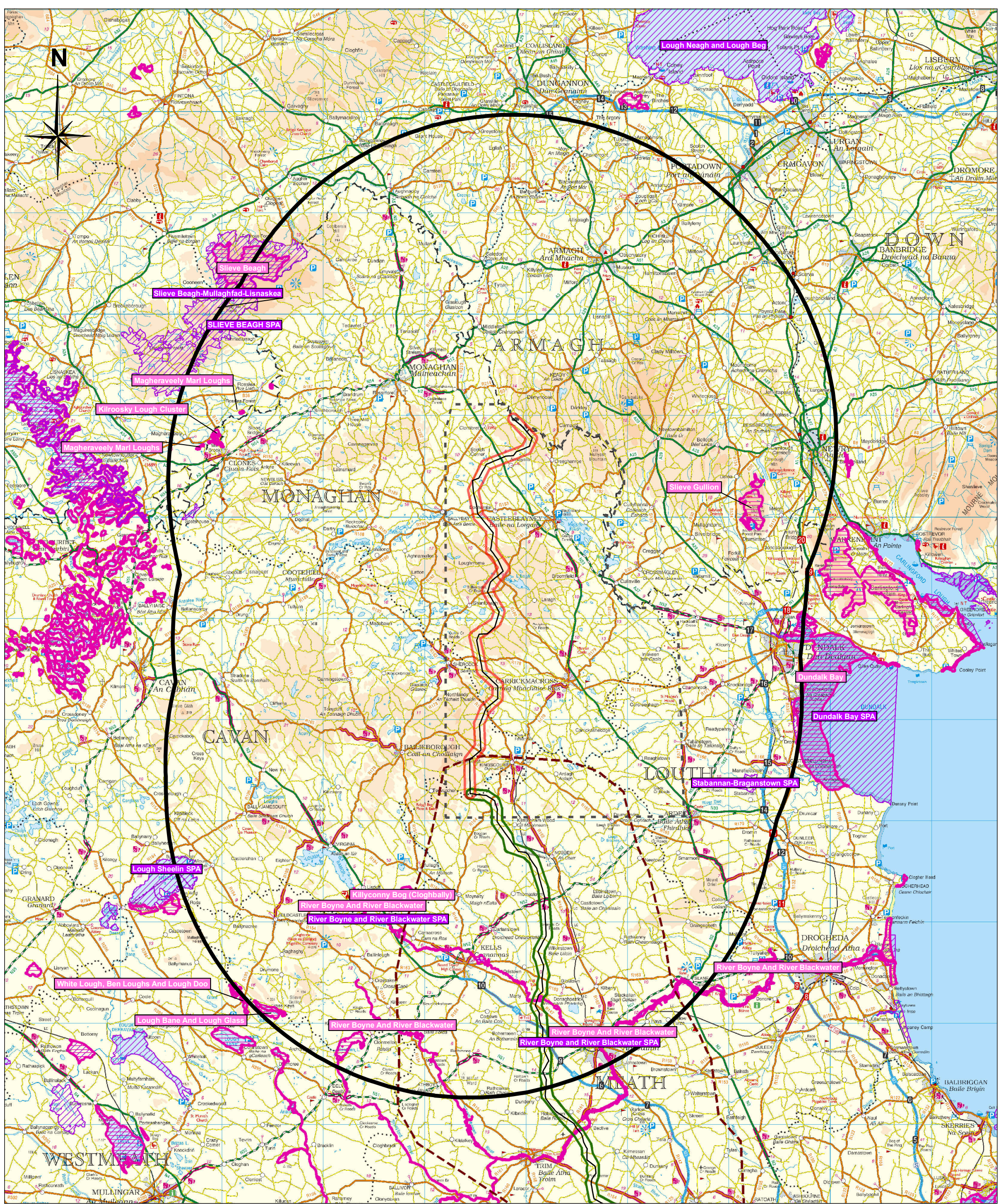
European Site	Possible Connections to the study area	Qualifying Interests
		<p><i>Ammophila arenaria</i> (white dunes) [2120], and</p> <p>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130].</p>
Dundalk Bay SPA (Site Code: IE004026)	Potential wintering bird movements between SPA and location of the proposed development considered.	Wetlands and wintering Waterbirds including the following species common to specific locations of the study area; Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Teal ( <i>Anas crecca</i> ) [A052], Mallard ( <i>Anas platyrhynchos</i> ) [A053], Lapwing ( <i>Vanellus vanellus</i> ) [A142] and Curlew ( <i>Numenius arquata</i> ) [A160].
Dundalk Bay cSAC (Site Code: IE000455)	The proposed development is within the River Boyne catchment, thus connecting watercourses may provide a hydrological link, hence linkage to possible effects of the proposed development considered.	<p>Estuaries [1130],</p> <p>Mudflats and sandflats not covered by seawater at low tide [1140],</p> <p>Perennial vegetation of stony banks [1220],</p> <p><i>Salicornia</i> and other annuals colonizing mud and sand [1310],</p> <p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330], and</p> <p>Mediterranean salt meadows (<i>Juncetalia maritim</i>) [1410].</p>
Slieve Beagh SPA (Site Code: IE004167)	Habitats close to the proposed development are potentially suitable for wintering Hen Harrier dispersing from the SPA.	Hen Harrier ( <i>Circus cyaneus</i> ) [A082] breeding
Lough Oughter and Associated Loughs SPA (Site Code: IE004049)	Potential wintering bird (qualifying interest of SPA) movements between SPA and location of the proposed development considered.	Wetlands and wintering Waterbirds including the following species common to the study area: Whooper Swan ( <i>Cygnus cygnus</i> ) [A043], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], and Wigeon ( <i>Anas penelope</i> ) [A050].
Upper Lough Erne SPA (Site Code: UK9020071)	Potential wintering bird (qualifying interest of SPA) movements between SPA and location of the proposed development considered.	<p>Breeding bird assemblage including the following species common to the study area: Great Crested grebe (<i>Podiceps cristatus</i>) [A005], Curlew (<i>Numenius arquata</i>) [A160] and Snipe (<i>Gallinago gallinago</i>).</p> <p>Wetlands and wintering Waterbirds including</p>

European Site	Possible Connections to the study area	Qualifying Interests
		the following species recorded from the study area: Whooper Swan ( <i>Cygnus cygnus</i> ) [A043], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Mute Swan ( <i>Cygnus olor</i> ), Wigeon ( <i>Anas penelope</i> ) [A050], Teal ( <i>Anas crecca</i> ) [A052], Coot ( <i>Fulica atra</i> ) [A125], Mallard ( <i>Anas platyrhynchos</i> ) [A053], Snipe ( <i>Gallinago gallinago</i> ) and Curlew ( <i>Numenius arquata</i> ) [A160]
Slieve Beagh – Mullaghfad-Lisnaskea SPA (Site Code: UK0016622)	Habitats close to the proposed development are potentially suitable for wintering Hen Harrier dispersing from the SPA.	Hen Harrier ( <i>Circus cyaneus</i> ) [A082] breeding
Lough Neagh and Lough Beg SPA (Site Code: UK9020091)	Potential wintering bird (qualifying interest of SPA) movements between SPA and location of the proposed development considered.	Breeding bird assemblage including breeding Common Tern ( <i>Sterna hirundo</i> ) [A193].  Wintering waterfowl assemblage including the following species common to the study area: Whooper Swan ( <i>Cygnus cygnus</i> ) [A043], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Mute Swan ( <i>Cygnus olor</i> ), Greylag Goose ( <i>Anser anser</i> ) [A043], Wigeon ( <i>Anas Penelope</i> ) [A050], Teal ( <i>Anas crecca</i> ) [A052], Mallard ( <i>Anas platyrhynchos</i> ) [A053] and Coot ( <i>Fulica atra</i> ) [A125].
Lough Foyle SPA (Site Code: IE004087)	Potential wintering bird (qualifying interest of SPA) movements between SPA and location of the proposed development considered.	Wintering waterfowl assemblage including the following species common to the study area: Whooper Swan ( <i>Cygnus cygnus</i> ) [A043], Great Crested grebe ( <i>Podiceps cristatus</i> ) [A005], Greylag Goose, ( <i>Anser anser</i> ) [A043], Wigeon ( <i>Anas Penelope</i> ) [A050], Teal ( <i>Anas crecca</i> ) [A052], Mallard ( <i>Anas platyrhynchos</i> ) [A053], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Lapwing ( <i>Vanellus vanellus</i> ) [A142], and Curlew ( <i>Numenius arquata</i> ) [A160].
Lough Swilly SPA	Potential wintering bird (qualifying	Wintering waterfowl assemblage including

European Site	Possible Connections to the study area	Qualifying Interests
(Site Code: IE004075)	interest of SPA) movements between SPA and location of the proposed development considered.	the following species common to the study area: Whooper Swan ( <i>Cygnus cygnus</i> ) [A043], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Greylag goose ( <i>Anser anser</i> ) [A043], Grey Heron ( <i>Ardea cinerea</i> ) [A028], Wigeon ( <i>Anas Penelope</i> ) [A050], Teal ( <i>Anas crecca</i> ) [A052], Mallard ( <i>Anas platyrhynchos</i> ) [A053], Coot ( <i>Fulica atra</i> ) [A125] and Curlew ( <i>Numenius arquata</i> ) [A160].

- 32 Designated European sites (referred to as Natura 2000 sites) are detailed in **Figure 4.2** CMSA Natura 2000 Sites Map and **Figure 4.3** MSA Natura 2000 Sites Map.

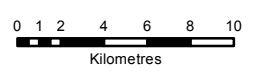




**Legend**

- Meath Study Area (MSA)
- Cavan Monaghan Study Area (CMSA)
- Route Corridor (CMSA)
- Route Corridor (MSA)
- 30km buffer around line route
- Candidate Special Area of Conservation (cSAC)
- Special Protection Area (SPA)

Scale @ A3: 1:350,000



Issue	Date	Description	By	Chkd.
B	DEC 2014	Issued	G.F.	O.M.A.
A	JAN 2014	Issued	G.F.	R.M.N.

**NOTES**  
 1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING  
 2. DISCOVERY SERIES TILES USED: OS2628, OS2828, OS3028, OS2826, OS2826, OS3026, OS2624, OS2824, OS3024  
 3. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD  
 4. DESIGNATED CONSERVATION AREAS DATA SOURCED FROM NPWS



Client: EIRGRID  
 Project: NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT

Title: NATURA 2000 SITES MAP WITH PREFERRED ROUTE CORRIDOR OPTION

Prepared by: G.Fil  
 Checked: O.McAister  
 Date: December 2014

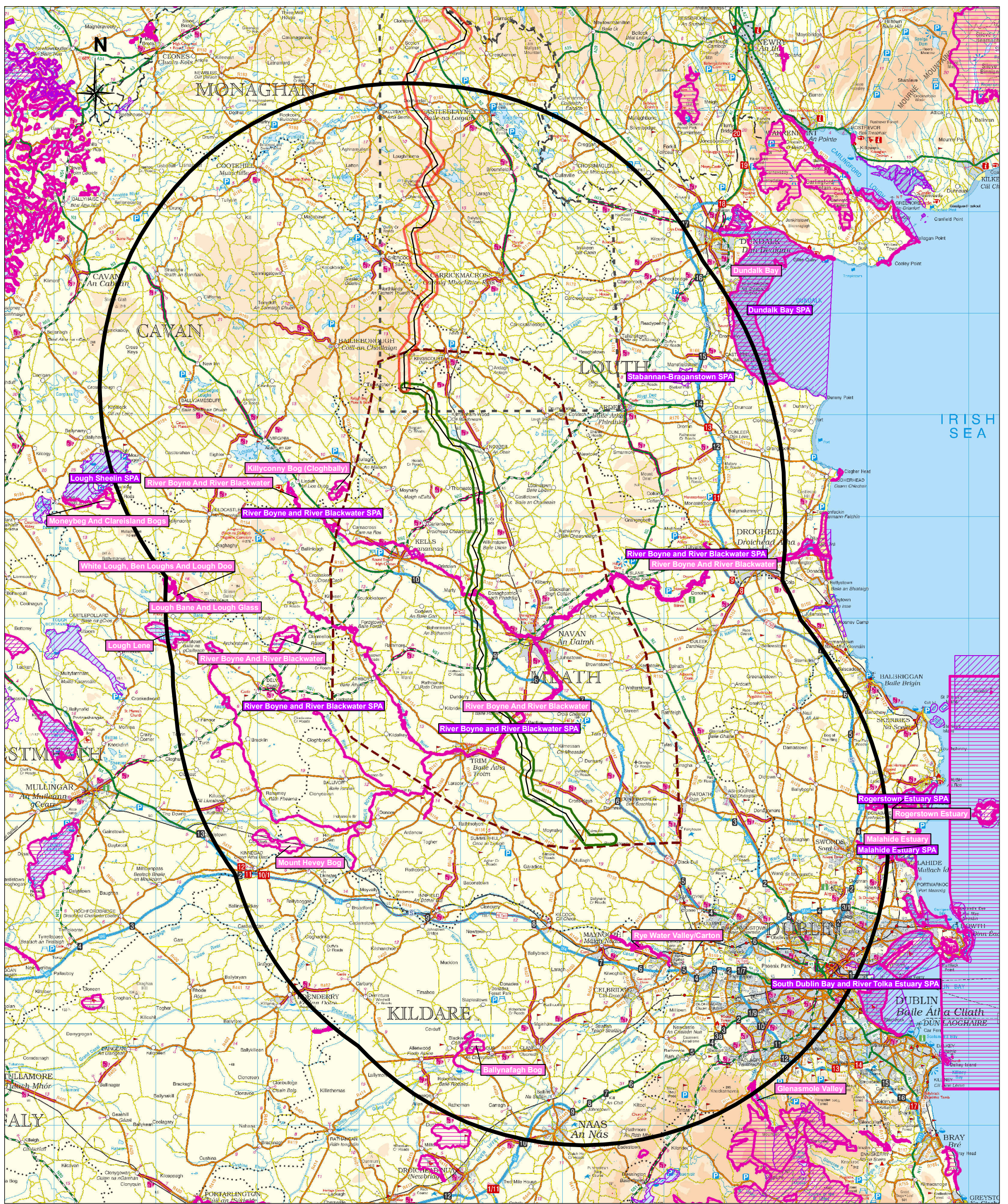
Project Director: Damien Grehan



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Figure 4.2 (CMSA) B





- Legend**
- Meath Study Area (MSA)
  - Cavan Monaghan Study Area (CMSA)
  - Route Corridor (CMSA)
  - Route Corridor (MSA)
  - 30km buffer around line route
  - Candidate Special Area of Conservation (cSAC)
  - Special Protection Area (SPA)

Scale @ A3: 1:350,000

0 2 4 6 8 10  
Kilometres

Issue	Date	Description	By	Chkd.
B	DEC 2014	Issued	G.F.	O.McA.
A	JAN 2014	Issued	G.F.	R.McN.

- NOTES**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  - DISCOVERY SERIES TILES USED: OS2628, OS2828, OS3028, OS2626, OS2826, OS3026, OS2624, OS2824, OS3024
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Figure 4.3 (MSA) B



33 To determine if the development could result in any likely significant effects on any of the European sites in view of their conservation objectives, the following process was undertaken:

- 1) All European sites were examined regarding their location with respect to the development using the NPWS Mapviewer<sup>10</sup> and GIS mapping produced for the proposed development, which displays all European site boundaries relative to the development. The conservation objectives and qualifying interests, together with supporting documentation, were carefully reviewed. No management plans are currently available for any of the European sites detailed. It was then considered whether possible significant effects on these European sites could arise taking into consideration the characteristics of the proposed development.
- 2) The qualifying interests (i.e. habitats / species) for all European sites detailed were reviewed and any possible connections (e.g. via surface and groundwater) to effects of the development were identified and assessed. The conservation status of species and habitats has been taken into account based on recent NPWS (2013) status assessments<sup>11</sup>. Key sensitive habitats within identified European sites include wetland habitats such as raised bog, lakes, rivers and fens. Key sensitive species<sup>12</sup> at unfavourable conservation status include marsh fritillary, three *Vertigo* (whorl snail) species, and freshwater pearl mussel. Species at more favourable conservation status including otter were also considered.

34 Additional considerations and information gathering exercises informed the screening appraisal including:

- Understanding that a best practice approach is being implemented for design / construction; and
- Extensive desk study, consultation (with statutory authorities (including NPWS and BWI) and findings of extensive multi-year ecological field surveys. In particular, 7 years of winter bird studies and four years of breeding bird studies have been conducted. These studies provided the robust data required to establish bird usage within study area and to inform the assessment in terms of determining the likelihood of movements of these birds outside of the study area thereby assessing possible connectivity with remote SPA sites. Guidance prepared by Scottish Natural Heritage (SNH) *Assessing connectivity with Special Protection Areas* (2013) was also used to inform this process.

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<sup>10</sup> <http://webgis.npws.ie/npwsviewer/>

<sup>11</sup> NPWS (2013). *The Status of EU Protected Habitats and Species in Ireland*. Habitat Assessments Volume 2. Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

<sup>12</sup> NPWS (2013). *The Status of EU Protected Habitats and Species in Ireland*. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

35 The purpose of the screening process is to identify European sites on which there is the possibility of there being a significant effect from the proposed development. It follows that the possibility of there being a significant effect on any European site will generate the need for a Stage Two Appropriate Assessment for the purposes of Article 6(3) of the Habitats Directive. As a corollary, European sites upon which the proposed development will have no appreciable effect are excluded from the requirements of a Stage Two AA. The results of the AA screening are summarised in **Table 4.3**.

#### 4.4 EVALUATION OF LIKELY SIGNIFICANT EFFECTS

36 Possible effects arising from a high voltage overhead transmission line development in the context of the conservation objectives of European sites included in the Screening for AA may include the following:

- Direct impacts (loss / damage) to qualifying habitats associated with the construction of support towers, guard pole structures, the use of temporary access routes, and possibly stringing areas. Typical impacts may include habitat loss / degradation and / or changes to qualifying habitat species composition.
- Indirect impacts (loss / damage) to qualifying habitats associated with the construction of support towers, guard pole structures, the use of temporary access routes and possibly stringing areas. Typical impacts include habitat degradation and / or changes to qualifying habitat species composition.
- Indirect impacts such as potential for water pollution during the construction and decommissioning phases such as increased siltation or contamination by fuel or other harmful substances. The potential for pollution increases significantly in sensitive habitats / soils e.g. peat land habitats and in particular in upland areas with high concentrations of small streams linked to or included in European sites.
- Possible impacts to groundwater flows linked to designated wetland sites caused by construction activities.
- Fragmentation of non-designated habitats linked to similar qualifying habitat in a designated area.
- Disturbance / displacement of qualifying species in and outside European sites linked to these sites e.g. wintering and breeding birds and otter.
- Introduction of non-native / invasive species or creation of conditions that allow the spread of non-native / invasive e.g. through soil disturbance.

- Potential mortality of individual birds of qualifying species through collision with the overhead line element (conductors or earthwire) of the transmission line.
- Displacement of birds from the general area of the transmission line.
- Direct disturbance to species and habitats during management / maintenance.

37 The screening appraisal for the proposed development is detailed in **Table 4.3**. All qualifying interests of European sites detailed are considered. In addition, for features where a possible link occurs outside of sites, such as for mobile species or connecting watercourses, possible effects from the development are examined in terms of significance of those effects in view of the conservation objectives. This assessment considers both the possible significant impacts from the project alone, and in-combination with other projects. For SPAs, qualifying interests considered as sensitive are those which were recorded in the study area, and that are categorised as highly or moderately collision prone following EirGrid (2012)<sup>13</sup>.

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<sup>13</sup> EirGrid (February 2012). *Ecology Guidelines for Electricity Transmission Project – A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects*. Available: <http://www.eirgrid.com>.

**Table 4.3: Summary of Screening for Appropriate Assessment**

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Progress To Stage 2 Of AA Process)
River Boyne and River Blackwater cSAC  (Site Code: IE002299)	Oversailed by conductors	River Lamprey  Salmon  Otter	<p>The construction of towers outside the boundaries of the European sites but adjacent to the River Boyne and River Blackwater and their tributaries may give rise to localised water quality impacts associated with site access, ground excavations and construction work (including works to existing 110kv transmission lines being crossed by the proposed 400kV line and decommissioning). In the absence of mitigation, increased siltation loads or pollution events could possibly result in temporary adverse effects on the aquatic species (and their habitats) for which the cSAC is designated.</p> <p>There is also the potential for disturbance of otter breeding or resting sites by activities associated with tree cutting under the conductors along smaller (undesignated) streams linked to the main river (European site).</p> <p>The operation of the transmission line is not likely to give rise to any appreciable effects on the conservation objectives of the cSAC, however, maintenance activities adjacent to the cSAC must be considered for potential effects.</p> <p>As the possibility for impacts to the conservation objectives of the cSAC have been identified, the development will be examined in-combination with other plans and projects.</p> <p>Due to the possibility of significant effects arising during the construction phase, this cSAC will be brought forward for Stage Two assessment of impacts on the integrity of site.</p> <p>Potential in-combination impacts with other developments have been identified, particularly at the construction stage with Teevurcher Wind Farm and North Meath Wind Farm. These will be considered as part of Stage 2 of the NIS.</p>	Yes

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Progress To Stage 2 Of AA Process)
River Boyne and River Blackwater SPA  (Site Code: IE004232)	Oversailed by conductors	Kingfisher	<p>The construction of towers outside the boundaries of the European site but adjacent to the River Boyne and its tributaries may give rise to localised water quality impacts and increased disturbance levels associated with site access, ground excavations and construction work (including works to existing 110kv transmission lines being crossed by the proposed 400kv line and decommissioning) in the absence of mitigation. Increased siltation loads or pollution events could possibly result in temporary adverse effects on the aquatic species (and their habitats) for which the SPA is designated. This could have potential knock-on effects for Kingfisher in terms of localised prey availability.</p> <p>There is potential for disturbance to Kingfisher nesting sites (within river banks) associated with tree cutting along non designated streams linked to the SPA (main river channel). No disturbance effects are expected along the main SPA river channel (River Boyne and Blackwater) as no instream works, tree cutting or other potential disturbance activities are proposed.</p> <p>As the possibility for impacts to the conservation objective of the SPA has been identified, the development will be examined in-combination with other plans and projects. Possible in-combination effects with Teevurcher Wind Farm and North Meath Wind Farm will be considered as part of Stage 2 of the NIS.</p> <p>Due to the possibility of significant effects arising during the construction phase, this SPA will be brought forward for Stage Two assessment.</p>	Yes
Rye Water and Carton cSAC  (Site Code: IE001398)	9.7km	None	<p>No hydrological connection exists between the study area of the proposed development and this European site. This site is outside of the zone of influence of any effects of the development.</p> <p>No direct or indirect effects will arise as a result of the proposed development alone or in-combination with other plans or projects.</p>	No
Killyconny Bog (Cloghbally) cSAC  (Site Code: IE000006)	10.7km	None	<p>No hydrological connection exists between the study area of the proposed development and this European site. This site is outside of the zone of influence of any effects of the development.</p> <p>No direct or indirect effects will arise to this bog cSAC as a result of the proposed development alone or in-combination with other plans or projects.</p>	No

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Progress To Stage 2 Of AA Process)
Strabannan-Braganstown SPA  (Site Code: IE004091)	24km	Greylag Geese	<p>Most recent evidence on the foraging distances of Greylag Geese during the winter season indicates that a core range of 15-20km should be considered in determining possible connections with SPAs for this species (SNH, 2013).</p> <p>This SPA is remote from the study area being over 24km distant.</p> <p>During the course of consultation on this proposed development, this species was not identified as a key species of concern due to its low abundance in the study area.</p> <p>There is a very low incidence of this species occurring in the general study area. Over the course of 7 years of winter bird survey, only 4 individual Greylag Geese were recorded on 3 occasions within the study area of the proposed development. Data collected during IWebs survey (BWI) within the study area shows no records of this species (2008-2013).</p> <p>Given the distance of the SPA from the study area (of the proposed development) and the very low (random) incidence of Greylag Geese occurring within the study area, it can be concluded that there is no appreciable connection to the Strabannan-Braganstown SPA.</p> <p>No direct or indirect effects are predicted for Greylag Geese associated with this SPA as a result of the proposed development. There is no possibility of there being a significant effect on this European site as a result of the proposed development alone or in-combination with other plans or projects.</p>	No
Slieve Beagh SPA  (Site Code: IE004167)	25km	Hen Harrier	<p>This SPA for breeding Hen Harrier is located at a distance beyond which is considered the maximum range of this species during the breeding season (maximum range of 10km (SNH, 2013)).</p> <p>There was just one record of a foraging Hen Harrier during the course of bird surveys conducted for the proposed development (winter observation 2km from the proposed development). This was located away from the vicinity of the proposed alignment. No winter roost sites or breeding sites were recorded or are likely to occur in the study area.</p> <p>There is no feasible connection between the area of the proposed development and this SPA for Hen Harrier. There is no possibility of significant direct or indirect effects arising on this site from the proposed development alone or in-combination with other plans or projects.</p>	No
Slieve Beagh -Mullaghfad-Lisnaskea	25km	Hen Harrier	<p>This SPA for breeding Hen Harrier is located at a distance beyond which is considered the maximum range of this species during the breeding season (maximum range of 10km (SNH, 2013)).</p>	No

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Progress To Stage 2 Of AA Process)
SPA (Site Code: UK0016622)			<p>There was just one record of a foraging Hen Harrier during the course of bird surveys conducted for the proposed development (winter observation). This was located away from the vicinity of the proposed alignment. No winter roost sites or breeding sites were recorded or are likely to occur in the study area.</p> <p>There is no feasible connection between the area of the proposed development and this SPA for Hen Harrier. No significant direct or indirect effects on this European site will arise from the proposed development alone or in-combination with other plans or projects.</p>	
Upper Lough Erne SPA (Site Code: UK9020071)	27km	Whooper Swan Great Crested Grebe Wigeon Cormorant Teal Coot Mallard Curlew Golden Plover Mute Swan Snipe	<p><b>Whooper Swan</b></p> <p>Whooper Swan are common to the study area and this SPA. This SPA is also known to be a possible staging site for returning migrants in spring, and migrants from the study area may use this staging site. The potential effects of the proposed development on this SPA population will therefore be examined in more detail in the NIS, by way of Stage Two evaluation.</p> <p><b>Other Species</b></p> <p>The breeding Great Crested Grebe population of Upper Lough Erne SPA have been considered as they also breed in low numbers in the study area. Great Crested Grebe are largely absent in the study area during the winter when they migrate mainly to coastal areas. They typically return in early March to medium sized and larger lakes scattered throughout the study area to breed. These individuals are highly sedentary during the breeding season and do not conduct regular flightlines.</p> <p>There was no evidence of connectivity (flightlines, tagged birds) between the Great Crested Grebe recorded in the study area and any other SPA during 7 years of survey. Given the low and very localised scale of flight activity, distance from the SPA, and lack of connectivity, there will be no significant impacts to the breeding population of this species at Upper Lough Erne SPA.</p> <p>Other sensitive qualifying interests common to the SPA and the study area occur at low numbers. Given the low and very localised scale of flight activity, distance from the SPA, and lack of connectivity, there will be no impacts to these species.</p> <p>This SPA is remote from the development area and the presence of the transmission line will not constitute a significant risk to the bird populations of Upper Lough Erne SPA from the proposed development alone or in-combination with other plans and projects, with the exception of Whooper Swan, for which a possible connection requires further consideration.</p>	Yes (Whooper Swan only)
Dundalk Bay SPA	28km	Great Crested Grebe	There is a limited possibility that Great Crested Grebe breeding in the study area may over winter in this SPA. The potential effects of the proposed development on this SPA	Yes (Great Crested Grebe only)

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Progress To Stage 2 Of AA Process)
(Site Code: IE004026)		Teal Curlew, Golden Plover Lapwing	<p>population will therefore be examined in more detail in later sections of in the NIS by way of Stage Two evaluation.</p> <p>Given the distance of the proposed development from the SPA, the populations of other bird species in the study area of the proposed development are considered separate from those populations of the same species for which the SPA is designated. There was no connectivity observed (flightlines, tagged birds) between the wintering populations of other bird species that occur in the study area Dundalk Bay SPA.</p> <p>This SPA is remote from the development area and there is no possibility of the proposed development having a significant effect on any of the bird populations of Dundalk Bay SPA from the proposed development alone or in-combination with other plans and projects, with the exception of Great Crested Grebe, for which a possible connection requires further consideration.</p>	
Dundalk Bay cSAC (Site Code: IE00455)	28km	None	<p>While the proposed development is located partly within river catchments (Glyde and Fane) linked to this cSAC any potential water quality issues associated with the construction phase are considered highly localised and will have no appreciable effect on the primarily estuarine and marine cSAC located over 28km downstream. It can be concluded that there is no possibility of there being a significant effect on this European site from the proposed development alone or in-combination with other plans or projects.</p>	No
Boyne Coast and Estuary SPA (Site Code: IE004080)	29km	Lapwing Golden Plover	<p>The Boyne Coast and Estuary SPA is located some 29km East of the proposed development. Lapwing and Golden Plover are species common to the SPA and the study area considered for the proposed development.</p> <p>There was no connectivity observed (flightlines, tagged birds) between the wintering populations of Golden Plover or Lapwing that occur in the study area and the Boyne Coast and Estuary SPA.</p> <p>These species are not considered highly collision prone. Flights observed during 7 years of survey were limited in extent (max 500m) and typically occurred between roost sites and nearby foraging areas.</p> <p>Given the distance of the proposed development from the SPA, and lack of connectivity between the study area and the SPA, these populations are considered separate from those for which the SPA is designated. This SPA is remote from the development area and the proposed development will not have any appreciable effects on the bird populations of Boyne Coast and Estuary SPA alone or in-combination with other plans or projects.</p>	No

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Yes Progress To Stage 2 Of AA Process)
Boyne Coast and Estuary cSAC  (Site Code: IE001957)	29km	None	While the proposed development is located within River Boyne catchment and thus forms a hydrological link to this cSAC; any potential water quality issues associated with the construction phase are considered highly localised and will have no appreciable effect on the cSAC, which is located over 28km downstream. No appreciable direct or indirect effects on this European site will occur from the proposed development alone or in-combination with other plans or projects.	No
Lough Oughter and Associated Loughs SPA  (Site Code: IE004049)	35km	Whooper Swan  Great Crested Grebe  Wigeon	<p><b>Whooper Swan</b></p> <p>Whooper Swan are common to the study area and this SPA. There is potential for limited exchange of individual birds between these sites and The SONI Report to Inform Habitats Regulations Assessment for the Northern Ireland portion of the proposed interconnector also identifies the potential for migrating or dispersing birds to cross the alignment if moving between Lough Neagh and Lough Oughter. While not considered a significant issue for the Northern Ireland section of the overhead line, given the local populations of Whooper Swan along the alignment in the Republic of Ireland, the potential effects to this SPA population will be examined in more detail in later sections of this NIS, and are proposed for Stage Two Appropriate Assessment.</p> <p><b>Other species</b></p> <p>There is no connectivity (flightlines, tagged birds) between the wintering populations of Wigeon or Great Crested Grebe that occur in the study area and the SPA. While localised populations of these birds occur within the study area, only flightlines between local lake/ wetland habitats were observed. There is no likely connection between local populations within the study area associated with the proposed development and those in the SPA.</p> <p>Given the distance of the proposed development from the SPA, and lack of connectivity between bird species common to the study area and the SPA, there are no appreciable effects predicted for the bird species of Lough Oughter and Associated Loughs SPA from the proposed development alone or in-combination with other plans and projects, with the possible exception of Whooper Swan (for which a possible connection requires further consideration).</p>	Yes (Whooper Swan only)
Lough Neagh and Lough Beg SPA  (Site Code: UK9020091)	36.7km	Whooper Swan  Great Crested Grebe  Wigeon	<p><b>Whooper Swan</b></p> <p>Whooper Swan are common to the study area and this SPA. There is potential for limited exchange of individual birds between these sites and the SONI Report to Inform Habitats Regulations Assessment for the Northern Ireland portion of the proposed interconnector also identifies the potential for migrating or dispersing birds to cross the alignment as they move into/from Lough Neagh. This SPA is also known to be a key</p>	Yes (Whooper Swan only)

European Site	Closest Point To Proposed Development	Sensitive Qualifying Interests Considered	Identification of Possible Significant Effects of the Proposed Development (Alone or In-Combination with Other Plans and Projects)	Possibility of Significant Effects? (If Yes Progress To Stage 2 Of AA Process)
		Cormorant Greylag Goose Mute Swan Teal Coot Mallard	staging site for returning migrants in spring.  The potential effects to this SPA population (as it may relate to local wintering populations of Whooper Swan along the proposed development) will therefore be examined in more detail in the NIS. In-combination effects with the Northern Ireland section of the proposed interconnector will also be assessed.  <b>Other Species</b>  Given the distance of the proposed development located in counties Monaghan, Cavan and Meath from the Lough Neagh and Lough Beg SPA, and lack of connectivity between bird species common to the study area and the SPA, there is no possibility of there being a significant effect on bird species associated with Loughs Neagh and Beg SPA from the proposed development alone or in-combination with other plans and projects, with the possible exception of Whooper Swan (for which a potential effect requires further consideration).	
Lough Foyle SPA  (Site Code: IE004087, UK9020031)	94km	Whooper Swan	<b>Whooper Swan</b>  Whooper Swan are common to the study area and this SPA. This SPA is also known to be a key staging site for migrating Whooper Swan making landfall on the journey south from Iceland. The potential for effects to this SPA population will therefore be examined in more detail in the NIS.  <b>Other Species</b>  This site is very remote and well removed from the proposed development and no significant effects can arise to other bird species associated with the SPA from the proposed development alone or in-combination with other plans and projects.	Yes (Whooper Swan only)
Lough Swilly SPA  (Site Code: IE004075)	100.3km	Whooper Swan	<b>Whooper Swan</b>  Whooper Swan are common to the study area and this SPA. Again, this SPA is known to be a key staging site for migrating Whooper Swan making landfall on the journey south from Iceland. Thus, the potential for effects to this SPA population will therefore be examined in more detail in the NIS.  <b>Other Species</b>  This site is very remote from the proposed development and there is no possibility that significant effects will arise to other bird species associated with this SPA from the proposed development alone or in-combination with other plans and projects.	Yes (Whooper Swan only)

38 Based on the information contained in **Table 4.3**, it was not considered possible to rule out the potential for significant effects of the proposed development on the conservation objectives of the following European sites, whether alone or in-combination with other developments, without employing mitigation measures:

- River Boyne and River Blackwater cSAC;
- River Boyne and River Blackwater SPA;
- Upper Lough Erne SPA;
- Lough Oughter and Associated Loughs SPA;
- Lough Neagh and Lough Beg SPA;
- Lough Swilly SPA;
- Lough Foyle SPA; and
- Dundalk Bay SPA.

39 Whilst it may well be appropriate to consider certain mitigation measures at the Stage 1 screening, for the purposes of this proposed development, it has been concluded that, in respect of these European sites, the proposed development should proceed to Stage 2 of the AA process, as described in **Section 5** of this NIS. Of course, pursuant to the provisions of Part XAB of the 2000 Act, there is a mandatory obligation on the Board, as competent authority, to carry out screening for Appropriate Assessment before consent is given for this, or any, project. However, it is concluded that all other European sites detailed in this section of the NIS have been correctly screened out or excluded from further consideration on the basis of objective information that the proposed development, individually or in-combination with other plans or projects, will have no, or no appreciable, effects on those sites.

## 5 STAGE TWO APPROPRIATE ASSESSMENT

- 1 In the circumstances set out above, the developer has concluded that there are eight European sites in respect of which there may be the possibility of a significant effect from the proposed development and which, therefore, generate the need for an Appropriate Assessment (AA). Thus, in carrying out an AA under Article 6(3) of the Habitats Directive and Part XAB of the 2000 Act, An Bord Pleanála (the Board) is obliged to make a determination as to whether or not the proposed development would adversely affect the integrity of those European sites, in view of their conservation objectives. The first steps in such a Stage Two AA process are to identify the conservation objectives of the Natura 2000 site and to identify those aspects of the plan or project (alone and in combination with other plans or projects) that have the potential to affect those objectives.
- 2 Accordingly, this NIS contains a comprehensive appraisal of the potential ecological impacts of the proposed development on the eight European sites, which examines the potential direct and indirect impacts of the proposed development (including any 'in-combination' effects) on the sites concerned, in view of those sites' conservation objectives. However, as the competent authority must carry out the AA, based on the NIS and any other information it may consider necessary, in order to facilitate the AA to be conducted by the Board appropriately, mitigation measures are also detailed and analysed where the potential for adverse effects exists. It should be noted that a number of these measures are integral to the overall design of the project, so as to avoid or mitigate potential effects by design.
- 3 In these circumstances, the NIS submitted shall assist the Board to:
  - (i) identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
  - (ii) formulate complete, precise and definitive findings and conclusions; and
  - (iii) thereafter, determine that the proposed development will not adversely affect the integrity of any European site.
- 4 Pursuant to the provisions of Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act, as amended, in conducting an AA, the Board is required to include; an examination, analysis, evaluation, findings, conclusions, as well as its final determination

## 5.1 CHARACTERISTICS OF EUROPEAN SITES

### 5.1.1 River Boyne and River Blackwater cSAC

- 4 The River Boyne and River Blackwater cSAC and SPA boundaries overlap, to a large degree, with the SPA of the same name. However, the cSAC boundary partly extends beyond the river channels to include the more extensive riparian habitats.
- 5 A full description of the River Boyne and River Blackwater cSAC (Site Code: IE002299) is detailed in Appendix A of this NIS. The assessment of vulnerability to threats is identified from relevant Natura 2000 forms and a review of the most recent information on conservation status of described qualifying interests detailed in **Table 5.1**.
- 6 The main threats to the ecological interests of this site identified by the National Parks and Wildlife Service (NPWS) are further drainage schemes and water pollution. NPWS Natura 2000 Data Form and Site Synopsis Form<sup>14</sup> note that in the past, where drainage occurred, it altered the character of the river and removed natural bankside structure and vegetation. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This can be extremely destructive to salmonid habitat. Drainage also impacts on the many small wetland areas throughout the site. Water quality is impaired in parts of the system through agricultural runoff and inputs from domestic and industrial sources. A reduction in the input of pollutants to the system is required to preserve the important aquatic interests in this site as sensitive aquatic qualifying interests in particular Atlantic Salmon depend on high water quality in the cSAC. The conservation objective of this site designation is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and / or the Annex II species for which the River Boyne and River Blackwater cSAC has been selected. Qualifying interests identified as relevant and conservation status are summarised in **Table 5.1**.

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<sup>14</sup> <http://www.npws.ie/protectedsites/specialareasofconservationsac/riverboyneandriverblackwatersac/>.

**Table 5.1: Qualifying Interests of the River Boyne and River Blackwater cSAC and Current Conservation Status Based on Available Information**

Qualifying Interest	Conservation Status Nationally (NPWS 2013) <sup>15</sup>
River Lamprey	Favourable conservation status nationally. Significant populations of river lampreys occur throughout the River Boyne catchment. <sup>16</sup>
Salmon	Unfavourable / inadequate conservation status nationally. The River Boyne currently supports recreational fisheries for salmon with 434 salmon recorded in 2012 <sup>17</sup> . Active conservation management including enhancement and protection measures are being implemented by Inland Fisheries Ireland and local angling groups. The proposed development oversails rivers through which this species passes. Non designated streams oversailed are potential spawning streams. This species requires “good” water quality in particular spawning areas.
Otter	Favourable conservation status nationally. Present along Boyne and Blackwater (field survey observations).
Alkaline fens	Unknown conservation status nationally. No alkaline fens identified in the vicinity of the development.
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	Bad conservation status nationally (trend improving). This habitat does not occur in the vicinity of the proposed development

### 5.1.2 River Boyne and River Blackwater SPA

7 A description of the River Boyne and River Blackwater SPA is detailed in **Appendix A** of this report. The assessment of vulnerability to threats is identified from relevant Natura 2000 forms referenced<sup>18</sup> and a review of the most recent information on conservation status of described qualifying interest is detailed below.

8 The conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Alcedo atthis* [breeding Kingfisher]

<sup>15</sup> NPWS (2013). *The Status of EU Protected Habitats and Species in Ireland*. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013). *The Status of EU Protected Habitats and Species in Ireland*. Habitat Assessments Volume 2. Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

<sup>16</sup> O'Connor W. (2006). A survey of juvenile lamprey populations in the Boyne Catchment. *Irish Wildlife Manuals*, No. 24 National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>17</sup> Inland Fisheries Ireland (2012). Wild Salmon and Sea Trout Statistics Report.

<sup>18</sup> <http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF004232.pdf>

- 9 There are no known threats identified in the NPWS assessment of vulnerability to Kingfisher populations in this SPA<sup>19</sup>. However Kingfishers, as a species which nest in riverside bank holes, are vulnerable during the breeding season to predation (e.g. mink) and possible disturbance at the nest site e.g. resulting from the removal of riparian vegetation etc.
- 10 Kingfisher are an 'Amber' listed breeding species of medium conservation concern in Ireland, as listed on BWI's list of Birds of Conservation Concern In Ireland (BoCCI list)<sup>20</sup>.

### 5.1.3 Lough Oughter and Associated Loughs SPA

- 11 Lough Oughter is a complex of small inter-drumlin lakes along the River Erne in north Cavan, south of Upper Lough Erne. The area comprises a mix of basins, inter-drumlin lakes and small islands with swamp, marsh, flooded grassland and agriculturally-improved grassland. The site is an SPA of special conservation interest for Great Crested Grebe, Whooper Swan and Wigeon together with Wetlands and Waterbirds. The population of Whooper Swan is of international importance, while there are nationally important populations of Great Crested Grebe and Wigeon. Lough Oughter is at the centre of the Irish breeding range for Great Crested Grebe and the site supports in excess of 10% of the estimated national breeding total for this species. Vulnerabilities noted in the Natura 2000 Data Form<sup>21</sup> are water pollution causing further nutrient enrichment, and recreation and wildfowling activities causing disturbance. A full description of Lough Oughter and Associated Loughs SPA is detailed in **Appendix A** of this report.
- 12 The conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:
- *Podiceps cristatus* [wintering Great Crested Grebe];
  - *Cygnus cygnus* [wintering Whooper Swan];
  - *Anas penelope* [wintering Wigeon]; and
  - Wetlands.

### 5.1.4 Upper Lough Erne SPA

- 13 Upper Lough Erne forms at a widening of the River Erne on the Cavan/Fermanagh border and comprises a complex of small inter-drumlin lakes with many small islands adjacent to the main body of the lake. The lakes are bordered by damp pastures, fens, reed swamp and alder/carr and oak woodland. It is one of the most important areas for Whooper Swan supporting internationally

<sup>19</sup> <http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF004232.pdf>

<sup>20</sup> BirdWatch Ireland (2013)

<http://www.birdwatchireland.ie/OurWork/SpeciesHabitatConservationInIreland/BirdsofConservationConcern/tabid/178/Default.aspx>

<sup>21</sup> <http://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004049.pdf>

important numbers of wintering Whooper Swan, and contributes to the maintenance of the geographic range of the Annex 1 Greenland White-fronted Goose. Numbers of Whooper Swan begin to build up in the autumn and continue to increase through the winter. The site probably acts as a staging area for Whooper Swan moving north in the spring. The site also supports an important assemblage of breeding birds including Common Tern, Great Crested Grebe, Curlew, Snipe and Redshank. Nationally important wintering wildfowl species, many of which are migratory, include Great Crested Grebe, Cormorant, Mute Swan, Tufted Duck, Wigeon, Teal, Goldeneye, Coot, Mallard, Snipe, Curlew and Redshank. The main vulnerability noted in the Natura 2000 Data Form is excessive eutrophication of all the lakes which comprise the site<sup>22</sup>. A full description of Upper Lough Erne SPA is detailed in **Appendix A** of this report.

14 The conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Cygnus cygnus* [wintering Whooper Swan]

### 5.1.5 Lough Neagh and Lough Beg SPA

15 Lough Neagh (383km<sup>2</sup>) is the largest freshwater lake in the UK and Ireland. Despite its large size the lough is relatively shallow with a mean depth of just 8.9m. The SPA includes three eutrophic water bodies, Lough Neagh, Lough Beg and Portmore Lough, together with surrounding swamp, fen, wet grassland and swampy woodland. The shoreline is largely exposed with wave-beaten rocks and stones, but there are also some sheltered sandy bays with well developed areas of marginal vegetation. To the north, Lough Beg, is much smaller and shallower. The River Bann connects the two loughs via a narrow land bridge. The main vulnerabilities noted in the Natura 2000 Data Form is excessive eutrophication, land use intensification and invasion of non-native species<sup>23</sup>. A full description of Lough Neagh and Lough Beg SPA is detailed in **Appendix A** of this report.

16 The site qualifies under Article 4.1 of the Birds Directive by regularly supporting internationally important numbers of wintering Bewick's and Whooper Swan, and also nationally important numbers of breeding Common Tern. Numbers of Whooper Swan increase through the autumn with a peak in January and again in March. The site qualifies under Article 4.2 of the Directive as a wetland of international importance by regularly supporting over 20,000 of a variety of species of waterfowl in winter.

17 The conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Cygnus cygnus* [wintering Whooper Swan];

<sup>22</sup> <http://jncc.defra.gov.uk/pdf/SPA/UK9020071.pdf>

<sup>23</sup> <http://jncc.defra.gov.uk/pdf/SPA/UK9020091.pdf>

- *Cygnus columbianus bewickii* [wintering Bewick's Swan];
- *Sterna hirundo* [breeding Common Tern]; and
- Wetlands.

### 5.1.6 Lough Swilly SPA

18 Lough Swilly is a narrow estuarine inlet which runs 50km north to south yet is only 4km wide at its maximum. A mixture of estuarine and non-estuarine habitats are present, including sand/mud flats, brackish lakes, salt marshes, rivers and streams, sand and shingle beaches, grasslands, reedbeds and scrub. The site supports internationally important numbers of Greenland White-fronted Geese, Whooper Swans and Greylag Geese. Additionally 16 species occur regularly in numbers of national importance, and the site qualifies as a wetland of international importance. Site vulnerabilities noted on the Natura 2000 Data Form include landuse practices, aquaculture, and recreational activities<sup>24</sup>. A full description of Lough Swilly SPA is detailed in **Appendix A** of this report.

19 The generic conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Podiceps cristatus* [wintering Great Crested Grebe];
- *Ardea cinerea* [wintering Grey Heron];
- *Cygnus cygnus* [wintering Whooper Swan];
- *Anser anser* [wintering Greylag Goose];
- *Tadorna tadorna* [wintering Shelduck];
- *Anas penelope* [wintering Wigeon];
- *Anas crecca* [wintering Teal];
- *Anas platyrhynchos* [wintering Mallard];
- *Anas clypeata* [wintering Shoveler];
- *Aythya marila* [wintering Scaup];
- *Bucephala clangula* [wintering Goldeneye];
- *Mergus serrator* [wintering Red-breasted Merganser];

<sup>24</sup> <http://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004075.pdf>

- *Fulica atra* [wintering Coot];
- *Haematopus ostralegus* [wintering Oystercatcher];
- *Calidris canutus* [wintering Knot];
- *Calidris alpina* [wintering Dunlin];
- *Numenius arquata* [wintering Curlew];
- *Tringa totanus* [wintering Redshank];
- *Tringa nebularia* [wintering Greenshank];
- *Chroicocephalus ridibundus* [breeding Black-headed Gull];
- *Larus canus* [wintering Common Gull];
- *Sterna sandvicensis* [breeding Sandwich Tern];
- *Sterna hirundo* [breeding Common Tern];
- *Anser albifrons flavirostris* [wintering Greenland White-fronted Goose]; and
- Wetland and Waterbirds.

20 Detailed conservation objectives are available for this SPA which further define the attributes and targets necessary to maintain the favourable conservation status of the species listed above as follows:

- Attribute: Population Trend; Target: Long term population trend stable or increasing.
- Attribute: Distribution; Target: No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation.

21 The relevant population and distribution data is provided in the Conservation objectives supporting document.<sup>25</sup>

### 5.1.7 Lough Foyle SPA

22 The cross-border Lough Foyle complex regularly supports in excess of 20,000 wintering waterbirds making it a wetland of international importance. The western shore lies within Ireland, and the eastern and southern shores lie within Northern Ireland. The assemblage of birds that utilise Lough

<sup>25</sup> NPWS (2011) Lough Swilly Special Protection Area (Site Code 4075) Version 1. Conservation Objectives Supporting Document.

Foyle include internationally important populations of Whooper Swan, Light-bellied Brent Goose and Bar-tailed Godwit, and nationally important populations of a further 18 species. There are no known threats to the wintering bird populations noted on the Natura 2000 Data Form, although developments on the shore above the site could have adverse impacts on the bird populations. A full description of Lough Foyle SPA is detailed in **Appendix A** of this report.

23 The generic conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Gavia stellata* [wintering Red-throated Diver];
- *Podiceps cristatus* [wintering Great Crested Grebe];
- *Cygnus columbianus bewickii* [wintering Bewick's Swan];
- *Cygnus cygnus* [wintering Whooper Swan];
- *Anser anser* [wintering Greylag Goose];
- *Branta bernicla hrota* [wintering Light-bellied Brent Goose];
- *Tadorna tadorna* [wintering Shelduck];
- *Anas penelope* [wintering Wigeon];
- *Anas crecca* [wintering Teal];
- *Anas platyrhynchos* [wintering Mallard];
- *Somateria mollissima* [wintering Eider];
- *Mergus serrator* [wintering Red-breasted Merganser];
- *Haematopus ostralegus* [wintering Oystercatcher];
- *Pluvialis apricaria* [wintering Golden Plover];
- *Vanellus vanellus* [wintering Lapwing];
- *Calidris canutus* [wintering Knot];
- *Calidris alpina* [wintering Dunlin];
- *Limosa lapponica* [wintering Bar-tailed Godwit];
- *Numenius arquata* [wintering Curlew];

- *Tringa totanus* [wintering Redshank];
- *Chroicocephalus ridibundus* [wintering Black-headed Gull];
- *Larus canus* [wintering Common Gull];
- *Larus argentatus* [wintering Herring Gull]; and
- Wetland and Waterbirds.

### 5.1.8 Dundalk Bay SPA

24 Dundalk Bay is a large open shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16km from Castletown River on the Cooley Peninsula, in the north, to Annagassan/Salterstown in the south. The bay encompasses the mouths of the estuaries of the Rivers Dee, Glyde, Fane, Castletown and Flurry. The outer part of the bay provides excellent shallow-water habitat for divers, grebes and sea duck. The site is internationally important for waterfowl on the basis that it regularly holds over 20,000 birds. It also qualifies as a site of international importance for supporting populations of Brent Goose, Black-tailed Godwit and Bar-tailed Godwit. It supports nationally important numbers of Great Crested Grebe, Greylag Goose, Shelduck and other waterfowl. A full description of Dundalk Bay SPA is detailed in **Appendix A** of this report.

25 The generic conservation objective of this site is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:

- *Podiceps cristatus* [wintering Great Crested Grebe];
- *Anser anser* [wintering Greylag Goose];
- *Branta bernicla hrota* [wintering Light-bellied Brent Goose];
- *Tadorna tadorna* [wintering Shelduck];
- *Anas crecca* [wintering Teal];
- *Anas platyrhynchos* [wintering Mallard];
- *Anas acuta* [wintering Pintail];
- *Melanitta nigra* [wintering Common Scoter];
- *Mergus serrator* [wintering Red-breasted Merganser];
- *Haematopus ostralegus* [wintering Oystercatcher];

- *Charadrius hiaticula* [wintering Ringed Plover];
- *Pluvialis apricaria* [wintering Golden Plover];
- *Pluvialis squatarola* [wintering Grey Plover];
- *Vanellus vanellus* [wintering Lapwing];
- *Calidris canutus* [wintering Knot];
- *Calidris alpina* [wintering Dunlin];
- *Limosa limosa* [wintering Black-tailed Godwit];
- *Limosa lapponica* [wintering Bar-tailed Godwit];
- *Numenius arquata* [wintering Curlew];
- *Tringa totanus* [wintering Redshank];
- *Chroicocephalus ridibundus* [wintering Black-headed Gull];
- *Larus canus* [wintering Common Gull];
- *Larus argentatus* [wintering Herring Gull];

*Wetland and Waterbirds.*

26 Detailed conservation objectives are available for this SPA which further define the attributes and targets necessary to maintain the favourable conservation status of the species listed above as follows:

- Attribute: Population Trend; Target: Long term population trend stable or increasing.
- Attribute: Distribution; Target: No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation.

27 The relevant population and distribution data is provided in the Conservation objectives supporting document.<sup>26</sup>

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<sup>26</sup> NPWS (2011) Dundalk Bay SPA (004026) Version 1. Conservation Objectives Supporting Document.

## 5.2 POTENTIAL IMPACTS

### 5.2.1 River Boyne and Blackwater cSAC and SPA

28 The overhead line (OHL) will oversail the River Boyne and River Blackwater cSAC and SPA at two locations see **Figures 5.1** and **5.2**:

- The River Boyne between Towers 355 and 356 in the townlands of Rathnally and Trubley near Trim; and
- The River Blackwater between Towers 310 and 311 in the townlands of Castlemartin and Teltown close to Donaghpatrick Village.

29 It is important to note that no towers or guard poles will be located or works conducted within the European sites and that tower locations are at a remove from the European site boundaries. **Table 5.2** identifies a number of key sensitive locations where potentially sensitive qualifying receptors may require mitigation.

30 The key activities identified which may affect water quality are identified during the construction phase and include:

- Laying of temporary access tracks (using aluminium panels / rubber mats), where necessary;
- Excavation of tower foundations and construction of towers;
- Excavation of guard pole foundations;
- Works near watercourses;
- Construction materials;
- Stockpiling material; and
- Stringing of conductors.

31 These activities have the potential, without mitigation, to impact on the water environment and associated qualifying aquatic species in the River Boyne and River Blackwater cSAC and SPA by causing:

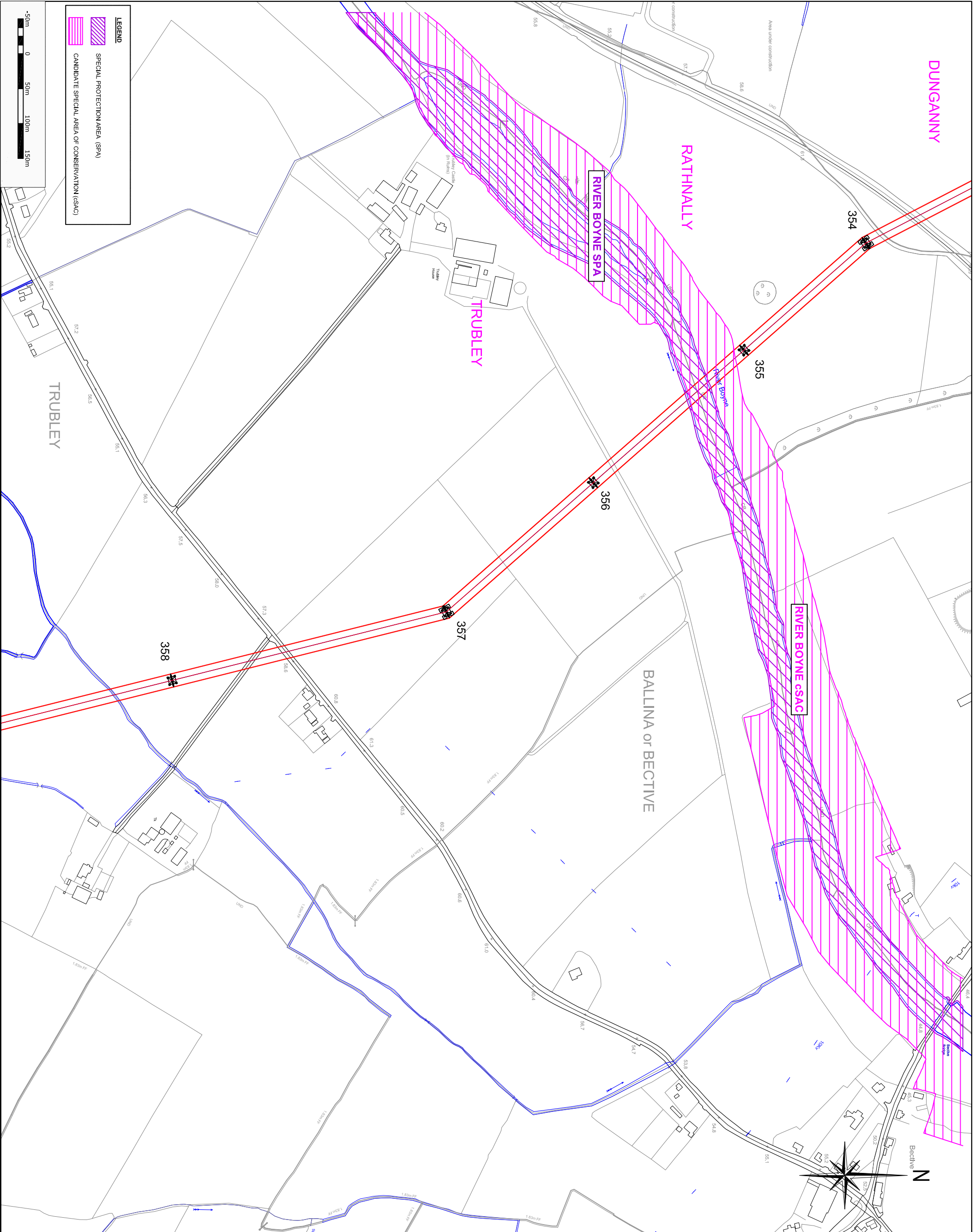
- Sediment Discharges associated with dewatering at tower locations, soil water runoff and more direct discharges to water courses;
- Erosion of banksides;

- Disturbance to otter / Kingfisher breeding sites (riparian areas crossed); and
- Contaminant discharges e.g. petroleum runoff.

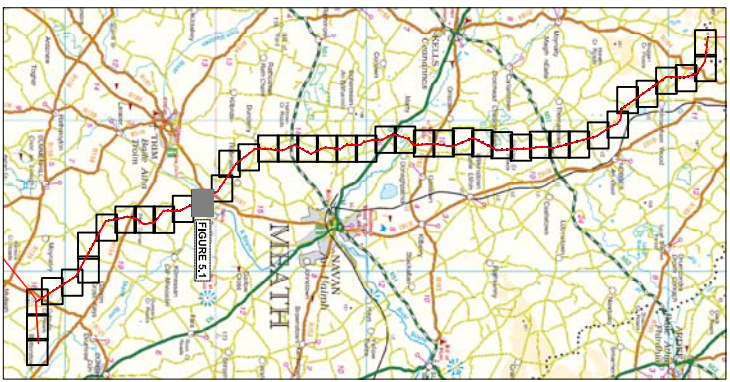
32 It is likely that the effects of decommissioning would be temporary and of a similar scale or less than the construction phase.

33 A number of tributary rivers (non-designated) linked to this site are also oversailed and general locations are also detailed in **Table 5.2**. Potential impacts have been identified, together with mitigation measures recommended in the event that such potential impacts arise. Moreover, the effectiveness of these proposed mitigation measures have also been detailed. A detailed description of this proposed mitigation is described in **Section 6** of this report.





**KEY PLAN:**



**NOTE:**  
 - Transmission lines and towers not to be scaled.

- NOTES:**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
  2. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chk.
A	31.01.14	Issued	MM DG	

Client:



Project:  
 NORTH-SOUTH 400 KV  
 INTERCONNECTION DEVELOPMENT

Title:  
 MEATH STUDY AREA (MSA)  
 BOYNE RIVER CROSSING

Scale @ A3: 1:5,000

Prepared by: M. Nolan  
 Checked: D. Grehan  
 Date: January 2014

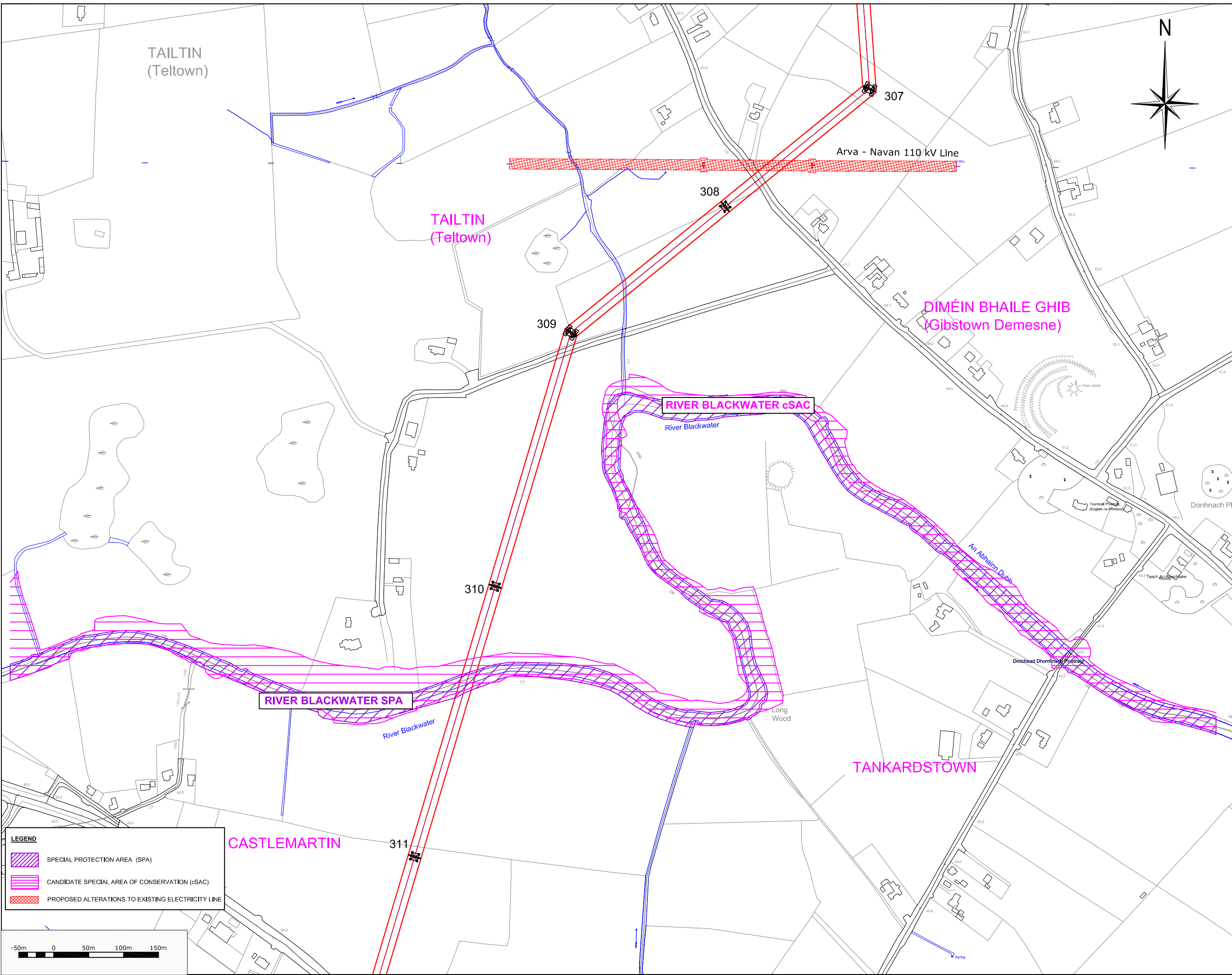
Project Director: D. Grehan



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Drawing No.: Figure 5.1 (MSA)      Revision: A



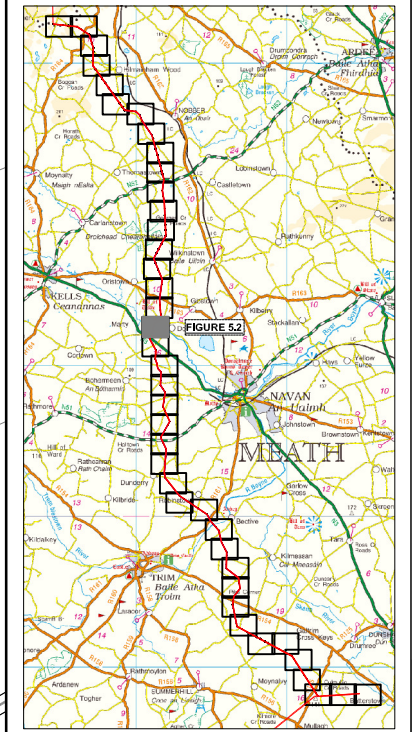


**LEGEND**

	SPECIAL PROTECTION AREA (SPA)
	CANDIDATE SPECIAL AREA OF CONSERVATION (cSAC)
	PROPOSED ALTERATIONS TO EXISTING ELECTRICITY LINE



**KEY PLAN:**



**NOTE:**  
- Transmission lines and towers not to be scaled.

- NOTES:**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
  - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
B	April 15	UPDATE FOLLOWING DESIGN REVIEW	MIN	DG
A	31.01.14	Issued	MIN	DG

Client:

Project:  
**NORTH-SOUTH 400 KV INTERCONNECTION DEVELOPMENT**

Title:  
**MEATH STUDY AREA (MSA) BLACKWATER RIVER CROSSING**

Scale @ A3: **1:5,000**  
 Prepared by: **M. Nolan**    Checked: **D. Grehan**    Date: **April 2015**  
 Project Director: **D. Grehan**

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Drawing No.: **Figure 5.2 (MSA)**    Revision: **B**



**Table 5.2: Key Sensitive Locations, Qualifying Interests, Potential Impacts and Mitigation Measures**

Key Sensitive Locations	Key Observations	Qualifying Interests Relevant	Potential Impacts	Likelihood Of A Adverse Effect (Without Mitigation)	Mitigation Measures	Mitigation Effectiveness <sup>27</sup>
River Boyne and River Blackwater cSAC and River Boyne and River Blackwater SPA between Towers 355 and 356	<p>Tower 355 is located in farmland close to the cSAC boundary (ca. 6m) on the top of a relatively steep slope consisting of low scrub vegetation). However it is located over 60m from the actual river watercourse.</p> <p>Tower 356 is on the other side of the Boyne ca.160m from the cSAC (and river edge) on relatively flat managed farmland. No element of the development is located within the cSAC / SPA, though the conductors oversail the site.</p>	<p>No terrestrial habitats comprising of qualifying interests of the site, exist at this location. Woody vegetation and general riparian areas have been avoided by the development and no tree lopping / trimming will be required.</p> <p>There is no requirement to access the cSAC / SPA boundaries for any aspect of the development. In this regard the potential for disturbance to possible otter and Kingfisher (qualifying species of cSAC / SPA) breeding sites is avoided.</p> <p>Aquatic qualifying interests (e.g. salmon and lamprey) require consideration as regards water quality.</p>	<p>The potential for adverse localised impacts / effects at this location is low. However the potential for temporary localised impacts to water quality and associated aquatic qualifying interests (salmon and lamprey) has been identified for the construction stage (tower construction, access tracks, stringing of conductors and works to existing 110kV transmission lines being crossed by the proposed 400kV line).</p> <p>No tree cutting or bankside disturbance is required at this location thereby avoiding any possible disturbance to otter and Kingfisher breeding sites.</p>	Uncertain	<p>Water pollution controls will be implemented, as detailed in <b>Section 6</b>.</p> <p>Monitoring of works will be conducted in the vicinity of the river by Ecological Clerk of Works (ECoW), to ensure effective implementation of mitigation measures</p> <p>Riparian areas will be avoided (thereby ensuring avoidance of possible disturbance to fauna).</p>	Certain Mitigation measures will be monitored and a feedback loop will be in place for any unexpected under performance as detailed in <b>Section 6.2</b> .
River Boyne and River Blackwater cSAC and River Boyne and River Blackwater SPA between	The River Blackwater is oversailed by the alignment at a broad meander meaning	No terrestrial habitats comprising of qualifying interests of the site, exist at this location.	The potential for adverse localised impacts / effects at this location is low.	Uncertain	Water pollution controls will be implemented, as	Certain Mitigation measures will

<sup>27</sup> Standard terminology relating to confidence in predictions following IEEM (2006) guidelines

Key Sensitive Locations	Key Observations	Qualifying Interests Relevant	Potential Impacts	Likelihood Of A Adverse Effect (Without Mitigation)	Mitigation Measures	Mitigation Effectiveness <sup>27</sup>
Towers 311 and 310	<p>three towers are proximate to the European site as follows. Tower 311 is located in farmland approximately 191m south of the closest point of the cSAC (195m from river edge). Tower 310 is ca. 88m north of the cSAC boundary (100m from river edge) in farmland. Tower 309 is 84m north west of the cSAC boundary (105m from river edge) in a hedgerow with wet grassland. The riparian and river zone crossed is relatively narrow (ca. 30m) with a few low willow bushes. No element of the development is located within the cSAC / SPA though the conductors oversail the site.</p>	<p>Woody vegetation and general riparian areas have been avoided by the development and no tree lopping / trimming will be required.</p> <p>There is no requirement to access the European site for any aspect of the development. In this regard, any potential disturbance to possible otter and Kingfisher (qualifying species of cSAC / SPA) breeding sites is avoided.</p> <p>Aquatic qualifying interests (e.g. salmon and lamprey) require consideration as regards water quality.</p>	<p>However the potential for temporary localised impacts to water quality and associated aquatic qualifying interests (Atlantic salmon and lamprey) has been identified for the construction stage (tower construction, access tracks, stringing of conductors and works to existing 110kV transmission lines being crossed by the proposed 400kV line).</p> <p>No tree cutting and bankside disturbance is required at this location thereby avoiding any possible disturbance to otter and Kingfisher breeding sites.</p>		<p>detailed in <b>Section 6</b>.</p> <p>Monitoring of works will be conducted in the vicinity of the river by ECoW, to ensure effective implementation of mitigation measures.</p> <p>Riparian areas will be avoided (thereby ensuring avoidance of possible disturbance to fauna).</p>	<p>be monitored and a feedback loop will be in place for any unexpected under performance as detailed in <b>Section 6.2</b>.</p>

Key Sensitive Locations	Key Observations	Qualifying Interests Relevant	Potential Impacts	Likelihood Of A Adverse Effect (Without Mitigation)	Mitigation Measures	Mitigation Effectiveness <sup>27</sup>
<p>Tributaries of the River Boyne and River Blackwater cSAC and SPA:</p> <ol style="list-style-type: none"> <li>1. Boycetown River between Towers 376 and 377.</li> <li>2. Stream between Towers 350 and 351.</li> <li>3. Clady River three crossings between Towers 347 and 344.</li> <li>4. Natural flood plain drainage ditch between Towers 308 and 309 and between proposed poleset replacements on the Arva-Navan 110kV line.</li> <li>5. Small stream between Tower 314 and 313.</li> <li>6. Small stream between Tower 318 and 317.</li> <li>7. Stream between Towers 358 and 359.</li> <li>8. Kilmainham River between Towers 251 and 252.</li> </ol>	<p>Non-designated rivers are oversailed by the alignment. These rivers are linked to the River Boyne and River Blackwater cSAC / SPA. All tower locations are removed from the riparian zone.</p>	<p>All rivers oversailed were identified as potential breeding sites for mobile qualifying interest species (Kingfisher and otter) potentially linked to European sites (detailed above) downstream. Given that tree cutting disturbance will potentially arise there is a requirement to consider potential disturbance to Kingfisher and otter.</p> <p>Aquatic qualifying interests (e.g. salmon and lamprey) require consideration with regard to the protection of water quality.</p>	<p>The potential for adverse localised impacts / effects at this location is low. However the potential for temporary localised impacts to water quality and associated aquatic qualifying interests (salmon and lamprey) has been identified for the construction stage (tower construction, access tracks, stringing of conductors and works to existing 110kV transmission lines being crossed by the proposed 400kV line).</p> <p>There is a potential for tree cutting and bank side disturbance at these locations hence there is the possibility of disturbance to otter and Kingfisher breeding sites.</p>	<p>Uncertain</p>	<p>Monitoring of works to be conducted in the vicinity of the river by ECoW, will ensure effective implementation of mitigation measures.</p> <p>Riparian areas will be avoided where possible (thereby ensuring avoidance of possible disturbance to fauna).</p> <p>Water pollution controls will be implemented, as detailed in <b>Section 6</b>.</p> <p>Tree trimming (if required) in riparian areas will be conducted in a manner which avoids possible disturbance to Kingfisher / otter breeding sites. Tree trimmings will be monitored by ECoW, to ensure effective implementation of mitigation measures.</p>	<p>Certain</p> <p>Mitigation measures will be monitored and a feedback loop will be in place for any unexpected performance as detailed in <b>Section 6.2</b>.</p>

- 34 No adverse effects have been identified for qualifying interests of the sites during the operational stage of the project. This ecological appraisal has considered relevant potential impacts including:
- Disturbance associated with riparian woodland trimming (infrequent trimming of riparian vegetation); and
  - Possible localised impacts to water quality associated with maintenance works.
- 35 These effects will be of a very limited scale and, for example, will not require disturbance to river banks and lower vegetation where potential otter / Kingfisher breeding sites occur.

## 5.2.2 Potential Impacts to Remote SPA Sites

- 36 Whooper Swans were highlighted in the An Bord Pleanála (the Board) scoping opinion and also during consultation with BWI and NPWS, as extensively using the study area, in numbers that can exceed nationally significant levels (greater than 150 birds *per* Boland *et al.*, 2010<sup>28</sup>). This species is considered highly susceptible to collision with powerlines. In this regard it was identified as a key species for consideration regarding potential effects of the proposed development.
- 37 The population and movements of Whooper Swan in the study area (CMSA and MSA), which occur outside of European sites, were studied in detail. Information relating to these local populations is presented below, and an assessment of impacts at a local scale is detailed in **Section 5.2.3**. This information is considered relevant to the NIS as a proportion of the swans that winter in the study area may make landfall at the staging sites of Lough Swilly and Lough Foyle SPAs on the north coast of Ireland as indicated by peak counts in Autumn. Additionally, returning migrants in spring are understood to stage at Lough Neagh and Upper Lough Erne, as indicated by peak counts in Spring. If local populations in the study area were to be significantly affected by the proposed development (by way of collision mortality), there could potentially be knock-on consequences for these SPA populations.
- 38 Information regarding potential migratory flightlines between the study area Whooper Swan population, and the European sites under consideration, is presented in **Section 5.2.4**. A southerly migratory flight in Autumn and a return migratory flight in Spring occur with potential landfall at the relevant SPA sites. Other migratory movements within the wintering season also require consideration.

---

<sup>28</sup> Boland H, McElwaine J, Henderson G, Hall C, Walsh A & Crowe O (2010). *Whooper Cygnus cygnus and Bewick's C. columbianus bewickii Swans in Ireland: results of the International Swan Census, January 2010*. Irish Birds 9: 1-10 (2010).

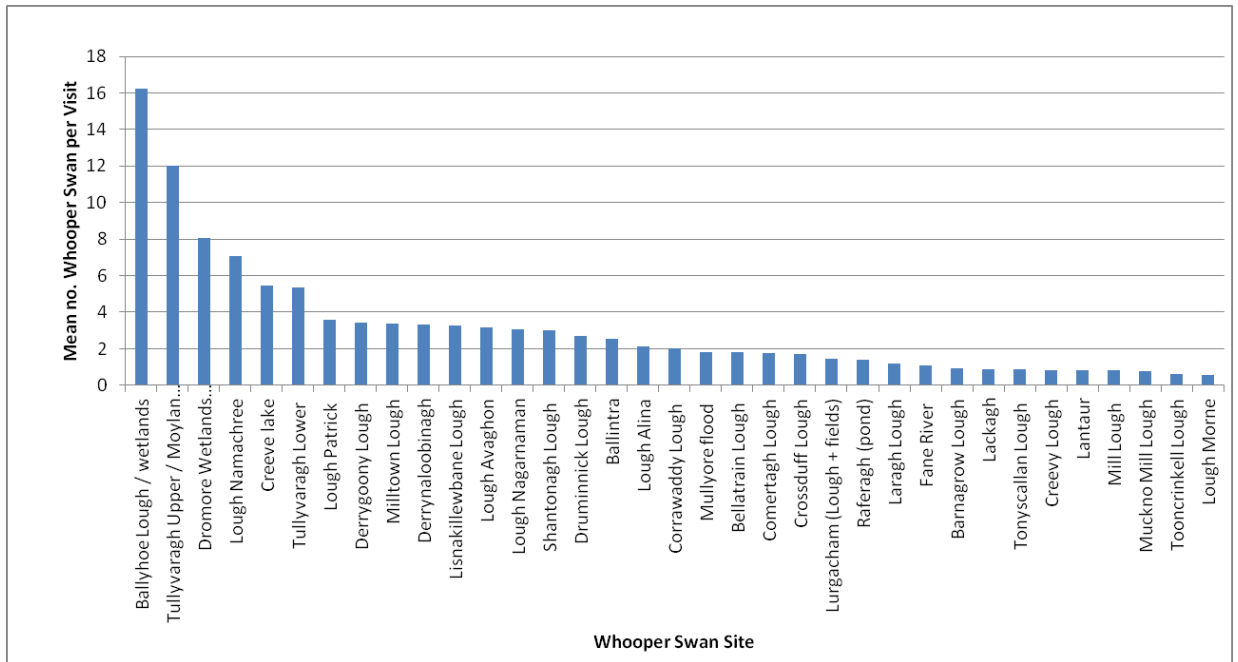
- 39 Potential impacts to the wintering Great Crested Grebe population of Dundalk Bay SPA are considered in **Section 5.2.6**.

#### 5.2.2.1 Whooper Swan in the Study Area

- 40 Over a period of seven years, surveys for Whooper Swan and other wintering birds were undertaken on a monthly basis during the period of October to April. The data collected is presented in **Appendix B** of this report.

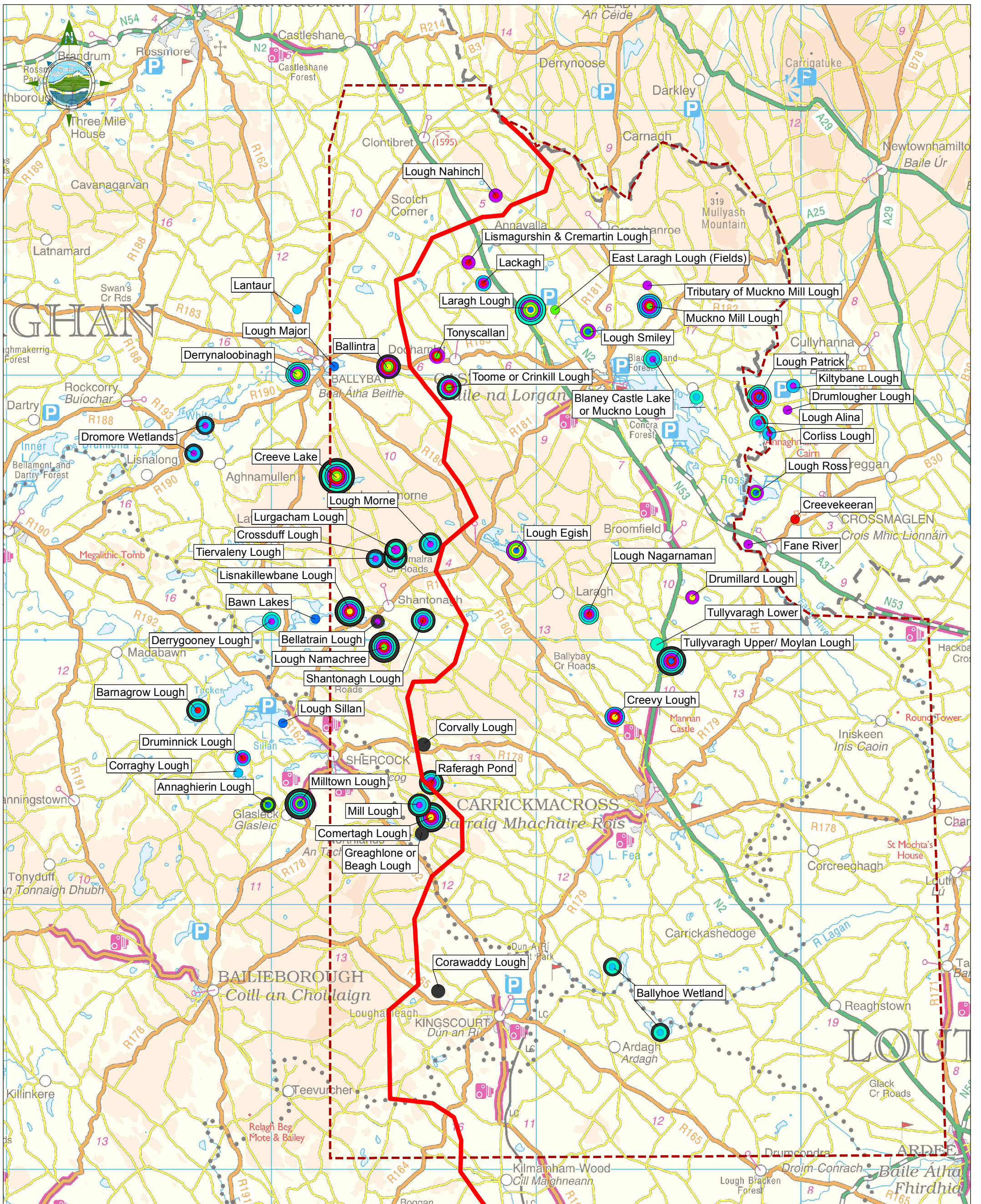
#### Whooper Swan in the CMSA

- 41 56 No. sites have been identified in the wider CMSA as being utilised by Whooper Swan during the study (desk and field survey) and historically. Three of these sites are historical records only i.e. despite being regularly surveyed during the current study no Whooper Swans were recorded. These sites include Lough Major, Lough Sillan, and Bawn Lakes. It should be noted that the wider study area has been subject to continual winter surveys (2010 – 2014 inclusive) as highlighted in **Figure 5.4**.
- 42 During the course of surveys, no individual site within the wider CMSA study area exceeded nationally significant levels. The most regularly utilised and important site close to the alignment is Lough Namachree with maximum counts of 65 swans (approximately 0.5% national population). Other sites of county importance identified during the study include Lough Creeve and fields at Ballintra. Key wintering Whooper Swans and other wintering bird sites have been avoided by the proposed development. No Whooper Swans have been noted during surveys to date on Lough Major which has held nationally significant numbers in the past (Source: NPWS).
- 43 A summary of the most important individual Whooper Swan sites identified in the CMSA based on average values for the survey period are summarised in **Figure 5.3**.



**Figure 5.3: Key sites in the CMSA (ranked based on highest to lowest average bird counts during surveys)**

44 The most important sites in the wider study area including Ballyhoe Lough /Wetlands (>10km), Tullyvaragh Upper/ Moylan (>10km) and Dromore wetlands (>3.8km) are well removed from the proposed development. The alignment is located to the east of 3 important linear wetland areas where Whooper Swan concentrate including the Dromore River Valley, a cluster of lakes west of Lough Morne, and Knappagh River (and associated lakes).



- Legend**
- Cavan Monaghan Study Area (CMSA)
  - Proposed Line Route
  - Historical Swan site
  - Whooper Swan sites recorded in Winter Survey Period 1: 2007/2008
  - Whooper Swan sites recorded in Winter Survey Period 2: 2008/2009
  - Whooper Swan sites recorded in Winter Survey Period 3: 2009/2010
  - Whooper Swan sites recorded in Winter Survey Period 4: 2010/2011
  - Whooper Swan sites recorded in Winter Survey Period 5: 2011/2012
  - Whooper Swan sites recorded in Winter Survey Period 6: 2012/2013
  - Whooper Swan sites recorded in Winter Survey Period 7: 2013/2014

NOTE:  
Multi-year/ period observation dots stacked.  
Thickness of Route Line not to scale. Actual Route Corridor much narrower.

Scale @ A3: 1:130,000  
0 0.5 1 2 3 4 5  
Kilometres

Issue	Date	Description	By	Chkd.
B	DEC 2014	Issued	G.F.	O.McA.
A	JAN 2014	Issued	M.S.	E.C.

NOTES  
1. DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING  
2. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD  
3. WHOOPER SWANS DATA BASED ON SITE SURVEYS

Client:

Project:  
NORTH-SOUTH 400 kV  
INTERCONNECTION DEVELOPMENT

Title:  
WHOOPER SWAN DISTRIBUTION

Prepared by: G.Fil  
Checked: O.McAlister  
Date: December 2014

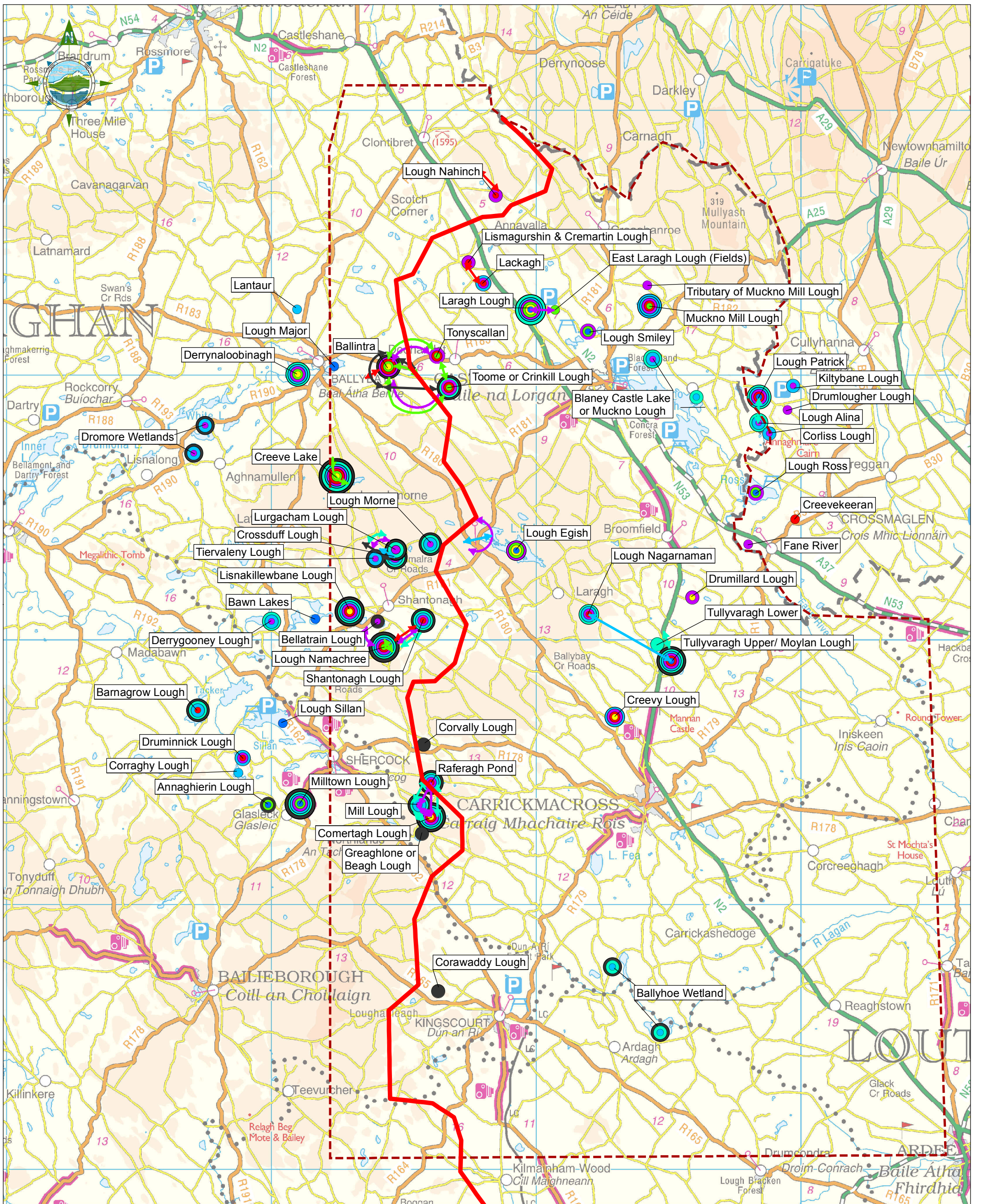
Project Director: D.Grehan

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6244 FIGURE 5.4 (CMSA) Issue: B





**Legend**

- Cavan Monaghan Study Area (CMSA)
- Proposed Line Route
- Historical Swan site
- Whooper Swan sites recorded in Winter Survey Period 1: 2007/2008
- Whooper Swan sites recorded in Winter Survey Period 2: 2008/2009
- Whooper Swan sites recorded in Winter Survey Period 3: 2009/2010
- Whooper Swan sites recorded in Winter Survey Period 4: 2010/2011
- Whooper Swan sites recorded in Winter Survey Period 5: 2011/2012
- Whooper Swan sites recorded in Winter Survey Period 6: 2012/2013
- Whooper Swan sites recorded in Winter Survey Period 7: 2013/2014
- Flight Lines 2007/2008
- Flight Lines 2008/2009
- Flight Lines 2009/2010
- Flight Lines 2010/2011
- Flight Lines 2011/2012
- Flight Lines 2012/2013
- Flight Lines 2013/2014

NOTE:  
Multi-year/ period observation dots stacked.  
Thickness of Route Line not to scale. Actual Route Corridor much narrower.

Scale @ A3: 1:130,000

Issue	Date	Description	By	Chkd.
B	DEC 2014	Issued	G.F.	O.MGA.
A	JAN 2014	Issued	M.S.	E.C.

NOTES:  
1. DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING  
2. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD  
3. WHOOPER SWANS DATA BASED ON SITE SURVEYS

Client:

Project: NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT

Title: WHOOPER SWAN DISTRIBUTION FLIGHT LINES

Prepared by: G.Fil  
Checked: O.McAlister  
Date: December 2014

Project Director: D.Grehan

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6244 FIGURE 5.5 (CMSA)



45 The key findings of the study include:

- At Ballintra a regular flightline was confirmed in the first four winters of the study (between 2007 and 2011) and again in 2014. Ballintra consists of a feeding area which swans fly to during the day. They roost at two small lakes (Loughs Tonyscallan and Toome (or Crinkill)) which are located approximately 1.5 and 2km east and east south-east of Ballintra respectively. This flightline crosses the proposed alignment as shown in **Figure 5.5**. In winters 2011 - 2013 inclusive, no Whooper Swan activity was recorded in this area.
- Based on observed number changes, an irregular flight line exists across the alignment in the Comertagh, Corvally, Greaghlonge, Mill Lough, and Raferagh Pond area as Whooper Swan move throughout the winter between this cluster of lake sites.
- Similarly, based on observed number changes, an irregular flight line exists across the alignment between Lough Egish and Lough Morne and lakes to the west.
- In 2013 / 2014, three new sites were determined relatively close to the alignment including Corvally (650m) and Greaghlonge Loughs (1.25km) – see above. A small number (3) of Whooper Swans were additionally recorded at Corawaddy Lough
- No records of Whooper Swan were determined for other numerous lakes (Loughs) and ponds despite regular survey. These include the following loughs within 2km of the preferred line route, (from north to south); Tassan, White, Black, Cornamucklagh, Letterbane, Ghost, Drumgristin, Coogans, Cordoo, Corfin, Boraghy, unnamed ponds Corvalley townland and Muff.

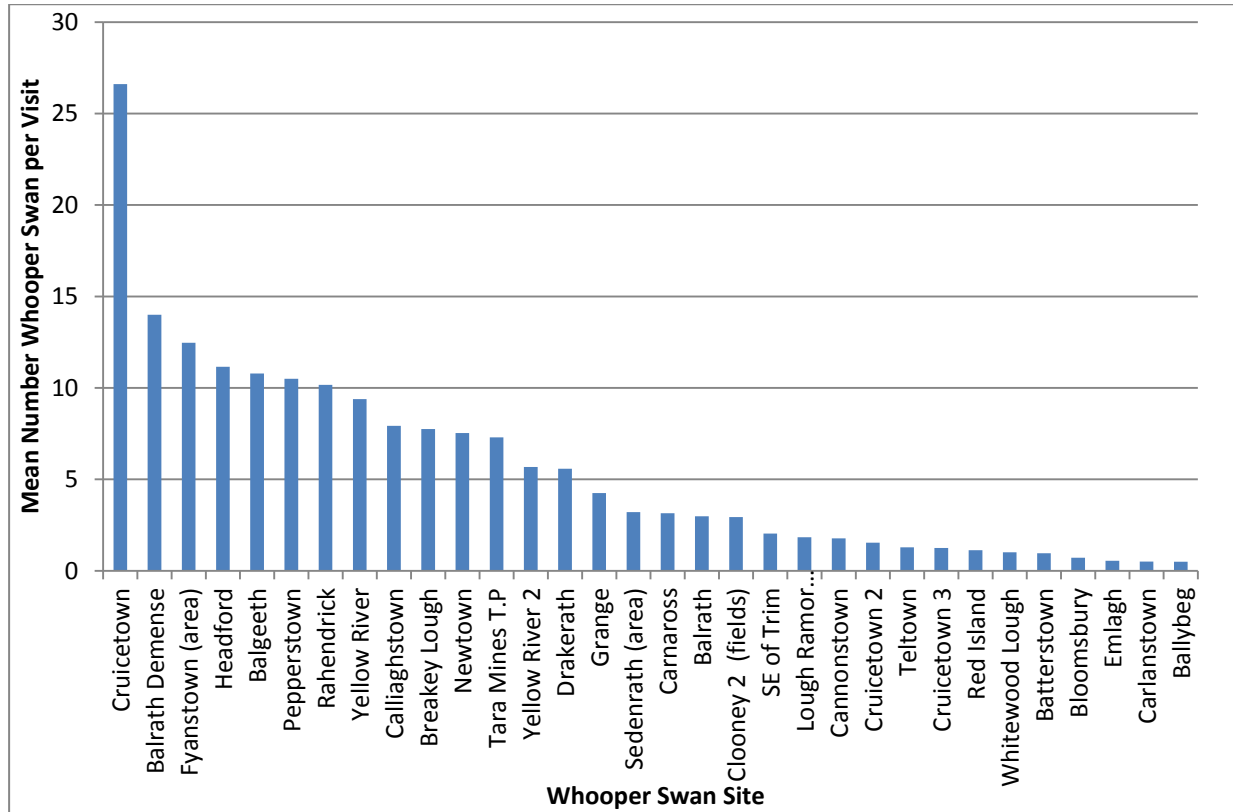
### **Whooper Swan in the MSA**

46 39 individual sites were identified in the wider MSA as being utilised by Whooper Swan during the survey period. An additional 15 sites were identified in the literature review or in consultation with NPWS as historical Whooper Swan sites, however, no birds were recorded over the survey period at these 15 sites. The Whooper Swan sites identified as part of this study are part of more extensive sites / areas highlighted and evaluated as part of the International Swan Census (Crowe 2005<sup>29</sup>). For example, the River Blackwater site (in Crowe 2005) includes individual sites detailed, such as Fyanstown, Sedenrath, Tara Mines Tailings Ponds and Headford Estate. Flocks of Whooper Swan are highly dynamic and can be clustered together in large flocks or spread throughout the wider landscape in smaller flocks. Variables including food availability, security from predators (large open fields are preferred) and areas of temporary flooding all influence distribution and hence flightlines and flightline

<sup>29</sup> Crowe O, McElwaine JG, Worden J, Watson GA, Walsh A & Boland H. (2005). *Whooper Cygnus cygnus and Bewick's C. columbianus bewickii Swans in Ireland: Results of the International Swan census, January 2005*. Irish Birds 7(4):483-488.

regularity in the study area. As detailed above, the wider study area has been subject to continual winter surveys between 2007 / 2008 and 2013 / 2014 inclusive as highlighted in **Figure 5.7**.

47 A summary of the most important individual Whooper Swan sites identified based on average values for the survey period (WSP1-7) are summarised in **Figure 5.6**.



**Figure 5.6: Key Sites in the MSA (Ranked Based on Highest to Lowest Average Bird Counts during surveys).**

48 It is possible to merge the information gathered on these sites (Figure 5.6) into larger key areas. This is based on information from the flight line survey –with movements to and from roost sites. These key areas are identified in **Table 5.3**.

**Table 5.3: MSA Sites identified during survey as being associated with Key Areas based on flightlines identified between roost and forage areas**

KEY AREA	SITES
Balrath	Balrath Demesne
Balrath	Balgeeth
Balrath	Pepperstown
Balrath	Calliaghstown
Balrath	Balrath
Balrath	Cannonstown
Clooney	Clooney 2 (fields)
Cruicetown	Cruicetown
Cruicetown	Newtown
Cruicetown	Cruicetown 2
Cruicetown	Cruicetown 3
Cruicetown	Whitewood Lough
River Blackwater Valley (between Kells and Navan)	Headford
River Blackwater Valley (between Kells and Navan)	Grange
River Blackwater Valley (between Kells and Navan)	Fyanstown (area)
River Blackwater Valley (between Kells and Navan)	Yellow River
River Blackwater Valley (between Kells and Navan)	Tara Mines T.P
River Blackwater Valley (between Kells and Navan)	Yellow River 2
River Blackwater Valley (between Kells and Navan)	Sedenrath (area)
River Blackwater Valley (west of Kells)	Rahendrick
River Blackwater Valley (west of Kells)	Carnaross
Emlagh	Emlagh
Emlagh	Carnaross

49 The key areas where Whooper Swan concentrate and where flightlines emanate (in relation to the study area covered) are the River Blackwater Valley (between Kells and Navan), Cruicetown, Balrath, River Blackwater (west of Kells) and Breaky Lough. Clooney and Emlagh contain much lower and less frequent records. All these sites are located between 0.9km (Cruicetown) and 16km (Balrath) from the alignment. The Blackwater Valley (between Kells

and Navan) is the most important area for Whooper Swan, with significant roost sites at Tara Mines tailings ponds and Headford estate and outlying regularly used forage sites up to 10km distant from these roost sites.

50 The Blackwater Valley (between Kells and Navan), Balrath and Cruicetown areas (as defined in **Table 5.3**) support (at least occasionally) nationally important numbers of Whooper Swan. Other less important areas are the River Blackwater (west of Kells), Breaky Lough and Emlagh. These are either well removed from the proposed alignment and / or no flightlines linking these sites have been recorded, or are likely. It should be noted that land reclamation works have occurred in recent years at the Cruicetown roost and forage site, and numbers have diminished, however it continues to be regularly utilised by lower numbers of Whooper Swan.

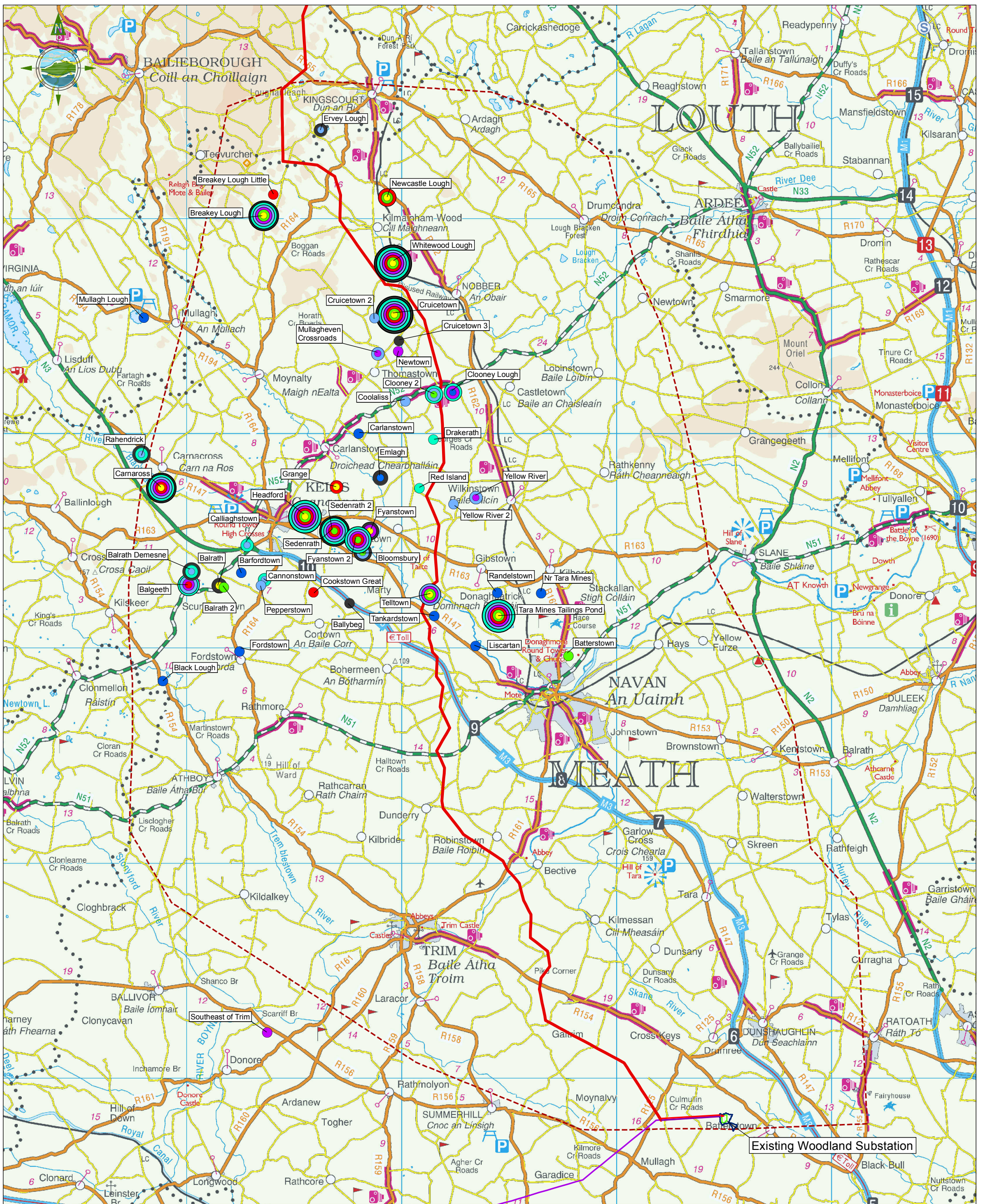
51 The key findings of the study are summarised below from the southernmost to northern most point of the proposed development. The data for all survey years is presented in **Appendix B**:

- The area south of the River Blackwater to Woodland substation does not hold significant concentrations of Whooper Swan. Despite regular drive round and aerial surveys no significant concentrations of Whooper Swans were observed.
- A regular nationally important population of Whooper Swans overwinter in the Blackwater Valley area.
- The alignment crosses the Blackwater River between various foraging sites in the Blackwater Valley and an important roost site at Tara Mines Tailings Ponds.
- Overwintering sites in the Blackwater Valley include Sedenrath, Fyanstown and Bloomsbury, and the outlying sites at Grange.
- The Whooper Swans in the River Blackwater Valley mostly roost at Headford Estate (away from the alignment) and Tara Mines Tailing Ponds (alignment bisects flightline).
- An irregularly used foraging site is over sailed by the alignment between Towers 309 and 310 at Teltown. Numbers at this site never exceeded national importance.
- Whooper Swans irregularly use arable farmland along the Yellow River area in numbers which can reach close to National Importance. This area is located between 1 and 2km east of the alignment (Towers 291 to 295). Flightlines noted in this area are to Tara Mines Tailings Ponds roost site which avoids crossing the alignment.
- The extensive arable farmland between the townland of Mountainstown up to the N52 road crossing supports a number of highly dispersed irregularly utilised sites. Sites used are governed by food availability (potatoes preferred) and temporary flooding.

These include the following sites (fields used); Drakerath, Red Island, Clooney 2, Coolaliss and Clooney Lough.

- South of Clooney Lough, a more recent Whooper Swan site (2012 / 2013 surveys) was identified in the townland of Drakerath (approximately 500m west of Tower 286). No birds were recorded here in previous and most recent (2013 / 2014) surveys. The Drakerath site consists of a flooded potato field which was utilised as a foraging and roosting site. No flightlines were recorded crossing the alignment in this area and observed Whooper Swans were noted foraging and roosting only at this location.
- Smaller flocks of Whooper Swans were noted as regularly foraging in various fields west of Clooney Lough (Coolaliss and Clooney 2). A roost site (area of temporary flooding) was noted adjacent to the foraging area at Clooney 2. The distance of observed foraging and roost areas was approximately 300 to 500m west of the alignment at Towers 280 and 281. One flightline was observed crossing the alignment in this area and 4 flightlines were noted very close to here (<500m from the alignment).
- The northern section of the proposed development passes close to Cruicetown, a foraging and roosting site for Whooper Swan. While the birds concentrate at Cruicetown, varying numbers spread out from this site to different foraging areas, and to Whitewood Lough (which specifically requires flights across the alignment). This area includes a flight line which was recorded in some years as crossing the alignment including in 2013 / 2014.





**Legend**

- Meath Study Area (MSA)
- Proposed Line Route

- Historical Swan site
- Swan sites recorded in Winter Survey Period 1: 2007/2008
- Swan sites recorded in Winter Survey Period 2: 2008/2009
- Swan sites recorded in Winter Survey Period 3: 2009/2010
- Swan sites recorded in Winter Survey Period 4: 2010/2011
- Swan sites recorded in Winter Survey Period 5: 2011/2012
- Swan sites recorded in Winter Survey Period 6: 2012/2013
- Swan sites recorded in Winter Survey Period 7: 2013/2014

NOTE:  
Multi-year/period observation dots stacked.  
Thickness of Route Line not to scale. Actual Route Corridor much narrower.

Scale @ A3: 1:160,000  
0 0.5 1 2 3 4 5  
Kilometres

Issue	Date	Description	By	Chkd
B	DEC 2014	Issued	G.F.	O.McA
A	JAN 2014	Issued	M.S.	E.C

**NOTES**

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
3. WHOOPER SWANS DATA BASED ON SITE SURVEYS



Client:  
Project:  
NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT

Title:  
WHOOPER SWAN DISTRIBUTION

Prepared by: G.Fil  
Checked: O.McAlister  
Date: December 2014

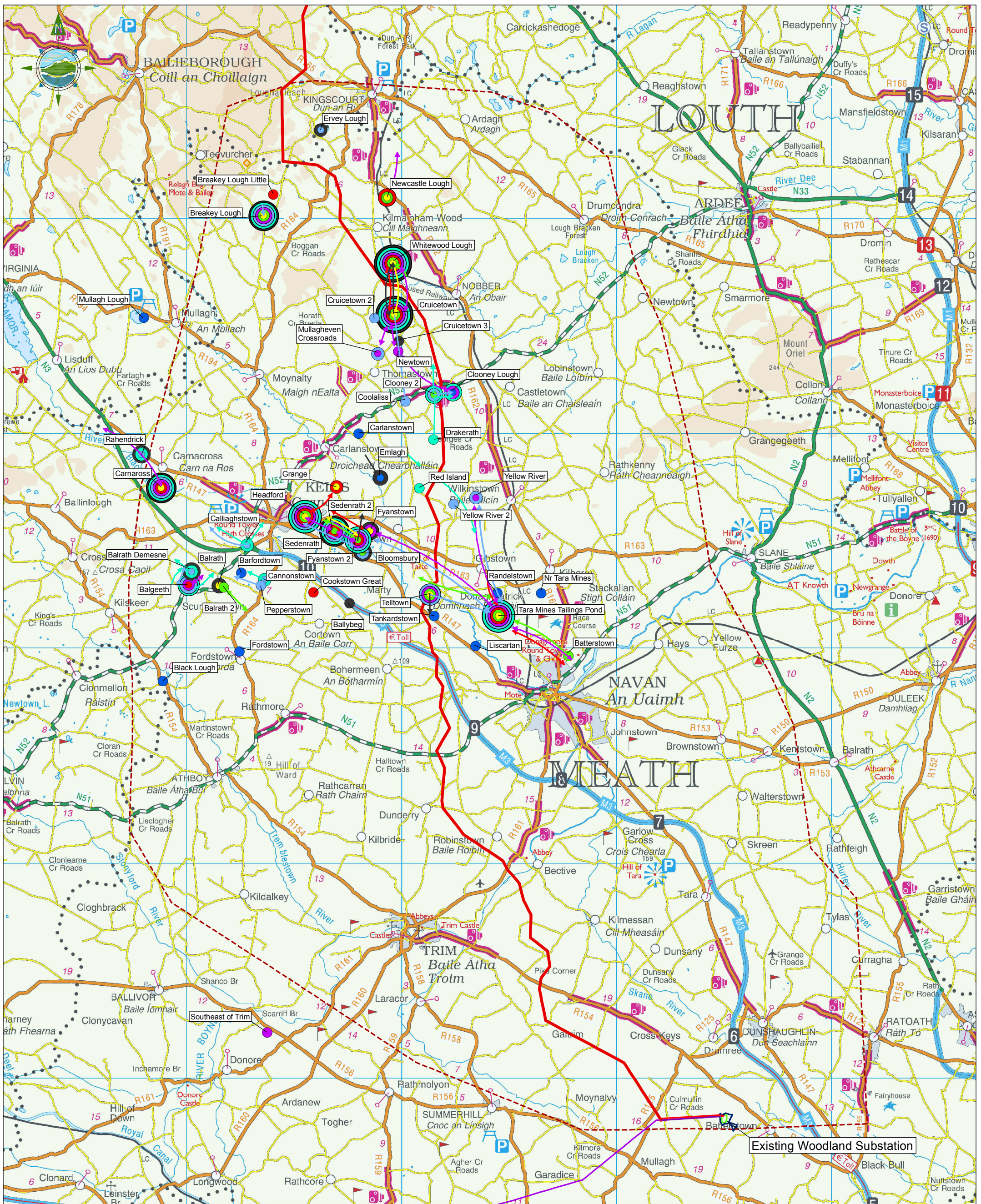
Project Director: Damien Grehan



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6244 FIGURE 5.7 (MSA) Issue: B





**Legend**

- Meath Study Area (MSA)
- Proposed Line Route

- Historical Swan site
- Swan sites recorded in Winter Survey Period 1: 2007/2008
- Swan sites recorded in Winter Survey Period 2: 2008/2009
- Swan sites recorded in Winter Survey Period 3: 2009/2010
- Swan sites recorded in Winter Survey Period 4: 2010/2011
- Swan sites recorded in Winter Survey Period 5: 2011/2012
- Swan sites recorded in Winter Survey Period 6: 2012/2013
- Swan sites recorded in Winter Survey Period 7: 2013/2014
- Flight Lines 2007/2008
- Flight Lines 2008/2009
- Flight Lines 2009/2010
- Flight Lines 2010/2011
- Flight Lines 2011/2012
- Flight Lines 2012/2013
- Flight Lines 2013/2014

NOTE: Multi-year/period observation dots stacked. Thickness of Route Line not to scale. Actual Route Corridor much narrower.

Scale @ A3: 1:160,000  
0 0.5 1 2 3 4 5  
Kilometres

Issue	Date	Description	By	Chkd
B	DEC 2014	Issued	G.F.	O.McA
A	JAN 2014	Issued	M.S.	E.C

**NOTES**

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
- WHOOPER SWAN DATA BASED ON SITE SURVEYS

Client:

Project: NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT

Title: WHOOPER SWAN DISTRIBUTION FLIGHT LINES

Prepared by: G.Fil  
Checked: O.McAlister  
Date: December 2014

Project Director: Damien Grehan

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6244 FIGURE 5.8 (MSA) Issue: B



### 5.2.3 Potential Impacts to Whooper Swan in the Study Area

52 The assessment of potential impacts and effect on Whooper Swan populations was informed by the following:

- Seven years of winter bird studies conducted to gather evidence on flightlines, numbers, local concentrations and evidence of ringed birds (which can be used to identify bird movements).
- Potential displacement and collision impacts were informed by observed interactions of swans (Mute, Whooper and Bewick) and geese (species) with powerlines and wind turbines, existing published scientific information, EISs for similar type developments and consultation with relevant experts (including Royal Society for Protection of Birds and BirdWatch Ireland).
- Swans are identified as a species group highly susceptible to collision with powerlines ((EirGrid (2012<sup>30</sup>); Becker & Lichtenberg (2005<sup>31</sup>)). There are likely to be increased collision risks to juvenile and less experienced birds, in particular during periods of poor visibility (e.g. at night and during misty conditions) (Hunting, 2002<sup>32</sup>).
- Geese species including Greylag and Pink-footed were the subject of a specific transmission line interaction study, refer to MBEC<sup>33</sup> (2006). The appraisal in this NIS (and the ecology assessment in the EIS) was informed by surveys conducted of bird collision mortalities along an existing 400 kV line in Scotland. The sites surveyed were locations where geese (species) concentrated, and fly regularly over 400 kV and 220 kV transmission lines. Sites surveyed support internationally important numbers of Greylag and Pink-footed Geese (relatively similar species in terms of potential susceptibility to collision with transmission lines). No signs were ever noted of geese or indeed swans (present in the area) colliding with transmission lines, despite regular flights observed across transmission lines in this study. Species recorded as colliding with transmission lines during these surveys included common species such as Grey Heron and species not present in the MSA e.g. Guillemot (sea bird).
- Whooper Swan (and Mute Swan) interaction with existing transmission lines has been observed in counties Mayo, Monaghan and at Toome Bridge in Northern Ireland. Whooper Swan have been observed flying over and foraging close by, beside and

<sup>30</sup> EirGrid (February 2012). *Ecology Guidelines for Electricity Transmission Project – A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects*. Available: <http://www.eirgrid.com>

<sup>31</sup> Becker M.D & Lichtenberg J.S. (2005). *Selected Papers of the 20th Trumpeter Swan Society Conference, Trumpeter Swan Restoration: Exploration and Challenges*, Iowa. Retrieved from: [http://www.trumpeterswansociety.org/docs/20th\\_conf/20becker\\_and\\_lichtenberg.pdf](http://www.trumpeterswansociety.org/docs/20th_conf/20becker_and_lichtenberg.pdf).

<sup>32</sup> Hunting, K. 2002. *A roadmap for PIER research on avian collisions with power lines in California*. California Energy Commission.

<sup>33</sup> The author of this NIS was a co-author of the MBEC McKenzie Bradshaw (2006). *Bird - Power Line Collision Field Study*. Prepared for Scottish and Southern Energy plc.

under transmission lines. These observations and surveys serve as an indication that Whooper Swans may habituate to transmission lines.

- A number of observed sites in Northern Ireland support internationally important numbers of Whooper Swan (e.g. Toome Bridge area – near Lough Neagh SPA). Toome Bridge in particular, supports internationally important numbers of Whooper Swan which regularly forage and flyover a 275 kV transmission line which was constructed between 1963 and 1978 (source Northern Ireland Electricity). While occasional collisions occur (source, RSPB), these areas have been recently marked with flight diverters and the area continues to support a thriving population of Whooper Swan (Hall *et al.*, 2012<sup>34</sup>) at favourable conservation status.
- Studies conducted in the Netherlands (Fijn *et al.*, 2012<sup>35</sup>) on wintering swans found low levels of collision mortality within wind farm developments (and associated electricity infrastructure), even in sites with a high degree of transit flights through operational wind farms and relatively high numbers (>500) of birds regularly present. In a review of swan and goose fatalities at wind farms, only two Whooper Swans were recorded as fatalities from monitoring undertaken at 46 different wind farms across eight countries (Rees 2012<sup>36</sup>). Wind farms, similarly to transmission lines, present an identifiable collision risk to birds including Whooper Swan. However, research (such as the research identified above) indicates that actual collision risk from wind farms is very low even where wintering swans concentrate and regularly fly over.
- During the course of the Whooper Swan study conducted in Meath and Monaghan (2007–2014), signs of Whooper Swan and or Mute Swan collisions with distribution lines were observed at various locations (including two sites near Ballybay and the Cruicetown site in the MSA). This is consistent with general (non-published) observations that low and mid voltage lines close to (within 500m) concentrations of wintering swans are a localised collision hazard.
- The Icelandic Whooper Swan population (population which winters in Ireland) is considered to be at favourable conservation status (source: JNCC<sup>37</sup>) and populations in Ireland increased between 2000 and 2005 by 11% (Crowe *et al.* 2005<sup>38</sup>) and by 6%

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<sup>34</sup> Hall C, Glanville J. R., Boland H, Einarsson O, McElwaine G, Holt C. A., Spray C. J., Rees E. R. (2012). Population Size and Breeding Success of Icelandic Whooper Swan *Cygnus Cygnus*; Results of the 2010 International Census. Wildfowl 62:73-96, Wildfowl & Wetlands Trust, Slimbridge, Gloucestershire.

<sup>35</sup> Fijn, R., Krijgsveld, K., Tijssen, W. s.l (2012). *Habitat use, disturbance and collision risks of Bewick's Swans Cygnus columbianus bewickii wintering near a wind farm in the Netherlands*. Wildfowl, 69:97-116, Wildfowl & Wetlands Trust, Slimbridge, Gloucestershire.

<sup>36</sup> Rees, E.C (2012). *Impacts of Wind Farms on Swans and Geese: a Review*. Wildfowl, 62:37-72, Wildfowl & Wetlands Trust, Slimbridge, Gloucestershire.

<sup>37</sup> <http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-16.pdf>

<sup>38</sup> Crowe O, McElwaine JG, Worden J, Watson GA, Walsh A & Boland H. (2005). *Whooper Cygnus cygnus and Bewick's C. columbianus bewickii Swans in Ireland: Results of the International Swan census, January 2005*. Irish Birds 7(4):483-488.

between 2005 and 2010 (Boland *et al.* 2010<sup>39</sup>), notwithstanding the already extensive transmission and distribution line infrastructure which they may potentially collide with.

- Observations of Whooper Swan flocks (between 2007 and 2014) in MSA and CMSA, noted good recruitment of juveniles to flocks observed with regular observations of adults with larger broods (3+ fledged juveniles) in recent years indicating that the population is recruiting. Whooper Swans continue to concentrate in areas even where distribution and transmission line infrastructure cross nationally or county important sites.
- A submission received from NPWS as part of a previous application for approval for this proposed project identified and acknowledged that collision impacts on Whooper Swan may arise at a local level, however, it is unlikely that the national population or any SPA population will be impacted.
- APLIC, 1994 and 2012<sup>40</sup> cites that collisions with transmission lines “*are not a biologically significant source of mortality for thriving bird populations*”. The Whooper Swan population in Ireland is increasing based on current data and can be considered as being at favourable conservation status.

53 Based on the information summarised above it is considered highly unlikely that, even in the absence of mitigation measures, the proposed development will give rise to significant impacts to Whooper Swan populations and sub populations in the MSA during the operational phase. The key approach therefore in the appraisal is to identify local areas where a moderate or less adverse impact could arise.

### 5.2.3.1 Potential Collision Impacts Identified along the Alignment

54 The approach in this evaluation was to identify areas with relatively regular yearly and inter year Whooper Swan flightlines which are bisected by the route of the proposed alignment and also to consider the location of observed flocks relative to the proposed alignment. Whooper Swan site usage differs somewhat to the most important areas in study area as Whooper Swans are clustered in distribution at lake sites which provide both roost and forage opportunities without the requirement for extensive daily flights (in most cases). This means flights are sporadic and irregular. Where flights were observed these were generally at heights at or just above hedgerow / treeline height (15 - 20m). This height would be within the height range of the lowest conductors which range from 39.5m at the tallest proposed tower down to 9m at the point of maximum sag (the 9m maximum sag would rarely arise as it would only occur at maximum

<sup>39</sup> Boland H, McElwaine J, Henderson G, Hall C, Walsh A & Crowe O (2010). *Whooper Cygnus cygnus and Bewick's C. columbianus bewickii Swans in Ireland: results of the International Swan Census, January 2010*. Irish Birds 9: 1-10 (2010).

<sup>40</sup> Avian Power Line Interaction Committee (APLIC) (1994). *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*. Avian Power Line Interaction Committee (APLIC) (2012) *Reducing Avian collisions with Power Lines: The State of the Art in 2012*.

operating conditions, typically the lowest most conductor would be some metres higher than this at its lowest point ). Based on the scientific literature Whooper Swan flight behaviour is such that they tend to fly over the highest conductors, and in this regard the greatest risk of collision is associated with collision with the earth (shield) wires (APLIC, 2012). These are located above the conductors and as they are thinner than the conductors, can be less visible. The typical height of the earth wires range from 50 m at the tallest proposed tower down to 19.5 m at the point of maximum sag.

- 55 Based on the results of the flightline surveys between 2010 and 2014 (findings of which are consistent with survey findings noted prior to this); the following evaluation is made regarding the regularity of flightlines and assessment of whether a potential impact will arise.
- 56 Based on the field survey conducted, potential collision risks are identified as being at specific key areas along the proposed development in the CMSA and MSA. These areas include:
- At Ballintra (500m west of Tower 143) a regular flight line was confirmed between this feeding area and two small lakes namely Loughs Tonyscallan and Toome or Crinkill which are located approximately 1.5km and 2km east and south east of Ballintra respectively. This flightline crosses the alignment.
  - Whooper Swans disperse between Loughs Comertagh, Mill and Raferagh (section of alignment between Towers 197 and 200) throughout the winter. They also occasionally use two further lakes close by – Loughs Greaghlonge and Corvally (observed in 2013 / 2014 only). Hence unconfirmed relatively irregular flightlines cross the alignment.
  - Loughs Morne and Egish (section of alignment between Towers 161 and 163). Very few Whooper Swans irregularly utilise these lakes even though these lakes are bisected by the alignment. It is considered that risks to Whooper Swans are relatively low at this location although occasional flights do occur.
  - The River Blackwater Crossing - The alignment bisects a regularly used flightline between Tara Mines Tailings Pond (roost site) and foraging areas in the River Blackwater Valley. The sites observed as linked by flightlines to Tara Mines Tailings Ponds include Yellow River, River Blackwater Valley (Fyanstown, Sedenrath, Fyanstown 2, Bloomsbury and Teltown) and irregularly used sites north and east of here (e.g. Batterstown, Nr Tara Mines and Randelstown). The Blackwater Valley sites detailed require crossing by Whooper Swan of the proposed alignment while the other sites avoid crossing. The Yellow River site and other potential areas north and east of Tara Mines Tailings Pond avoid crossing by Whooper Swan of the alignment.
  - The area near Clooney Lough – The alignment passes through an extensive open agricultural landscape where potatoes are grown, at scattered locations, which attracts

Whooper Swan. The locations used and hence flightlines are highly variable and depend on crop rotation (farm management), flooding and alternative food source availability. Roost sites are limited and were observed to be primarily local flooding, Cruicetown and unknown areas to the east of the alignment. The typical height of earth wires range from 49.83m at the tallest proposed tower to 19.83m at the point of minimum sag.

- The alignment east of Cruicetown –The sites observed as linked by flightlines to Cruicetown include Whitewood Lough, Newtown, Mullagheven crossroads, Cruicetown 2 and Cruicetown 3. The alignment bisects a relatively regularly used flightline (observed most years including 2013 / 2014) between Whitewood Lough (roost site) and foraging / roost area at Cruicetown, while the other sites avoid crossing.
- A potential collision risk may additionally arise in the Yellow River area between Towers 291 and 295. The Yellow River area is relatively regularly used (not every year) by large flocks of Whooper Swan. These birds were observed to roost at Tara Mines Tailings Ponds and flightlines observed did not cross the alignment. This important foraging area is quite close to the alignment and in this regard it is likely that some birds may cross the alignment. While no flights crossed the alignment flights were observed in close vicinity (<1km) and this is a relatively regularly used site by numbers which reach national importance. In this case it is considered that mitigation is warranted.
- Other areas where Whooper Swan were observed close to the alignment (< 2km) include sites that Whooper Swan used temporarily due to short term favourable conditions. The suitability of these areas was dictated by land management activities and rainfall. They include Drakerath (2012 records only), Clooney Lough area (including Coolaliss and Clooney 2 sites) and Red Island farmland. While observed Whooper Swan at Drakerath stayed for an extended period in 2012 foraging and roosting was observed on the site and no flightlines were observed. In this regard Whooper Swan are unlikely to collide with the alignment and impacts are considered imperceptible at this location.

57 The assessment of potential collision impacts is based on the identified flightlines and their regularity. Estimates of avian collision rates with powerlines from a range of other studies were reviewed (Erickson et al, 2001<sup>41</sup>; Hunting, 2002<sup>42</sup>; SPSSE<sup>43</sup>, 2006). In particular Hunting (2002) provides a comprehensive review of studies which have examined the factors contributing to collision risk with powerlines. Based on his review of research there is some evidence to

<sup>41</sup> Erickson, W.P., Johnson, G.D., Strickland, M.D., Young, D.P., Sernka, K.J., Good, R.E. 2001. Avian Collisions with Wind Turbines: A summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States. National Wind Coordinating Committee (NWCC) Resource Department.

<sup>42</sup> Hunting, K. 2002. A roadmap for PIER research on avian collisions with power lines in California. California Energy Commission.

<sup>43</sup> Scottish Power and Scottish and Southern Energy (SPSSE) (2006). Proposed Beaulay to Denny 400kV Overhead Transmission Line. Scottish Power and Scottish and Southern Energy.

suggest that juvenile birds can be more susceptible to collision than adults and there is strong evidence to indicate that weather / visibility is a key factor increasing collision risk. Studies varied in their methodologies and target species however reported collision rates quoted ranged from <0.001 to 0.74%. With regard to the final appraisal, a 'worst-case scenario' of 1% is taken. The magnitude of this impact is considered low following Percival (2003<sup>44</sup>). Based on existing research information and observations at existing transmission lines, Whooper Swan will continue to use this area and will habituate (fly over) the alignment. A low level of collisions may potentially occur with conductors / earth wire, in particular during the short term, before mature Whooper Swan habituate. Collision risk is likely to be higher for immature birds and during periods of poor visibility. Mitigation proposed in **Section 6** for key areas identified will reduce collision risk.

### 5.2.3.2 Summary

58 Areas where flightlines occur between roost and foraging areas have been identified and, as set out in Section 6 below, mitigation in the form of flight diverters is proposed in these areas to address potential collision impacts.

### 5.2.4 Potential Impacts and Effects to Whooper Swan populations of European Sites

59 Studies of Whooper Swan movements have identified potential effects from the proposed development as being restricted to a local scale at specific locations including the Blackwater River Valley. From these studies, it was also concluded that Whooper Swans tend to locate for extended periods (weeks), in relatively distinct areas (e.g. within 3km of Balrath Demesne, within 7km of Tara Mines Tailings ponds and within 5km of Cruicetown Estate). All these areas are well removed from the relevant European Sites. The section above assesses the potential effects of collision and displacement on local Whooper Swan populations and mitigation measures to ameliorate these effects through the installation of bird flight diverters are presented in **Section 6**. No significant residual effects are expected to Whooper Swan at the local scale associated with the proposed development.

60 The assessment of potential significant effects to migrating Whooper Swan flightlines linked to relevant European Sites is informed by the following:

- Over the course of seven years of wintering bird surveys, no birds ringed in any SPA have ever been recorded in the study area (in that ringed bird records would infer bird movements/connections between SPA sites and the study area). The findings of the surveys conducted identified that daily flightlines of these locally occurring flocks in the

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<sup>44</sup> Percival, S.M. (2003). *Birds and wind farms in Ireland: A review of potential issues and impact assessment*.

study area do not extend beyond approximately 15km and most flightlines are much less than this.

- Most recent evidence on the foraging distances of Whooper Swan during the winter season indicates that a core foraging range of 5km be considered in determining movements of birds outside of SPAs and thus determining possible connections with SPAs for this species (SNH, 2013<sup>45</sup>). However, there is some limited evidence to suggest that where foraging opportunities become limited within this core range, greater distances of up to 30km can be covered for foraging birds (Pendlebury *et al*, 2011)<sup>46</sup>. Observations during the 7 years of wintering bird surveys for the project indicate a maximum daily flightline of < 15km in Co Meath only (southern section of route). The maximum flights observed in Co Monaghan (northern section of route nearest SPA) are much lower (maximum 2km observed).
- Consultation with NPWS highlighted that significant impacts to the National population of Whooper Swan or any SPA for the species were unlikely to arise from the proposed development. It is acknowledged that the development has the potential to impact on this species at a local level, through a possible collision risk posed by the transmission line.
- Migration routes between the relevant European site (flights between Lough Erne, Lough Foyle, Lough Swilly, Lough Oughter or Lough Neagh) do not require crossing of the alignment of the proposed development in Ireland.
- The Irish Whooper Swan Study Group have been researching movement patterns throughout Ireland for nearly 20 years, through monitoring the re-sightings of individually marked whooper swans (Hall *et al*, 2012<sup>47</sup>). In the last swan census (2010), the highest numbers of swans were recorded from Lough Neagh and Lough Beg, Lough Foyle and Upper Lough Erne. The Lough Swilly/Lough Foyle Complex is known as a major autumn and spring staging ground for the species (McElwaine *et al*, 1995<sup>48</sup>; Robinson *et al*, 2004<sup>49</sup>). Swans also 'stage' in the UK before moving to Ireland - peak numbers in Scotland generally occur during the late autumn and decline gradually through the winter as birds move to Ireland and to wintering areas in southern Britain.

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<sup>45</sup> Scottish Natural Heritage (2013). *Assessing Connectivity with Special Protection Areas (SPAs)*.

<sup>46</sup> Pendlebury, C., Zisman, S., Walls, R., Sweeney, J., McLoughlin, E., Robinson, C., Turner, L. & Loughrey, J. (2011). *Literature review to assess bird species connectivity to Special Protection Areas*. Scottish Natural Heritage Commissioned Report No. 390.

<sup>47</sup> Hall C, Glanville J. R., Boland H, Einarsson O, McElwaine G, Holt C. A., Spray C. J., Rees E. R. (2012). Population Size and Breeding Success of Icelandic Whooper Swan *Cygnus Cygnus*; Results of the 2010 International Census. *Wildfowl* 62:73-96, Wildfowl & Wetlands Trust, Slimbridge, Gloucestershire.

<sup>48</sup> McElwaine, J.G., Wells, J.H. and Bowler, J.M. 1995. *Winter movements of Whooper Swans visiting Ireland: preliminary results*. *Irish Birds* 5: 265-278.

<sup>49</sup> Robinson, JA, K Colhoun, JG McElwaine & EC Rees. (2004). *Whooper Swan Cygnus cygnus (Iceland population) in Britain and Ireland 1960/61 – 1999/2000*. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge

Birds in Ireland also move southwards through the winter, travelling from the staging sites of Lough Swilly and Lough Foyle further south. However birds do not always make landfall at the nearest landmass and many travel directly to wintering sites. Interchange of birds between Britain and Ireland and vice versa, continues to take place in winter. Tracking (satellite) records for whooper swan available on the WWT website, and also described in Griffin *et al* (2010)<sup>50</sup> and Griffin *et al* (2011)<sup>51</sup> were examined and any records relevant to the island of Ireland were extracted and are presented in **Appendix C**.

- 61 Potential effects to the conservation status of Whooper Swan, which are a qualifying interest of these SPA sites remote from the alignment of the proposed development in counties Monaghan, Cavan and Meath, and any potential effects to the overall integrity of the sites or the structures and functions that support them, are discussed in more detail below.

#### 5.2.4.1 Upper Lough Erne

- 62 Upper Lough Erne is one of the top three internationally important sites for Whooper Swan on the Island of Ireland. Numbers at this site typically build up in the autumn and continue to increase through the winter, indicating that the site may act as a staging area for whooper swan moving north in spring (Robinson *et al*, 2004<sup>52</sup>). However the most recent WEBS data available on the BTO website show that the peak in numbers in the 2012/2013 season occurred in December, which indicates a typical overwintering pattern to swan numbers rather than a pattern associated with a typical staging site.
- 63 As detailed in **Section 5.2.2** only local scale flightlines were recorded during field studies and no ringed birds from SPA sites were recorded. Of the tracked (satellite) swan records available (**Appendix C**), there is no indication that there are flightlines between the Upper Lough Erne site and the local populations in study area, or that migratory flightlines cross the route of the proposed alignment.
- 64 Therefore, the Whooper Swans associated with the study area are considered a separate population from that of the Upper Lough Erne SPA which is some 27km distance at the nearest point. This SPA is remote from the development area, however occasional flightlines may cross the alignment. In particular return spring migration flights from the local sites in the eastern parts of the study area to this 'staging' site have the potential to cross the alignment, although it is considered more likely that these birds would fly north parallel to the alignment to

<sup>50</sup> Griffin, L; Rees, E & B. Hughes (2010). *Whooper Swan Cygnus Cygnus migration in relation to offshore wind farms*. BOU Proceedings – Climate Change and Birds.

<sup>51</sup> Griffin, L; Rees, E & B. Hughes (2010). *Migration routes of Whooper Swans and geese in relation to wind farm footprints*. Final Report to DECC. November 2001. WWT.

<sup>52</sup> Robinson, JA, K Colhoun, JG McElwaine & EC Rees. (2004). *Whooper Swan Cygnus cygnus (Iceland population) in Britain and Ireland 1960/61 – 1999/2000*. Waterbird Review Series, The Wildfowl & Wetlands Trust/Joint Nature Conservation Committee, Slimbridge

other staging sites (e.g. Lough Neagh or directly to Iceland). It is considered therefore that, in the light of best available scientific knowledge, the proposed development by itself or in combination with other plans or projects will not adversely affect the Whooper Swan population of Upper Lough Erne SPA.

65 No specific mitigation is required other than that proposed for the local populations.

#### 5.2.4.2 Lough Oughter and Associated Loughs

66 Lough Oughter supports an internationally important population of Whooper Swan. Peak numbers from the 2012/2013 IWebs survey are above the threshold for international importance, although they had been below for the preceding four seasons.

67 As detailed in **Section 5.2.2** only local scale flightlines were recorded during field studies and no ringed birds from SPA sites were recorded. Of the tracked (satellite) swan records available (**Appendix C**), there is no indication that there are flightlines between this site and the local populations in study area, or that migratory flightlines cross the route of the proposed alignment.

68 The Whooper Swans associated with the study area are likely to be a separate population from that of the Lough Oughter and Associated Loughs SPA which is some 35km distant. This SPA is remote from the development area and the presence of the proposed development will not adversely affect the Whooper Swan population of Lough Oughter and Associated Loughs SPA. Any direct movements of swans between Lough Oughter and Lough Neagh have the potential to cross the Northern Ireland section of the proposed interconnector, therefore, the Northern Ireland portion of the development will be considered under potential In-combination effects.

69 It is considered that, based on the objective information collected and scientific knowledge available, that the proposed development will not result in any adverse effect on the Whooper Swan population of Lough Oughter and Associated Loughs SPA. No specific mitigation is required other than that proposed for the local populations.

#### 5.2.4.3 Lough Neagh and Lough Beg

70 Lough Neagh and Lough Beg SPA is the most internationally important site for Whooper Swan on the Island of Ireland. Numbers of whooper swan at this site tend to peak in March (Holt *et al*, 2012), with swans understood to arrive from the Lough Swilly/Foyle complex and from Scotland during the winter season (Robinson *et al*, 2004).

71 As detailed in **Section 5.2.2**, only local scale flightlines were recorded during field studies and no ringed birds from SPA sites were recorded. Of the tracked (satellite) swan records available

(**Appendix C**), there is no indication that there are flightlines between the Lough Neagh and Lough Beg site and the local populations in the study area, or that migratory flightlines cross the route of the proposed alignment. Migratory routes between Scotland and the Lough Swilly/Foyle complex were recorded, as were return migrations in spring; however none of these migration routes cross the proposed alignment.

- 72 The Whooper Swans associated with the study area are considered a separate population from that of the Lough Neagh and Lough Beg SPA which is some 36.7km distant. This SPA is remote from the development area, however occasional flightlines may cross the alignment. In particular spring migration from the local sites in the western parts of the study area to this 'staging' site have the potential to cross the alignment, although it is considered more likely that these birds would fly north parallel to the alignment to other staging sites (e.g. Lough Swilly/Foyle) or directly to Iceland.
- 73 It is considered that, based on the objective information collected and best scientific knowledge, that the proposed development will not result in any adverse effect to the Whooper Swan population of Lough Neagh and Lough Beg SPA. No specific mitigation is required other than that proposed for the local populations.

#### 5.2.4.4 Lough Swilly and Lough Foyle

- 74 There is a high level of interchange between the flocks in Lough Swilly and Lough Foyle. As the complex is used as both a staging and wintering area, numbers peak in autumn (late October/early November) and in spring (typically March)(Robinson *et al*, 2004). Holt *et al* (2012)<sup>53</sup> note that the February peak recorded at Lough Foyle during the last swan census in 2010 was not typical. The most recent WEBS data available on the BTO website show that the more typical trend of peak in numbers in the 2012/2013 season occurred in October.
- 75 However, both these sites are very remote from the study area being ca. 100km distant. As detailed in **Section 5.2.2**, no ringed (from SPA sites) or satellite tagged birds were recorded. Of the tracked swan records available (**Appendix C**), there is no indication that there are flightlines between the Lough Swilly and Lough Foyle site and the local populations in study area, or that migratory flightlines cross the route of the proposed alignment. Migratory routes crossing the Lough Swilly/Foyle complex to Lough Neagh and beyond to the UK were recorded, as were return migrations in spring, however none of these migration routes cross the proposed alignment.
- 76 This SPA is remote from the development area but occasional flightlines may possibly cross the alignment (in particular during autumn dispersal from these staging sites to local sites in the

<sup>53</sup> Holt, C.A., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Musgrove, A.J. 2012. Waterbirds in the UK 2010/11: The Wetland Bird Survey. BTO/RSPB/ JNCC, Thetford.

east of the study area). However, it is considered that, based on the best scientific knowledge in the field, the proposed development will not result in any adverse effect to the Whooper Swan population of Lough Swilly SPA and Lough Foyle SPA. No specific mitigation is required other than that proposed for the local populations.

### 5.2.5 Effect on the Conservation Status of Whooper Swan

77 Re-sightings of ringed birds confirm that birds regularly use the same sites between winters, although there may also be an element of wandering in the general area within winters (McElwaine *et al.* 1995<sup>54</sup>). Birds, once they have settled into their winter quarters, are therefore at little risk of collision with overhead lines, provided that roost and foraging sites are not separated by the lines. Collision risk at local sites has been identified and mitigation is proposed to avoid any significant effects to local populations. Movements of birds associated with migrations to and from staging sites will only occur once during autumn and once during spring. Most of these movements are likely to be sub-parallel to the line with low potential for collision. A low number of other random movements of birds crossing the line to UK sites may also occur (see Bird ID 'CPA, **Appendix C**). As for the collision risk identified for local populations, a collision rate of 1% is considered a worst case scenario. Furthermore adverse effects at the population level have been modelled to require annual removal of greater than 3% of a population of Whooper Swan that is increasing at its present rate, in addition to the mortality that is occurring at present (Trinder 2012<sup>55</sup>). For the Irish population of Whooper Swan this would equate to ca. 314 birds. Given the low numbers of migratory flights of SPA birds expected to cross the alignment, any effects arising from collisions on the population of whooper swan associated with any SPA are likely to be negligible, if any, and any mortality arising from collisions will not affect the integrity of the relevant European sites or the conservation objectives as they relate to Whooper Swan.

### 5.2.6 Dundalk Bay SPA

78 There is a limited possibility that Great Crested Grebe breeding in the study area may overwinter in this SPA. During Winter Survey Period 'WSP' 7 (2013-2014) 8 sites in the CMSA supported breeding Great Crested Grebe. Of these sites 5 were west of the alignment and therefore the alignment is potentially crossed by Great Crested Grebe moving to/from this SPA site. Each of these 5 sites supported just one pair of Great Crested Grebe. Three of these sites also supported wintering Great Crested Grebe the following season indicating that this species may remain in the study area. If they overwinter at Dundalk Bay SPA it is estimated that maximum of 10 birds will fly across the alignment on occasional migratory flights, if at all. During WSP7, in the MSA, breeding Great Crested Grebe were recorded at 4 sites, 3 of which

<sup>54</sup> McElwaine, J.G., Wells, J.H. and Bowler, J.M. 1995. *Winter movements of Whooper Swans visiting Ireland: preliminary results.* Irish Birds 5: 265-278.

<sup>55</sup> Trinder, M. 2012. The potential consequences of elevated mortality on the population viability of whooper swans in relation to wind farm developments in Northern Scotland. *Scottish Natural Heritage Commissioned Report No.459*

are east of the alignment, with the remaining site west of the alignment supporting 1 pair of this species (i.e. only 2 birds potentially crossing the alignment).

79 This species is considered a highly collision prone species (EirGrid, 2012). Numbers of Great Crested Grebe in Dundalk Bay have historically fluctuated widely, halving or doubling between months<sup>56</sup>. It is suggested in the Conservation Objectives Supporting Documentation that such variability may result from movements to inland sites amongst other factors. The conservation status of this species in Dundalk Bay is currently considered moderately unfavourable. It is noted that no flightlines were recorded crossing the alignment during field studies, and ringed birds were not recorded.

80 Given a 'worst-case' collision risk of 1% of the local population (as per rationale followed for Whooper Swan above) and the low abundance of this species in the study area, any effects arising from collisions on the population of Great Crested Grebe associated with Dundalk Bay SPA are likely to be negligible, if any, and any mortality arising from collisions will not affect the integrity of this site or the conservation objectives as they relate to Great Crested Grebe.

## 5.2.7 Potential In-Combination Effects

81 A review of plans and projects was conducted which included consideration of location, potential impacts to qualifying interests, mitigation measures and residual impacts.

### 5.2.7.1 The SONI Proposal

82 The potential cumulative impacts with the SONI proposal (Tyrone and Cavan) require consideration.

83 The SONI Proposal, in Northern Ireland, comprises separate elements that have been made subject to two separate planning applications:

- The proposed overhead line and substation;
- The construction and operation<sup>57</sup> of a new 275 / 400kV substation at Turleenan townland, north east of Moy, County Tyrone;
- The removal of an existing 275kV suspension tower and the construction and operation of two new 275kV terminal towers to enable connection of the Turleenan substation to an existing 275kV overhead line; and

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<sup>56</sup> NPWS (2011) Dundalk Bay SPA (004026) Version 1. Conservation Objectives Supporting Document.

<sup>57</sup> The System Operator Northern Ireland (SONI) will be operating the Proposed Development.

- The construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of approximately 34km from the source substation (at Turleenan) to a border crossing between the townlands of Doohat or Crossreagh, County Armagh and Lemgare, County Monaghan, where it will tie into the ESB network. Owing to geographic border definitions in the immediate area of the border crossing point, the overhead line will need to over-sail a portion of land within the Northern Ireland townland of Crossbane for a short distance.

84 The proposed “Associated Works” required for construction of the proposed overhead line and substation

- The formation of temporary access tracks, and other ancillary works associated with construction of the substation and the overhead line.

85 Potential impacts of the Overhead Line identified included:

- Direct physical loss, damage or changes to the integrity of the habitat or non-mobile species;
- Direct physical damage or alteration of commuting routes of mobile species;
- Disturbance to habitats or species;
- Emissions to Air;
- Emissions to Water;
- Emissions by Accidental Pollution Contamination; and
- Changes to Hydrology.

86 The Information to Inform Habitats Regulations Assessment identifies that potential impacts (without mitigation) on European site features arising from the SONI proposal are restricted to the following sites:

- Lough Neagh and Lough Beg SPA - Potential collision of small numbers of migrating, dispersing or commuting Whooper Swans with the proposed overhead line during operation;

- Lough Neagh and Lough Beg Ramsar site – Potential contamination of wetland habitats and pollan population via discharges into the Blackwater River during construction and operation;
- Lough Oughter Complex SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation, principally when birds are relocating from the Lough Neagh staging area;
- Lough Foyle SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation; and
- Lough Swilly SPA - Potential collision of small numbers of migrating or dispersing Whooper Swans with the proposed overhead line during operation.

87 Cumulative and in-combination effects arising from the SONI Proposal and its extension into Ireland are largely restricted to a potential to increase collision mortality of whooper swan (a designated feature of assessed sites). However migratory movements for both the SONI Proposal and the proposed development have been identified as occurring primarily parallel to the proposed interconnector development, with only limited potential for crossing the SONI proposal on route to and from Lough Neagh. As key flightlines identified relative to the proposed development are associated with local populations and have been mitigated for with flight diverters, no significant cumulative effects on the Whooper Swan populations are anticipated.

88 Mitigation measures incorporated into the design of the proposed development are as follows:

- Bird flight diverters are to be installed on the earth wire between towers 1-13 and 30-43;
- The overhead line will be monitored for collision casualties post-construction and local landowners will be encouraged to report casualties; and
- Modifications will be made if required to deflector type and location arising from monitoring observations.

89 The assessment concluded that there is no potential for significant impacts to the Whooper Swan populations of the European Sites considered, arising from the SONI proposal, alone or in-combination with other plans or projects. The assessment of in-combination effects included the consideration of the proposed development.

### 5.2.7.2 Windfarm Projects

- 90 It was confirmed that localised water pollution controls (as identified herein) are a key consideration for the project, therefore a focus of the cumulative impact assessment is to seek to minimise additional potential pollution loads to the River Boyne and River Blackwater cSAC and SPA.
- 91 Other projects identified in **Table 4.1** considered to have the potential to result in cumulative impacts include:
- Teevurcher Wind Farm Development. This is a windfarm development located partly in the River Boyne catchment.
  - North Meath Wind Farm Development Limited: This extensive windfarm development proposal occurs close to the proposed development at Emlagh. The residual impacts identified in the EIS and NIS for the Emlagh Windfarm Development in relation to aquatic ecology including European sites common to this proposed development are not significant i.e. the conservation status of ecology receptors in receiving waters will not be affected.
- 92 Residual impacts identified in EIS and NIS for these projects were reviewed to inform the appraisal for potential adverse effects on the integrity of the relevant European sites. In this respect, it is significant that the identified projects have appropriate and effective mitigation designed for avoiding adverse effects to the relevant European sites.
- 93 In conclusion, it is considered that no significant cumulative effects will arise to relevant qualifying interests from the proposed development in-combination with the permitted and proposed development detailed.
- 94 However, in order to attain certainty, further consideration is required in respect of potential localised water quality impacts associated with the construction stage of the proposed development in-combination with all other general pollution sources in the River Boyne and River Blackwater cSAC and SPA catchment area. Overall water quality is a key parameter for the preservation of favourable conservation status for aquatic qualifying interests at this site (including salmon and lamprey). The water quality in the Boyne and Blackwater and tributaries is variable, but in general ranges between being of Good (Q4) to Moderate status (Q3-4) (EPA Envision, 2013).
- 95 In this regard water quality protection measures during the construction stage are identified as a key consideration for the project so as not to add to temporary pollutant loads in relevant river systems (River Boyne and River Blackwater and associated tributaries) in-combination with other projects / plans / and existing land uses which influence water quality (e.g. agriculture,

forestry, waste water etc.). These mitigation measures are noted in Table 5.2 and are detailed in Section 6 of this report.

### **5.2.7.3 Existing Distribution Line and Telecommunications Line Crossings**

96 The proposed North-South 400 kV Interconnection Development crosses other existing transmission, distribution and telecommunications lines. These locations have been reviewed with regard to their ecological value and potential for cumulative impacts to arise on any European Site. There are 59 no. roadside locations where the proposed 400 kV route crosses existing OHL telecommunications lines. A total of 7 of these lines are located along roadsides within 500m of designated rivers or non-designated tributaries (between spans 251-252, 309-310, 311-312, 313-314, 317-318, 353-354 and 363-370), however due to the nature and scale of these works no significant cumulative effects will arise. Electricity distribution lines will be undergrounded at 11 no. identified crossing points. There is potential for localised water quality in-combination impacts to arise at one location in the vicinity of Tower 313 where a 10kV cable is being undergrounded in the vicinity of a tributary of the River Boyne. Water quality protection measures will be required to avoid any cumulative adverse effect. These mitigation measures are noted in Table 5.2 and are detailed in Section 6 of this report.

## 6 MITIGATION MEASURES

- 1 As part of a Stage Two AA, the competent authority must consider mitigation measures necessary to avoid, reduce or abate potentially adverse effects. Indeed, the European Commission Guidance (2000) details how mitigation is a central part of the Appropriate Assessment process. Moreover, recent guidance emphasises the importance of mitigation. Avoidance or reduction of impacts at source should be the preferred options (European Commission Guidance 2000), and such a mitigation by avoidance strategy has been incorporated into the design of the proposed development. Mitigation measures are an integral part of the specifications of a plan or project and should be considered in the Appropriate Assessment by the competent authority.
- 2 Accordingly, this section of the NIS identifies mitigation measures aimed at minimising or, where practicable, avoiding any potential negative impact of the proposed development before, during or after its completion or implementation. The mitigation measures which have been developed and recommended for implementation shall ensure that the relevant European sites and their qualifying interests will not be subject to adverse effects. The Environmental Impact Statement (EIS) submitted with the application for approval (refer to **Volume 3** of the application documentation) has outlined an extensive suite of mitigation measures that have been proposed in order to minimise or eliminate the potential effects of the proposed development. This NIS has further refined these measures to ensure that the mitigation measures proposed by the developer and / or ultimately required by An Bord Pleanála (the Board) as competent authority will be implemented so as to ensure the absence of adverse effects on the integrity of the identified European sites (i.e. River Boyne and River Blackwater cSAC / SPA).
- 3 Based on the outcomes of these EIS and NIS appraisals, mitigation measures have been recommended at specific sensitive locations identified and detailed in **Table 5.2**. Moreover, the mitigation incorporated into the design of the proposed development and recommended for implementation in relation to the construction and operation stages are summarised below.

### 6.1 DESIGN STAGE MITIGATION (AVOIDANCE)

- 4 The following mitigation measures or criteria were included at the design stage of the proposed development:
  - No tower bases or other support elements of the development will be located within the boundary of the European sites (although conductors will oversail the sites). Tower bases and all associated construction activity will be located at least 50m from the river

boundary within the European Site and will be located outside the actual cSAC boundary. Riparian semi-natural habitat will be retained undisturbed.

- The transmission line oversailing locations are selected at a relatively narrow section of the European sites at each of the two river crossings.
- Towers and all associated construction activity will be located away from all tributaries of designated rivers.
- No in-stream or bankside works will be required within the European site or their tributaries.
- No vegetation clearance will take place within European sites oversailed by the proposed development (River Boyne and River Blackwater cSAC / SPA). The design of adjacent towers and sag of the lowest conductor wire is such that it rules out potential interference from vegetation, particularly at the Boyne crossing, and thus no cutting of vegetation is required. There is potential for tree cutting only at non-designated streams crossed and linked to the River Boyne and River Blackwater cSAC and SPA (main channel).
- Stringing of the transmission line will be conducted without a requirement to conduct works within the boundaries of the European sites and all stringing locations are at a remove from the European sites. All access by machinery will be marshalled so as to avoid habitats contained within the European site boundaries, such as river and riparian woodlands. Stringing of conductors across the European sites will be achieved by manually pulling (on foot) a light drawrope across the site and then using this drawrope to pull in a heavier draw wire from one tower to the next. Other than the transporting of the drawrope no work will be required at ground level in a European site.

## 6.2 CONSTRUCTION PHASE MITIGATION

- 5 The key potential effects identified during the construction phase of the proposed development are disturbance to protected fauna (Kingfisher and otter) breeding sites and potential localised perturbations to water quality (which has potential to adversely affect protected aquatic species including salmon and river lamprey) which have the potential to add to overall in-combination effects (with other projects / plans / land uses). In this regard specific mitigation measures for each of the identified relevant categories are detailed below.

- 6 A general mitigation measure is to employ an Ecological Clerk of Works (ECoW) on site during the construction phase. The ECoW will monitor all construction activities in the vicinity of the River Boyne and River Blackwater and will monitor and ensure the implementation and effectiveness of mitigation measures. In addition, all tributaries (refer to **Table 5.2**) will be monitored in the vicinity of the crossings in particular to ensure there is no disturbance to protected fauna (Kingfisher and otter breeding sites) and that reduction in water quality, which has potential to adversely affect salmon spawning sites, is also avoided. In the unlikely event of mitigation measures under performing or failing, emergency measures will be implemented to prevent impacts to designated sites / features (e.g. spill kits, bunding) and all works will cease. This will be coordinated by the ECoW. This feedback loop will ensure mitigation is responsive to any unexpected issues that arise and therefore the construction phase of the proposed development will not adversely affect the integrity of either European sites concerned.

### 6.2.1 Protection of Terrestrial Qualifying Fauna Breeding Sites

#### Kingfisher

- 7 Riparian areas at the following locations were identified as potential breeding sites for Kingfisher where disturbance of breeding sites associated with woody vegetation trimming / tree lopping may arise. These areas include:
- Boycetown River between Towers 376 and 377;
  - Stream between Towers 358 and 359;
  - Stream between Towers 350 and 351;
  - Clady River three crossings between Towers 344 and 347;
  - Small stream between Towers 313 and 314;
  - Small stream between Towers 317 and 318; and
  - Kilmainham River between Towers 251 and 252.
- 8 Confirmatory pre-construction surveys will be undertaken at watercourses linked to the River Boyne and River Blackwater, where tree felling may lead to potential disturbance to Kingfisher breeding sites, in order to avoid impacts to this species and to ensure that the description of the environment set out in the NIS and EIS remains accurate as at the time of construction. Such confirmatory surveying is required given the likely timescale between the date upon which planning approval might be granted and the commencement of construction activities in the material locations, given the dynamic nature / changes in Kingfisher breeding site locations. If

tree cutting is required at a breeding Kingfisher site, then this work will only take place once Kingfishers have finished breeding (as confirmed by ECoW) or outside the Kingfisher breeding season (typically March to end August). Thus, tree-cutting will be conducted in a manner which does not damage the breeding site / river bank through careful pollarding of tree limbs and retention of tree root structures and lower vegetation under which this species typically breeds.

### **Otter**

9 Riparian areas at the following locations were identified as potential breeding sites for otter where disturbance of breeding sites associated with woody vegetation trimming / tree lopping may arise.

- Boycetown River between Towers 376 and 377;
- Stream between Towers 358 and 359;
- Stream between Towers 350 and 351;
- Clady River three crossings between Towers 344 and 347;
- Small stream between Towers 313 and 314;
- Small stream between Towers 317 and 318; and
- Kilmainham River between Towers 251 and 252.

10 Again, in order to avoid impacts to otter, confirmatory pre-construction surveys will be undertaken at watercourses linked to the River Boyne and River Blackwater where tree felling may lead to potential disturbance to otter breeding or resting sites. Again, given the dynamic nature / changes in otter breeding site status / locations, such confirmatory surveying is required given the likely timescale between the date upon which planning approval might be granted and the commencement of construction activities in the relevant locations. If an otter breeding site is determined that may possibly be disturbed, then tree trimming activities will be suspended until such time that the otter breeding site is vacated and breeding activity is finished, as confirmed by ECoW. As stated above, tree trimming will be conducted in a manner which does not damage the breeding site / river bank through careful pollarding of tree limbs and retention of tree root structures and lower vegetation under which this species typically breeds.

## 6.2.2 Protection of Water Quality and Qualifying Aquatic Fauna

- 11 In order to mitigate potential impacts from water pollutants during the construction phase, all works associated with the construction of the proposed development will be undertaken with due regard to water quality protection. Mitigation measures to protect water quality have been incorporated into the outline *Construction Environmental Management Plan (CEMP)* for the proposed development, (included as Appendix 7.1, **Volume 3B** of the EIS). These mitigation measures to protect water quality will be implemented and are summarised below.
- 12 All site works and related activities, including temporary access routes, excavation of tower foundations and construction of towers and stringing will be conducted in an environmentally-responsible manner, so as to prevent any adverse impacts on water quality that may potentially occur as a result of works associated with the construction phase. The outline CEMP, and the detailed CEMP which will be produced by the contractor engaged to construct the proposed development (which will, itself, contain all mitigation measures set out in the outline CEMP and the Schedule of Mitigation Measures set out in the EIS) will be employed to ensure that all mitigation measures detailed in the EIS and NIS are implemented and that there is adequate protection and monitoring of the water environment. Thus, general construction practices will adhere to the requirements for the protection of fisheries habitat during construction and development works in the vicinity of river sites published by Inland Fisheries Ireland (IFI) (*Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*<sup>58</sup>). Sediment and pollution control measures will be also undertaken in all work areas located near drains and / or watercourses within catchments of European sites.
- 13 Accordingly, for the avoidance of doubt, the following mitigation measures (which are set out in the outline CEMP and Schedule of Mitigation Measures in the EIS) will be implemented in respect of specific works locations, including the towers in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA and will include a requirement to implement the following measures:
- Silt barrier / silt curtains will be used where towers are to be located and / or works are to be undertaken near watercourses, such as in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA. Correct installation of silt fences is vital and will be supervised by the construction manager and ECoW. The silt barrier / silt curtain will be shaped and installed so that it will catch runoff, without the water flowing underneath or around the edge. The silt barrier will be located down-gradient of the works and inspected on a regular basis including during and after rainfall events. For steep slopes, such as in the vicinity of Tower 355, more than one silt curtain will be used. The edges of the silt curtain will be turned upslope to prevent water going

<sup>58</sup> <http://www.fishingireland.net/environment/constructionanddevelopment.htm>

around the edges. Grips, sumps, straw bales and sediment traps will be installed to capture silt where applicable. Each of these will be maintained daily by the contractor to ensure that they remain effective and do not increase the likelihood of an incident occurring.<sup>59</sup>

- It is not anticipated that any localised groundwater dewatering will be required at tower construction locations in the vicinity of the two crossings of the River Boyne and River Blackwater cSAC and SPA. However, in the unlikely event that localised groundwater dewatering is required (at tower construction locations) potential impacts on the groundwater level will be realised only in close proximity to the point of abstraction. Any impacts will be restricted to the short period of pumping. The resultant water will be filtered before discharge. In such circumstances, groundwater will be filtered using bunds / tanks filled with filter material. Single sized aggregates 5–10 mm, geotextiles or straw bales can be used as a filter. Monitoring will be undertaken on the discharge water quality. Treated water discharged will be at a very small scale and can be discharged onto the adjacent field. No discharge will take place directly to water courses linked to European Sites.
- Precautionary measures will be taken to avoid spillages of contaminants including oils / fuels and concrete or cement (at tower construction sites). These include:
  - use of secondary containment, e.g. bunds around oil storage tanks;
  - use of drip trays around mobile plant;
  - supervising all deliveries and refuelling activities; and
  - designating and using specific impermeable refuelling areas isolated from surface water drains.
- With regard to on site storage facilities and activities, any raw materials and fuels, will be stored within bunded areas, to guard against potential accidental spills or leakages entering local watercourses linked to the European sites. All equipment and machinery will have regular checking for leakages and quality of performance. No raw materials or fuels will be stored within, or in the vicinity of, the European sites.
- All site personnel will be trained and aware of the appropriate action in the event of an emergency, such as the spillage of potentially polluting substances. Spill kits are retained to ensure that all spillages or leakages are dealt with immediately and staff are trained in their proper use. Any servicing of vehicles will be confined to designated and suitably protected areas, and there will be no servicing or refuelling of vehicles within, or in the vicinity of, the European sites. Any pollution incident or spill will be reported to the site supervisor and appropriate action taken.

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<sup>59</sup> CIRIA Document 650

- Temporary access tracks will comprise rubber matting or aluminium road panels at locations in the vicinity of European sites or rivers draining into these sites detailed. Tracks will be up to 4m wide and routed away from drains in those locations. In addition, silt barriers will be used at those sensitive locations to prevent direct runoff to local watercourses. All temporary access tracks will be removed at the end of the construction phase and the land will be restored to its original condition.
  - Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at an appropriate facility offsite or at the location where concrete was sourced.
  - Water quality monitoring will be undertaken prior to the commencement of construction to confirm baseline data as set out in the EIS and NIS and ensure that, during the construction phase of the proposed development, there is no deterioration in water quality. In particular, such confirmatory monitoring will be targeted at watercourses considered to have a higher potential for pollution (e.g. towers where there are watercourses within 20m of the construction works). At these locations, water quality monitoring will include daily inspection of adjacent watercourses. Regular sampling for pH and conductivity will be undertaken in order to ensure the implementation and effectiveness of the recommended mitigation measures with sampling for suspended solids and hydrocarbons if any change in the appearance is identified. Daily observations of watercourses close to construction works will be logged and details of observations including photographs will be recorded. In the unlikely event that any pollution event is suspected to have occurred, samples will be collected upstream and downstream of this point, and sent to an appropriately accredited laboratory for analysis. All works will halt until the source has been identified, controlled and any remediation undertaken.

### **6.2.3 Appraisal of Effectiveness of Construction Stage Mitigation**

- 14 Following effective implementation of the above mitigation measures, it is the opinion of the authors of this NIS that the construction phase of proposed development will not adversely affect the integrity of any relevant European site on the basis of complete, precise and definitive findings and that no scientific doubt remains as to the absence of the identified potential effects in circumstances where the mitigation measures identified in this NIS will be implemented.

### 6.3 OPERATIONAL PHASE MITIGATION

- 15 Standard water pollution protection measures, such as those identified in the context of the construction phase will be implemented during operation of the overhead line (OHL), i.e. during times of maintenance where any works are undertaken in the vicinity of the River Boyne and River Blackwater cSAC and SPA.
- 16 In circumstances where those mitigation measures will be effectively implemented, the operational phase of the proposed development will not have adverse effects on the integrity of the European sites considered, i.e. the River Boyne and River Blackwater cSAC and SPA.
- 17 The key operational impacts identified are associated with the potential collision risk to Whooper Swans at locations identified in **Section 5**.
- 18 Mitigation by avoidance of feeding and roosting sites has been implemented as far as possible in the selection of the alignment. However, given the geographic spread of Whooper Swans in this area and other significant non-ornithological constraints, it will not be possible to avoid crossing regular Whooper Swan flightlines between roost and feeding sites altogether. In this regard there is potential for collisions in particular with the earth wire component of the alignment.
- 19 Mitigation measures to reduce impacts at specific sites are required in the form of earth wire marking with bird flight diverters. The various types of birdflight diverters suitable for power lines, their effectiveness and configuration are discussed in detail in APLIC (2012)<sup>60</sup> and this informed the proposed mitigation choice. Based on the best available information and research based studies reviewed, the installation of flight diverters will reduce the potential collision risks associated with the new alignment. Studies where the installation of bird flight diverters resulted in a reduction in swan collisions with transmission lines include Frost (2008)<sup>61</sup> and Slater (2006)<sup>62</sup>. Barrientos *et al.* (2011)<sup>63</sup> in a review of 21 line marking studies concluded that line marking reduced bird mortalities by 55-94% where an observed effect was noted pre-line marking. Janss & Ferrer (1998)<sup>64</sup> recorded a reduction in actual versus predicted mortality for bird species studied of 81%. Rasmussen (2001) cited in Hunting (2002)<sup>65</sup> found that the

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<sup>60</sup> Avian Power Line Interaction Committee - APLIC (2012). *Reducing Avian Collisions with Power lines: The State of the Art in 2012*. Edison Electric Institute. Washington, D.C.

<sup>61</sup> Frost D (2008). *The use of 'flight diverters' reduces mute swan *Cygnus olor* collision with powerlines at Abberton Reservoir, Essex, England* Conservation Evidence (2008) 5, 83-91.

<sup>62</sup> Slater, G.L. (2006). *Trumpeter Swan (*Cygnus buccinator*): a technical conservation assessment*. USDA Forest Service, Rocky Mountain Region. Retrieved from: <http://www.fs.fed.us/r2/projects/scp/assessments/trumpeterswan.pdf>.

<sup>63</sup> Barrientos, R., Alonso, J.C., Ponce C. & Palacín, C. (2011). *Meta-analysis of the effectiveness of marked wire in reducing avian collisions with power lines*. Conservation Biology.

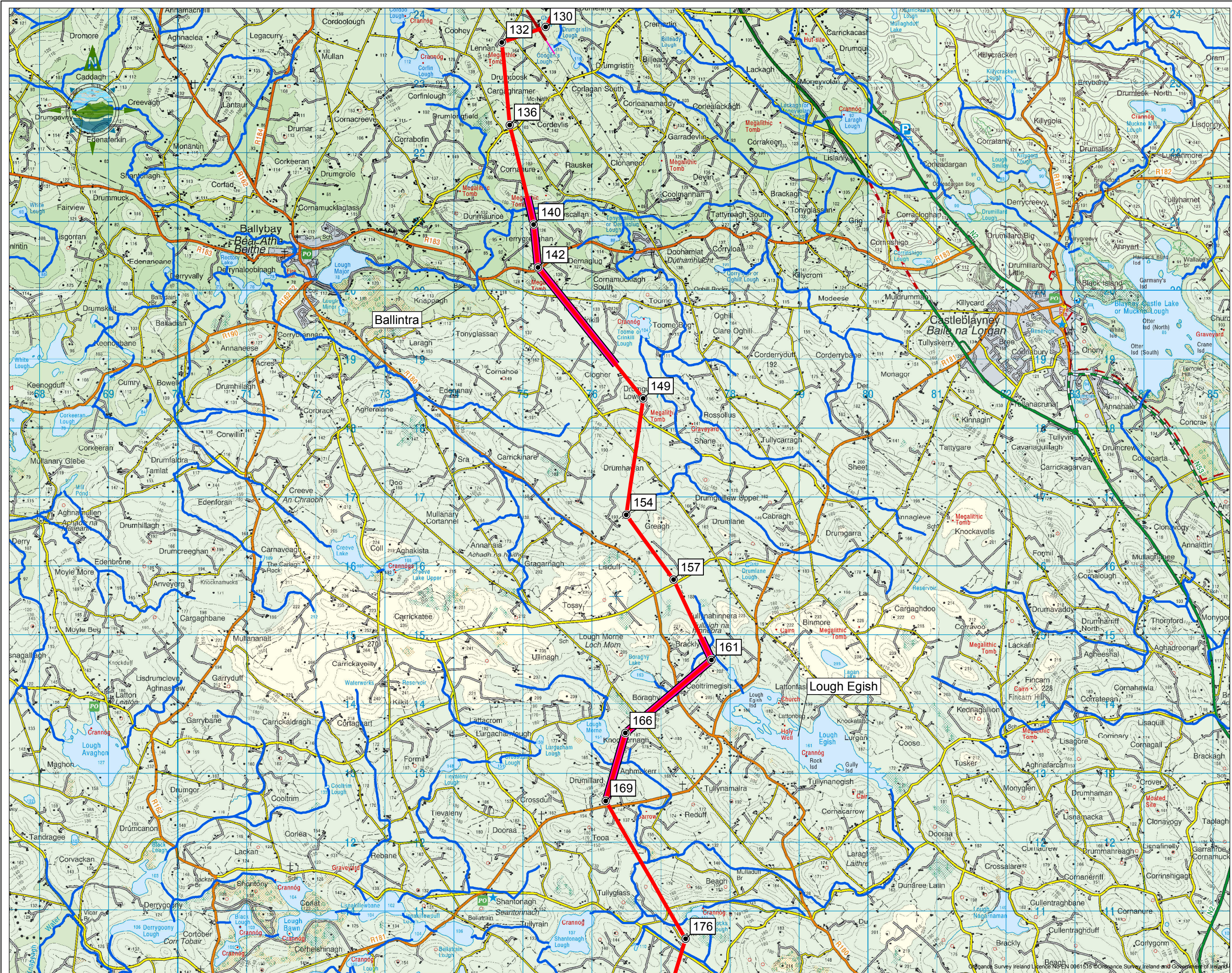
<sup>64</sup> Janss, G.F.E., and Ferrer, M. 1998: Rate of bird collision with power lines: effects of conductor-marking and static wire-marking. *Journal of Field Ornithology* 69(1):8-17.

<sup>65</sup> Hunting, K. 2002: A roadmap for PIER research on avian collisions with power lines in California. Commission Staff Report P500-02071F submitted to the California Energy Commission, Sacramento, California, USA

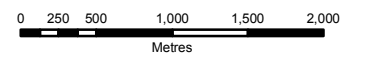
installation of flight diverters eliminated collisions completely. Additional studies cited in APLIC (2012) (Roig-Soles & Navazo-Lopez, 1997; Crowder, 2000) also concluded flight diverters were effective at reducing collisions. In this regard, precautionary line marking is considered the best practice approach to minimise the collision risk of the proposed OHL.

- 20 A clearly defined monitoring programme will be implemented for Whooper Swans to assess the effectiveness of line marking. All locations where flightlines were identified will be surveyed during the pre-construction stage, construction and operation stages (up to 5 years). Confirmatory surveys will be conducted at all sites identified, monthly between October and April when Whooper Swans are present in the area. Throughout the lifetime of the proposed monitoring works, additional areas where flightlines or collisions are recorded will be added to the list of areas to be surveyed. Landowners with towers on their land will be engaged with and encouraged to get in touch with the bird surveyor regarding observed Whooper Swan or other bird species collisions. The results of winter monitoring studies and engagement with landowners will inform further actions to minimise risks as highly transient species (in terms of distribution and flightlines) like Whooper Swans require ongoing consideration after the planning stage. Yearly monitoring reports for the construction and operational phases will detail required actions and will be drafted in consultation with NPWS or other relevant experts as appropriate.
- 21 The type of flight diverters recommended for installation are swan flight diverter markers constructed from high impact grey PVC (UV stabilised) fitted approximately 5m apart along each earth wire. This line marking is proposed for the earth wires to increase visibility of the earth wires to flying birds. While Whooper Swans are the primary focus of the line marking, the installation of swan flight diverters will increase visibility of the earth wire component for all flying birds, thereby reducing the collision risk for all species. In addition at one location between towers 355 and 357 aviation marker spheres will be installed which serve a dual purpose of acting as a bird flight diverter at this location.
- 22 Areas identified as requiring line marking are defined as; “*Locations in which the alignment bisects observed relatively regular flight paths by Whooper Swan between feeding and roosting areas*”, larger river crossings (including the River Boyne) or nationally important concentrations in close proximity (<1km) i.e. the Yellow River area.
- 23 Areas and lengths of alignment proposed for marking with flight diverters are highlighted in **Figures 6.1-6.4**, and described as follows:
- Between Towers 139 and 147 where the alignment passes to the east of Ballintra it is recommended that approximately 2.8km of the earth wires are marked with swan flight diverters;

- Between Towers 160 and 169 where the alignment passes to the west of Lough Egish it is recommended that approximately 3.0km of the earth wires are marked with swan flight diverters;
- Between Towers 196 and 203 in the vicinity of Comertagh and Raferagh Loughs, it is recommended that approximately 2.5km of the earth wires are marked with swan flight diverters;
- Between Towers 257 to 268 near Cruicetown / Whitewood Lough; it is recommended that approximately 3.3km of the earth wires are marked with swan flight diverters;
- Between Towers 279 and 283 west of Clooney Lough; it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters;
- West of the Yellow River foraging area between Towers 291 and 295. The main identified flightline does not cross the alignment. However there is potential that Whooper Swan could move towards the area of the alignment. Given that high numbers occur in this area it is recommended that approximately 1.5km of the earth wires are marked with swan flight diverters;
- Between Towers 307 and 312 at the River Blackwater crossing point it is recommended that approximately 1.6km of the earth wires are marked with swan flight diverters; and
- In addition, between Towers 355 and 357 (including the River Boyne Crossing), 60cm diameter marker spheres will be added to the earth wire to increase visibility.



- Legend**
- Proposed Angle Tower Location
  - Proposed Line Route
  - Earth Wire Marking
  - Proposed Alterations to Existing Electricity Line



Issue	Date	Description	By	Chkd.
B	APR-15	Issued	G.F.	O.McA.
A	JAN-14	Issued	G.F.	E.C.



Project:

**NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT**

Title:

**EARTH WIRE LINE MARKING - BALLINTRA AND LOUGH EGISH**

Scale @ A3: 1:50,000

Prepared by: G.Fil  
Checked: O.McAlister  
Date: April 2015

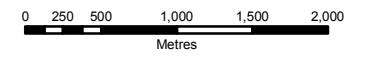
Project Director: Damien Grehan

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- Legend**
- Proposed Angle Tower Location
  - Proposed Line Route
  - Earth Wire Marking
  - Proposed Alterations to Existing Electricity Line



Issue	Date	Description	By	Chkd.
B	APR-15	Issued	G.F.	O.McA.
A	JAN-14	Issued	G.F.	E.C.

Client:



Project:

**NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT**

Title:

**EARTH WIRE LINE MARKING - COMERTAGH AND RAFERAGH LOUGHS**

Scale @ A3: 1:50,000

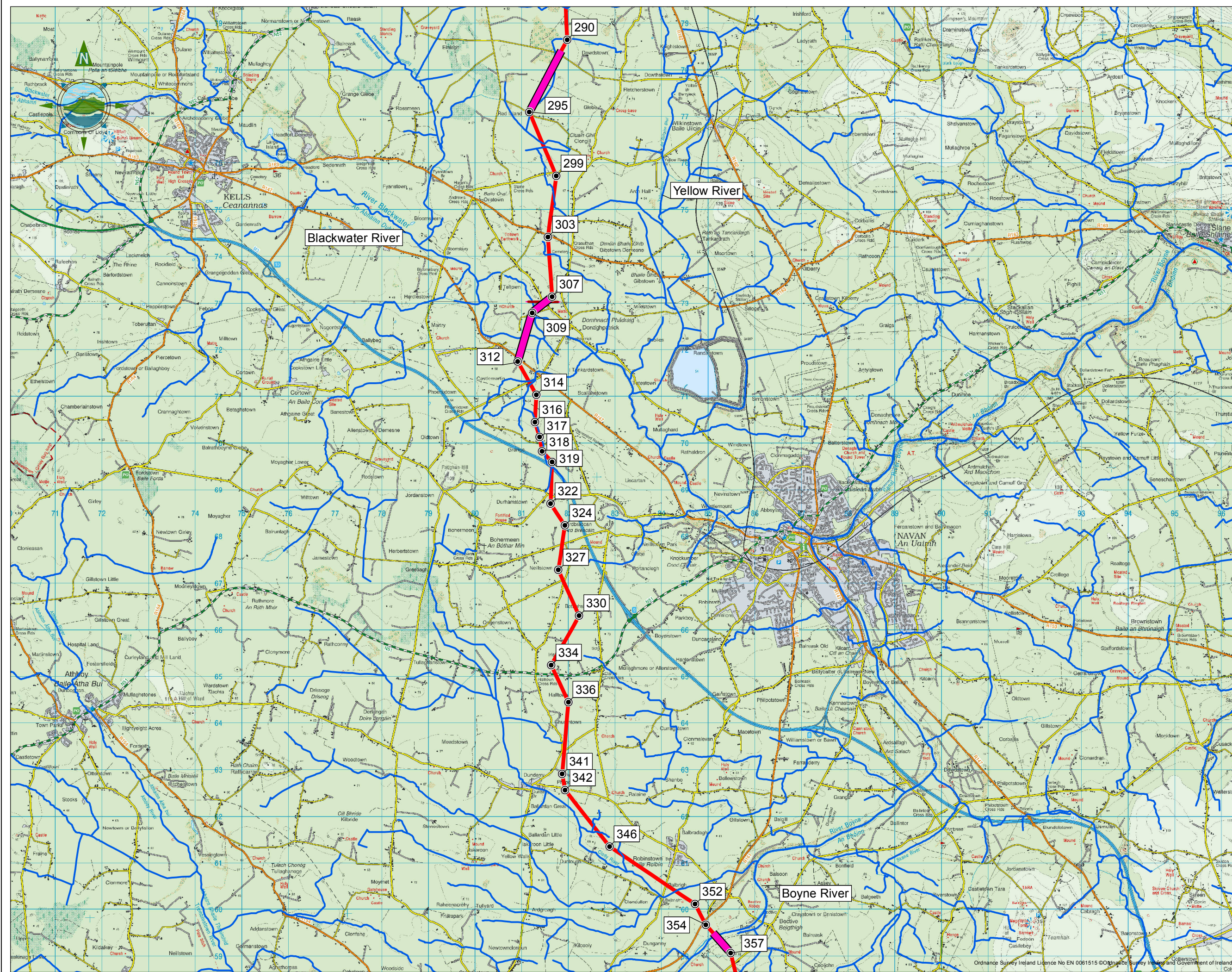
Prepared by: G.Fil  
Checked: O.McAlister  
Date: April 2015

Project Director: Damien Grehan



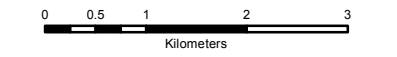
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**Legend**

- Proposed Angle Tower Location
- Proposed Line Route
- Earth Wire Marking
- Proposed Alterations to Existing Electricity Line



Issue	Date	Description	By	Chkd.
C	APR-15	Issued	G.F.	O.McA.
B	DEC-14	Issued	G.F.	O.McA.
A	JAN-14	Issued	G.F.	E.C.

Client:

Project:

**NORTH-SOUTH 400 kV INTERCONNECTION DEVELOPMENT**

Title:

**EARTH WIRE LINE MARKING - BLACKWATER,BOYNE AND YELLOW RIVER**

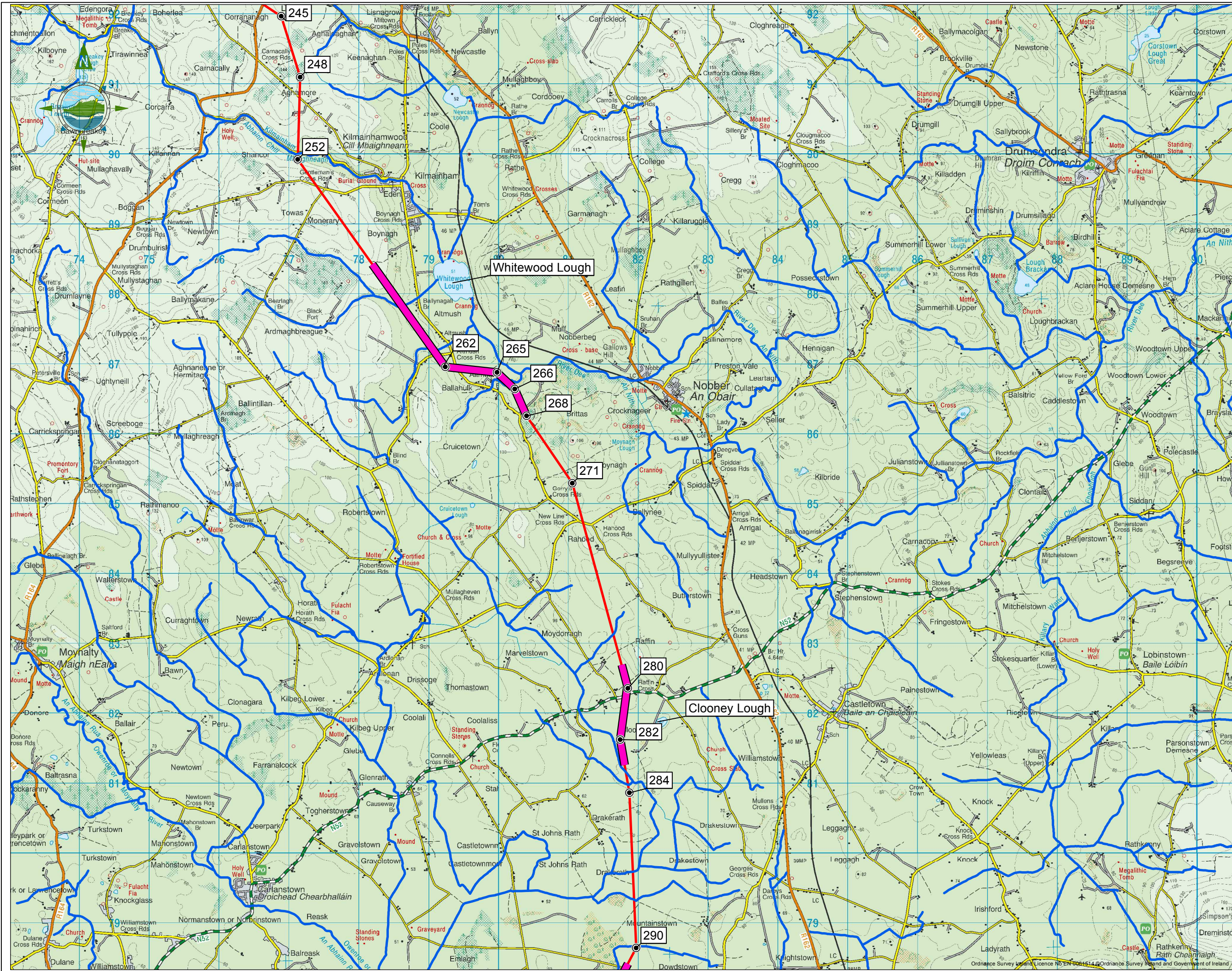
Scale @ A3: 1:75,000

Prepared by: G.Fil  
Checked: O.McAlister  
Date: April 2015

Project Director: Damien Grehan

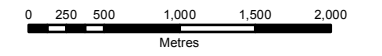
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tel: +353 (0)1-8030406  
fax: +353 (0)1-8030409  
e-mail: info@tobin.ie  
www.tobin.ie





**Legend**

- Proposed Angle Tower Location
- Proposed Line Route
- Earth Wire Marking



Issue	Date	Description	By	Chkd.
B	DEC 2014	Issued	G.F.	O.McA
A	JAN 2014	Issued to Client	G.F.	E.C.

Client:

Project:

NORTH-SOUTH 400 kV  
INTERCONNECTION DEVELOPMENT

Title:

EARTH WIRE LINE  
MARKING - CLOONEY  
AND WHITEWOOD LOUGH

Scale @ A3: 1:50,000

Prepared by: G.Fil  
Checked: O.McAlister  
Date: December 2014

Project Director: Damien Grehan

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## 7 CONCLUSION

- 1 This NIS has been submitted on behalf of the developer of the proposed development to enable the Board as competent authority to conduct a both a Stage 1 Screening Assessment in relation to the European sites outlined above and, as appropriate a Stage 2 Appropriate Assessment (AA) in relation to the River Boyne and River Blackwater cSAC and SPA and remote SPA sites for which Whooper Swan is a qualifying feature, including Upper Lough Erne SPA, Lough Oughter and Associated Loughs SPA, Lough Neagh and Lough Beg SPA, Lough Swilly SPA and Lough Foyle SPA.
- 2 As established by recent case law, in order for such an AA, to be lawfully conducted, the competent authority (in this case An Bord Pleanála (the Board)):
  - (i) must identify, in the light of the best scientific knowledge in the field, all aspects of the proposed development which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;
  - (ii) must contain complete, precise and definitive findings and conclusions and may not have *lacunae* or gaps; and
  - (iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the Board decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects.
- 3 This Natura Impact Statement assesses the likely significance of all potential impacts arising from the proposed development on the integrity of the relevant European sites. It has been prepared taking into account the precautionary principle and is based on the best scientific knowledge in the field.
- 4 The potential for significant effects to arise to the River Boyne and Blackwater cSAC is restricted to the construction phase of the project. Disturbance to protected species for which the site is designated (otter) and localised impacts to water quality which may affect protected aquatic species and their habits are the potential effects identified as relevant to this European site. Detailed mitigation has been developed to prevent and or ameliorate these impacts so that no element of the project, alone or in-combination with other projects or plans will adversely affect the integrity of the River Boyne and Blackwater cSAC in view of its conservation objectives.
- 5 The potential for significant effects to arise to the River Boyne and Blackwater SPA is restricted to the construction phase of the project. Disturbance to protected species for which the site is designated (Kingfisher) and localised perturbations of water quality which may affect protected

aquatic species and their habits are the potential effects to this European site. Detailed mitigation has been developed to prevent and or ameliorate these impacts so that no element of the project, alone or in-combination with other projects or plans will adversely affect the integrity of the River Boyne and Blackwater SPA in view of its conservation objectives.

6 The potential for significant effects to arise to the qualifying interest species of Whooper Swan from Upper Lough Erne SPA, Lough Oughter and Associated Loughs SPA, Lough Neagh and Lough Beg SPA, Lough Swilly SPA and Lough Foyle SPA is restricted to the operational phase of the project. Given the very low numbers of migratory flights of “SPA birds” expected to cross the alignment, any effects arising from collisions on the population of whooper swan associated with any of these SPA’s are likely to be negligible, and even in the event of such collisions, given the very low numbers of migratory flights, any mortality arising from any such collisions, the proposed development will not adversely affect the integrity of any of the relevant European Sites in view of their conservation objectives in respect of the Whooper Swan or any conservation objectives in respect of those European Sites.

7 Accordingly, for the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the proposed development which, by itself, or in combination with other plans or projects, which may affect the relevant European Sites have been considered. The NIS contains information which the Board, as competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which the Board is capable of determining that all reasonable scientific doubt has been removed as to the effects of the proposed development on the integrity of the relevant Natura 2000 sites. In conclusion, in the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the Board is enabled to ascertain that the proposed development will not adversely affect the integrity of any of the European sites concerned.

**APPENDIX A**  
**[SITE SYNOPSES]**



**Site Name: River Boyne and River Blackwater SAC**

**Site Code: 002299**

This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath, and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part, with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site, including Slane, Navan, Kells, Trim, Athboy and Ballivor.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

[7230] Alkaline Fens
[91E0] Alluvial Forests*
[1099] River Lamprey ( <i>Lampetra fluviatilis</i> )
[1106] Atlantic Salmon ( <i>Salmo salar</i> )
[1355] Otter ( <i>Lutra lutra</i> )

The main areas of alkaline fen in this site are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough. The hummocky nature of the local terrain produces frequent springs and seepages which are rich in lime. A series of base-rich marshes have developed in the poorly-drained hollows, generally linked with these three lakes. Open water is usually fringed by Bulrush (*Typha latifolia*), Common Club-rush (*Scirpus lacustris*) or Common Reed (*Phragmites australis*), and this last species also extends shorewards where a dense stand of Great Fen-sedge (*Cladium mariscus*) frequently occurs. This in turn grades into a sedge and grass community (*Carex* spp. and Purple Moor-grass, *Molinia caerulea*), or one dominated by Black Bog-rush (*Schoenus nigricans*). An alternative aquatic/terrestrial transition is a floating layer of vegetation. This is normally based on Bogbean (*Menyanthes trifoliata*) and Marsh Cinquefoil (*Potentilla palustris*). Other species gradually become established on this cover, especially plants tolerant of low nutrient status e.g. bog mosses (*Sphagnum* spp.). Diversity of plant and animal life is high in the fen and the flora includes many rarities. Plants of interest include Narrow-leaved Marsh-orchid (*Dactylorhiza traunsteineri*), Fen Bedstraw (*Galium uliginosum*), Cowbane (*Cicuta virosa*), Frogbit (*Hydrocharis morsus-ranae*) and Least Bur-reed (*Sparganium minimum*). These species tend to be restricted in their distribution in Ireland. Also notable is the

abundance of aquatic stoneworts (*Chara* spp.) which are characteristic of calcareous wetlands.

The rare plant Round-leaved Wintergreen (*Pyrola rotundifolia*) occurs around Newtown Lough. This species is listed in the Red Data Book and this site represents its only occurrence in Co. Meath.

Wet woodland fringes many stretches of the Boyne. The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. The islands were formed by the build-up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, willow (*Salix* spp.) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*Salix purpurea*) and Rusty Willow (*S. cinerea* subsp. *oleifolia*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Rusty Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*) are common in the latter, and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Wild Angelica (*Angelica sylvestris*), Yellow Iris (*Iris pseudacorus*), horsetails (*Equisetum* spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*).

The dominant habitat along the edges of the river is freshwater marsh, and the following plant species occur commonly in these areas: Yellow Iris, Creeping Bent (*Agrostis stolonifera*), Canary Reed-grass (*Phalaris arundinacea*), Marsh Bedstraw (*Galium palustre*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*). In the wetter areas Common Meadow-rue (*Thalictrum flavum*) is found. In the vicinity of Dowth, Fen Bedstraw (*Galium uliginosum*), a scarce species mainly confined to marshy areas in the midlands, is common in this vegetation. Swamp Meadow-grass (*Poa palustris*) is an introduced plant which has spread into the wild (naturalised) along the Boyne approximately 5 km south-west of Slane. It is a rare species which is listed in the Red Data Book and has been recorded among freshwater marsh vegetation on the banks of the Boyne in this site. The only other record for this species in the Republic of Ireland is from a site in Co. Monaghan.

The secondary habitat associated with the marsh is wet grassland and species such as Tall Fescue (*Festuca arundinacea*), Silverweed (*Potentilla anserina*), Creeping Buttercup (*Ranunculus repens*), Meadowsweet and Meadow Vetchling (*Lathyrus pratensis*) are well represented. Strawberry Clover (*Trifolium fragiferum*), a plant generally restricted to coastal locations in Ireland, has been recorded from wet grassland vegetation at Trim. At Rosnaree river bank on the River Boyne, Round-Fruited Rush (*Juncus compressus*) is found in alluvial pasture, which is generally periodically flooded during the winter months. This rare plant is only found in three counties in Ireland.

Along much of the Boyne and along tributary stretches are found areas of mature deciduous woodland on the steeper slopes above the floodplain marsh or wet woodland vegetation. Many of these are planted in origin. However the steeper areas of King Williams Glen and Townley Hall wood have been left unmanaged and now have a more natural character. East of Curley Hole the woodland has a natural appearance with few conifers. Broadleaved species include oaks (*Quercus* spp.), Ash, willows, Hazel (*Corylus avellana*), Sycamore (*Acer pseudoplatanus*), Holly (*Ilex aquifolium*), Horse-chestnut (*Aesculus hippocastanum*) and the shrubs Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Elder (*Sambucus nigra*). South-west of Slane and in Dowth, some more exotic tree species such as Beech (*Fagus sylvatica*), and occasionally Lime (*Tilia cordata*), are seen. The coniferous trees Larch (*Larix* sp.) and Scots Pine (*Pinus sylvestris*) also occur. The woodland ground flora includes Barren Strawberry (*Potentilla sterilis*), Enchanter's-nightshade (*Circaea lutetiana*) and Ground-ivy (*Glechoma hederacea*), along with a range of ferns. Variation occurs in the composition of the canopy - for example, in wet patches alongside the river, White Willow and Alder form the canopy.

Other habitats present along the Boyne and Blackwater include lowland dry grassland, improved grassland, reedswamp, weedy waste ground, scrub, hedge, drainage ditch and canal. In the vicinity of Lough Shesk, the dry slopes of the morainic hummocks support grassland vegetation which, in some places, is partially colonised by Gorse (*Ulex europaeus*) scrub. Those grasslands which remain unimproved for pasture are species-rich, with Common Knapweed (*Centaurea nigra*), Creeping Thistle (*Cirsium arvense*) and Ribwort Plantain (*Plantago lanceolata*) commonly present. Fringing the canal alongside the Boyne south-west of Slane are areas with Reed Sweet-grass (*Glyceria maxima*), Great Willowherb (*Epilobium hirsutum*) and Meadowsweet.

The Boyne and its tributaries form one of Ireland's premier game fisheries and the area offers a wide range of angling, from fishing for spring salmon and grilse to seatrout fishing and extensive brown trout fishing. Atlantic Salmon (*Salmo salar*) use the tributaries and headwaters as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the Habitats Directive. Atlantic Salmon run the Boyne almost every month of the year. The Boyne is most important as it represents an eastern river which holds large three-sea-winter fish from 20-30 lb. These fish generally arrive in February, with smaller spring fish (10 lb) arriving in April/May. The grilse come in July, water permitting. The river gets a further run of fish in late August and this run would appear to last well after the fishing season. The salmon fishing season lasts from 1<sup>st</sup> March to 30<sup>th</sup> September.

The Blackwater is a medium sized limestone river which is still recovering from the effects of the arterial drainage scheme of the 1970s. Salmon stocks have not recovered to the numbers that existed pre-drainage. The Deel, Riverstown, Stoneyford and Tremblestown Rivers are all spring-fed, with a continuous high volume of water. They are difficult to fish because some areas are overgrown, while others have been affected by drainage with resultant high banks.

This site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive which it supports, namely River Lamprey (*Lampetra fluviatilis*), which is present in the lower reaches of the Boyne River, and Otter (*Lutra lutra*), which can be found throughout the site. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. Common Frog, another Red Data Book species, also occurs within the site. All of these animals, with the addition of the Stoat and Red Squirrel, which also occur within the site, are protected under the Wildlife Act, 1976.

Whooper Swans winter regularly at several locations along the Boyne and Blackwater Rivers. Known sites are at Newgrange (approx. 20 in recent winters), near Slane (20+ in recent winters), Wilkinstown (several records of 100+) and River Blackwater from Kells to Navan (104 at Kells in winter 1996/97, 182 at Headfort in winter 1997/98, 200-300 in winter 1999/00). The available information indicates that there is a regular wintering population of Whooper Swans based along the Boyne and Blackwater River valleys. The birds use a range of feeding sites but roosting sites are not well known. The population is substantial, certainly of national, and at times international, importance. Numbers are probably in the low hundreds.

Intensive agriculture is the main land use along the site. Much of the grassland is in very large fields and is improved. Silage harvesting is carried out. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the lakes. In the more extensive agricultural areas sheep grazing is carried out.

Fishing is a main tourist attraction on the Boyne and Blackwater and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The Eastern Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Parts of the river system have been arterially dredged. In 1969 an arterial dredging scheme commenced and disrupted angling for 18 years. The dredging altered the character of the river completely and resulted in many areas in very high banks. The main channel from Drogheda upstream to Navan was left untouched, as were a few stretches on the Blackwater. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area. Drainage of the adjacent river systems also impacts on the many small wetland areas throughout the site. The River Boyne is a designated Salmonid Water under the E.U. Freshwater Fish Directive.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as examples of other important habitat types. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east. The semi-natural habitats, particularly the strips of woodland which extend along the river banks, and the marsh and wet

grasslands, increase the overall habitat diversity and add to the ecological value of the site, as does the presence of a range of Red Data Book plant and animal species and the presence of nationally rare plant species.

## **SITE SYNOPSIS**

**SITE NAME: RIVER BOYNE AND RIVER BLACKWATER SPA**

**SITE CODE: 004232**

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation.

Most of the site is underlain by Carboniferous limestone but Silurian quartzite also occurs in the vicinity of Kells and Carboniferous shales and sandstones close to Trim.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher.

A survey in 2010 recorded 19 pairs of Kingfisher (based on 15 probable and 4 possible territories) in the River Boyne and River Blackwater SPA. A survey conducted in 2008 recorded 20-22 Kingfisher territories within the SPA. Other species which occur within the site include Mute Swan (90), Teal (166), Mallard (219), Cormorant (36), Grey Heron (44), Moorhen (84), Snipe (32) and Sand Martin (553) – all figures are peak counts recorded during the 2010 survey.

The River Boyne and River Blackwater Special Protection Area is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

25.11.2010

## **SITE SYNOPSIS**

**SITE NAME: LOUGH OUGHTER COMPLEX SPA**

**SITE CODE: 004049**

Lough Oughter and its associated loughs occupy much of the lowland drumlin belt in north and central Co. Cavan between Belturbet, Killashandra and Cavan town. This area comprises a maze of waterways, islands, small lakes and peninsulas. Lough Oughter, the largest lake in the site, is relatively shallow (maximum depth of 10 m) and considered to be a naturally eutrophic system. Its main inflowing rivers are the River Erne and the Annalee River, whilst the main outflow is the River Erne, which connects the lake to Upper Lough Erne and Lower Lough Erne to the north.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Whooper Swan, and Wigeon. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The Lough Oughter Complex is of importance for a range of wintering waterfowl. Of particular note is an internationally important population of Whooper Swan (318) that is based in the area and which uses the lakes as a roost - all figures are five year mean peaks for the period 1995/96 to 1999/2000. A population of Greenland White-fronted Goose (75) of regional importance also roosts on the lakes and feeds mainly on agriculturally improved grassland nearby. The site supports nationally important wintering populations of two species, Great Crested Grebe (89) and Wigeon (903). Other species which occur regularly include Mute Swan (139), Teal (220), Mallard (336), Pochard (58), Tufted Duck (105), Goldeneye (117), Lapwing (381), Curlew (33), Little Grebe (8), Cormorant (81) and Black-headed Gull (311). A small colony of Common Tern occurs (10 pairs recorded at Farnham Lough in 1995).

Lough Oughter is at the centre of the Irish breeding range of Great Crested Grebe and the site supports in excess of 10% of the estimated national breeding total of this species (115 individuals in 1986-88).

The Lough Oughter Complex SPA is of ornithological importance for its wintering waterbird populations. Of particular note is the internationally important population of Whooper Swan that is based in the area. The site also supports nationally important populations of a further two wintering species and, notably, holds the highest breeding concentrations of Great Crested Grebe in the country. Two of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan and Greenland White-fronted Goose.

29.9.2010

# Upper Lough Erne Special Protection Area UK9020071

*Last updated: 24 March 2010*

**Area: 5,787 hectares**

**Grid Reference: H 330280**

**Date Classified: 04/03/97**

Upper Lough Erne Lough is situated in County Fermanagh in the west of Northern Ireland is a very large and complex freshwater system.

A series of flooded drumlins in the course of the River Erne give rise to a complex of islands, bays and many lakes bordered by damp pastures, fens, reedswamp and alder/willow carr and oak woodland.

The Special Protection Area site boundary is entirely coincident with the composite boundary of the following ASSIs:

Corraslough Point, Dernish Island, Finn Floods, Inishroosk, Killymackan Lough, Upper Lough Erne - Belleisle, Upper Lough Erne - Crom, Upper Lough Erne - Galloon and Upper Lough Erne - Trannish

The site qualifies under Article 4.1 of EC Directive 79/409 on the Conservation of Wild Birds by regularly supporting internationally important numbers of wintering whooper swans.

Upper Lough Erne provides a core protected area for whooper swans in the region of Northern Ireland, as there is interchange between the swans using protected areas and those ranging more widely on surrounding farmland.

Upper Lough Erne contributes to the maintenance of the geographic range of the Annex 1 Greenland white-fronted goose population of Northern Ireland through supporting regionally important numbers.

It also supports an important assemblage of breeding birds including common tern and in the past supported breeding corncrake. Both are Annex 1 species.

Other migratory birds breeding on the site include great crested grebe and important concentrations of three species of waders which are declining elsewhere, curlew, snipe and redshank.

Nationally important wintering wildfowl species, many of which are migratory, include great crested grebe, cormorant, mute swan, tufted duck, wigeon, teal, goldeneye, coot, mallard, snipe, curlew, and redshank.

EC DIRECTIVE 79/409 ON THE CONSERVATION OF WILD BIRDS:

LOUGH NEAGH AND LOUGH BEG SPECIAL PROTECTION AREA

Situated in the centre of Northern Ireland, Lough Neagh is the largest lake in the British Isles. The proposed Special Protection Area includes three eutrophic water bodies, Lough Neagh and two related loughs Lough Beg and Portmore Lough together with surrounding swamp, fen, wet grassland and swampy woodland. The area of the site is 41,188 hectares.

The boundary of the proposed Special Protection Area follows the boundaries of the Lough Neagh ASSI, Lough Beg ASSI and Portmore Lough ASSI. The site also forms part of a site listed as a wetland of international importance under the Ramsar Convention.

The site qualifies under Article 4.1 of EC Directive 79/409 by regularly supporting internationally important numbers of wintering Bewick's swan *Cygnus columbianus* (the five year peak mean for the period 1989/90 to 1993/94 was 251 which comprises 1.5% of the Western and Central Europe population and 10% of the Irish population) and whooper swan *Cygnus cygnus* (the five year peak mean for the period 1989/90 to 1993/94 was 923 which comprises 5.4% of the total Icelandic breeding population and 6.5% of the Irish population). The site also qualifies under Article 4.1 by regularly supporting nationally important numbers of breeding common tern *Sterna hirundo* (200 pairs in 1995 which comprise 7.4% of Irish population).

The site qualifies under Article 4.2 of the Directive as a wetland of international importance by regularly supporting over 20,000 waterfowl in winter. The five year peak mean for the period 1989/90 to 1993/94 was 79,915 birds including nationally and internationally important numbers of the following species: 32,165 pochard *Aythya ferina* (9.2% of north-west European population, 80.4% of Irish population), 23,476 tufted duck *Aythya fuligula* (3.1% of north-west European population, 58.7% of Irish population) and 12,479 goldeneye *Bucephala clangula* (4.2% of north-west European population, almost 100% of Irish population), 390 little grebe *Tachybaptus ruficollis* (26% of Irish population), 741 great crested grebe *Podiceps cristatus* (24.7% of Irish population), 781 cormorant *Phalacrocorax carbo* (3.9% of Irish population), 1,375 mute swan *Cygnus olor* (22.9% of Irish population), 129 greylag goose *Anser anser* (3.4% of Irish population), 165 shelduck *Tadorna tadorna* (2.3% of Irish population), 3,447 wigeon *Anas penelope* (2.8% of Irish population), 114 gadwall *Anas strepera* (19% of Irish population), 1,868 teal *Anas crecca* (2.9% of Irish population), 4,982 mallard *Anas platyrhynchos* (10% of Irish population), 173 shoveler *Anas clypeata* (2.7% of Irish population), 2,557 scaup *Aythya marila* (85.2% of Irish population) and 6,676 coot *Fulica atra* (26.7% of Irish population).

Lough Neagh is also notable for supporting an important assemblage of breeding birds including the following species which occur in nationally important numbers: great crested grebe, gadwall, pochard, tufted duck, snipe *Gallinago gallinago*, redshank *Tringa totanus*, common gull *Larus canus*, lesser black-backed gull *Larus fuscus* and black-headed gull *Larus ridibundus*. Other important breeding wetland species include shelduck, teal, shoveler, lapwing and curlew.

The Register of European Sites in Northern Ireland  
Register reference number UK9020091  
Date of registration 17 February 1998

T056/GL1

Signed Bertie Cullin  
on behalf of the Department of the Environment  
for Northern Ireland

## SITE SYNOPSIS

**SITE NAME: LOUGH SWILLY SPA**

**SITE CODE: 004075**

This site, situated in the northern part of Co. Donegal, comprises the inner part of Lough Swilly, a long inlet of the sea that cuts through a variety of metamorphic rocks on the west side of the Inishowen Peninsula. The Lough Swilly SPA extends from just below Letterkenny north to Rathmullan and, except in the area between Farsetmore and Blanket Nook on the southern side of Lough Swilly, the site is bounded by the High Water Mark; its seaward boundary is the Low Water Mark. Between Farsetmore and Blanket Nook a series of improved pasture and arable fields of importance to geese and swans are included. The site includes sections of the estuaries of the River Swilly, the River Leannan and the Isle Burn and the predominant habitat is a series of extensive sand and mud flats which are exposed at low tide – both estuaries and sand/mud flats are listed on Annex I of the E.U. Habitats Directive. Other habitats represented on the site are salt marshes, lakes which are lagoonal in character (at Blanket Nook), rivers and streams, sand and shingle beaches, lowland wet, dry and improved grasslands, arable land, drainage ditches, reedbeds and scrub. The adjacent Inch Lough and Levels are included in a separate SPA.

Lough Swilly is an important site for waterfowl in autumn and winter. The shallow waters provide suitable habitat for grebes and diving duck, while the intertidal flats are used by an excellent diversity of wildfowl and waders. At high tide, the duck and wader species roost on the salt marshes and shorelines, with some species moving to the adjacent pasture and arable fields. In the three winters 1994/95 to 1996/97, 16 species occurred in nationally important numbers as follows (figures are average maximum counts for the 3 winters): Great Crested Grebe (274), Shelduck (646), Wigeon (1,673), Teal (1,381), Mallard (1,155), Shoveler (58), Scaup (143), Goldeneye (169), Red-breasted Merganser (103), Coot (335), Oystercatcher (1,459), Knot (327), Dunlin (7,995), Curlew (1,716), Redshank (1,080) and Greenshank (30). Other species which occur in regionally or locally important numbers, and at times may exceed the threshold for national importance, include Brent Goose, Pochard, Tufted Duck, Lapwing, Ringed Plover, Grey Plover, Bar-tailed Godwit (a species that is listed on Annex I of the E.U. Birds Directive) and Turnstone. The site is also an important area for the Great Northern Diver and the rare Slavonian Grebe, both Birds Directive Annex I species. Golden Plover, a species that is listed on Annex I of the E.U. Birds Directive, used the site regularly during winter (4 year mean of winter maximum 1994/95-1997/98 was 1,001 individuals).

Lough Swilly supports internationally important numbers of Greenland White-fronted Geese (5 year mean of winter maximum 1995/96-1999/00 for the Lough Swilly flock was 970 individuals), Whooper Swans (5 year mean of winter maximum 1995/96-1999/00 was 1,135 individuals, the largest population in the country) and Greylag Geese (5 year mean of winter maximum 1995/96-1999/00 was 2,020 individuals – this figure includes both migratory birds of the Icelandic population as well as an

estimated 750-1,000 feral birds). The numbers of Greylag Geese using the site has continued to increase in recent years. The main areas of the site used by these species are at Big Isle, Farsetmore, Blanket Nook and Ballylawn. The Inch Levels are used by the same flocks of geese and swans – this area is included in a separate Special Protection Area. Both Greenland White-fronted Goose and Whooper Swan are listed on Annex I of the E.U. Birds Directive.

This site is major ornithological importance for wintering waterfowl, with 16 species occurring regularly in numbers of national importance and 3 species occurring within the site in numbers of international importance. The site is regularly used by in excess of 20,000 waterfowl and thus qualifies as of international importance. The site is used by several species that are listed on Annex I of the E.U. Birds Directive.

26.2.2002

## **Lough Foyle Special Protection Area UK9020031**

*Last updated: 24 March 2010*

**Area: 2204.36 hectares**

**Grid Reference: C 621273**

**Date Classified: 02/02/99**

Lough Foyle is situated on the north coast of Northern Ireland immediately downstream and extending to the north-east of the city of Londonderry.

The site is comprised of a large shallow sea lough which includes the estuaries of the rivers Foyle, Faughan and Roe.

The site contains extensive intertidal areas of mudflats and sandflats, saltmarsh and associated brackish ditches.

The Special Protection Area includes the whole of Lough Foyle Area of Special Scientific Interest (ASSI) and the intertidal area of Magilligan ASSI in Lough Foyle extending south of Magilligan Point. The boundary of the Special Protection Area is entirely coincident with that of the Lough Foyle Ramsar site and it overlaps with Magilligan candidate Special Area of Conservation.

The site qualifies under Article 4.1 of EC Directive 79/409 on the Conservation of Wild Birds by regularly supporting, in winter, internationally important numbers of the following 3 species: whooper swan ; light-bellied brent goose and bar-tailed godwit.

The site also qualifies under Article 4.2 of the Directive by supporting over 20,000 migratory waterfowl. This total includes both the internationally important species listed above and the following waterfowl species which are nationally important in an all-Ireland context.

Red-throated diver, great crested grebe, mute swan, Bewick's swan, greylag geese, shelduck, teal, mallard, wigeon, eider, red-breasted merganser, oystercatcher, golden plover, grey plover, lapwing, knot, dunlin, curlew, redshank and greenshank.

Lough Foyle itself supports a small wintering population of Slavonian grebe.

## **SITE SYNOPSIS**

**SITE NAME: LOUGH FOYLE SPA**

**SITE CODE: 004087**

The site comprises a section of the western shore of Lough Foyle from Muff to north of Vances Point in Co. Donegal. The site is part of the larger cross-border Lough Foyle complex which regularly supports in excess of 20,000 wintering waterbirds. The majority of the wintering waterbirds that utilise this site occur along the southern and eastern shoreline of Lough Foyle in Derry, which is also designated as an SPA in Northern Ireland.

The site is selected as a Special Protection Area (SPA) under the E.U. Birds Directive, as it is part of an internationally important wetland site that regularly supports in excess of 20,000 wintering waterbirds. The assemblage of birds that utilise Lough Foyle includes internationally important populations of Whooper Swan (811), Light-bellied Brent Goose (3,765) and Bar-tailed Godwit (2,059), and nationally important populations of a further 18 species: Great Crested Grebe(148), Bewick's Swan (43), Greylag Goose (391), Shelduck (468), Wigeon (9,011), Teal (660), Mallard (1,635), Red-breasted Merganser (82), Oystercatcher (3,101), Golden Plover (4,562), Lapwing (4,024), Knot (499), Dunlin (4,991), Curlew (2,265), Redshank (988), Black-headed Gull (2,212), Common Gull (2,846) and Herring Gull (1,261) – all counts are five year mean peaks for the entire Lough Foyle complex during the period 1995/96 to 1999/2000. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Lough Foyle SPA is of high ornithological importance as it is part of an internationally important wetland site that regularly supports internationally important populations of Whooper Swan, Light-bellied Brent Goose and Bar-tailed Godwit, and nationally important populations of a further 18 species.

estimated 750-1,000 feral birds). The numbers of Greylag Geese using the site has continued to increase in recent years. The main areas of the site used by these species are at Big Isle, Farsetmore, Blanket Nook and Ballylawn. The Inch Levels are used by the same flocks of geese and swans – this area is included in a separate Special Protection Area. Both Greenland White-fronted Goose and Whooper Swan are listed on Annex I of the E.U. Birds Directive.

This site is major ornithological importance for wintering waterfowl, with 16 species occurring regularly in numbers of national importance and 3 species occurring within the site in numbers of international importance. The site is regularly used by in excess of 20,000 waterfowl and thus qualifies as of international importance. The site is used by several species that are listed on Annex I of the E.U. Birds Directive.

26.2.2002

## SITE SYNOPSIS

**SITE NAME: DUNDALK BAY SPA**

**SITE CODE: 004026**

Dundalk Bay is a large open shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16 km from Castletown River on the Cooley Peninsula, in the north, to Annagassan/Salterstown in the south. The bay encompasses the mouths and estuaries of the Rivers Dee, Glyde, Fane, Castletown and Flurry. The site contains five habitats listed under the EU Habitats Directive, i.e. perennial vegetation of stony banks, tidal mudflats, salt marshes, *Salicornia* mudflats and estuaries.

The extensive sand flats and mud flats (over 4,000 ha) have a rich fauna of bivalves, molluscs, marine worms and crustaceans which provides the food resource for most of the wintering waterfowl. The salt marshes, which occur in four main areas at Lurgangreen, Marsh South, Dundalk Harbour/Ballymascanlan Bay and Bellurgan, are used by the roosting birds at high tide. The marshes are dominated by wide expanses of Common Cord-grass (*Spartina anglica*), while Sea Purslane (*Halimione portulacoides*), Common Saltmarsh-grass (*Puccinellia maritima*) and Glasswort (*Salicornia* spp.) are other common species. The herbivorous waterfowl (notably Brent Geese and Wigeon) feed on the salt marsh grasses, as well as on areas of *Zostera* and green algae on the mudflats.

Shingle beaches are particularly well represented in Dundalk Bay, occurring more or less continuously from Salterstown to Lurgan White House in the south bay, and from Jenkinstown to east of Giles Quay in the north bay. The shingle supports such species as Spear-leaved Orache (*Atriplex prostrata*), Sea Mayweed (*Matricaria maritima*), Sea Beet (*Beta vulgaris*), Sea Rocket (*Cakile maritima*) and Sea Holly (*Eryngium maritimum*), as well as scarcer plants including Yellow Horned-poppay (*Glaucium flavum*), Sea Scutch (*Leymus arenarius*) and the Red Data Book species Sea-kale (*Crambe maritima*). At high tide, many birds roost on the shingle beaches.

The outer part of the bay provides excellent shallow-water habitat for divers, grebes, and sea duck. In summer, it is thought to be a major feeding area for auks from the Dublin breeding colonies. At night the wintering Greylag and Greenland White-fronted Geese, and Whooper Swans, from Stabannan/Braganstown (inland from Castlebelligham) and other inland sites roost in Dundalk Bay.

The site is internationally important for waterfowl on the basis that it regularly holds over 20,000 birds (average peak of 40,781 over five winters 1995/96-1999/00). In the same period it also qualifies as a site of international importance for supporting populations of Brent Goose (337), Black-tailed Godwit (1,067) and Bar-tailed Godwit (1,950). There is also a range of other species which occur in numbers of national importance – these are Great Crested Grebe (302), Greylag Goose (435), Shelduck (492), Mallard (763), Pintail (117), Red-breasted Merganser (121) (over 500 have

been recorded in August/September), Oystercatcher (8,712), Ringed Plover (147), Golden Plover (5,967), Grey Plover (204), Lapwing (4,850), Knot (9,710), Dunlin (11,515), Curlew (1,234) and Redshank (1,489) (all figures are average peaks over the period 1995/96 to 1999/00). Other wintering species which occur regularly in regionally important numbers include Red-throated Diver, Great Northern Diver, Cormorant, Grey Heron, Mute Swan, Wigeon, Teal, Goldeneye, Greenshank and Turnstone.

The site also supports large numbers of gulls during winter. In the 1995/96 to 1999/00 period, the following were recorded (figures are average peaks over the five winters): Black-headed Gull (6,630), Common Gull (551), Herring Gull (751) and Great Black-backed Gull (185).

In spring and autumn the site attracts a range of passage migrants, including Little Stint, Curlew Sandpiper and Ruff.

This site is one of the most important wintering waterfowl sites in the country and one of the few which regularly supports more than 20,000 waterfowl. It supports three species in numbers of International Importance and a further 15 species in numbers of National Importance. The populations of Golden Plover, Bar-tailed Godwit, Red-throated and Great Northern Divers are of particular note as these species are listed on Annex I of the EU Birds Directive. The site is also a designated Ramsar site. The site is monitored annually as part of I-WeBS.



## **APPENDIX B**

**[WHOOPER SWAN DATA 2007-2014]**







## Whooper Swan Counts in Cavan/ Monaghan 2007 - 2014

Site Name	Grid Reference	WSP3																	
		Oct	Oct	Nov	Nov	Dec	Dec	Jan	Jan	Feb	Feb	Feb	Mar	Mar	Mar	Mar	Mar	Apr	Apr
		21/10/09	22/10/09	17/11/09	18/11/09	08/12/09	09/12/09	19/01/10	20/01/10	01/02/10	09/02/10	10/02/10	01/03/10	11/03/10	12/03/10	19/03/2010	30/03/2010	08/04/10	09/04/10
Dromore Wetlands (Derryrook Mullanary etc)	H678212																		
Lough Namachree	H745099	0	0	0	0	20	20	23	23		0	0		0	0			0	5
Ballintra	H745203	0	0	0	0			16	16				14		0				
Shantonagh Lough	H758108	0	0	0	4			0	17		0	0		0	0			16	
Beagh Lough/ Greaglone																0			
Tullyvaragh Upper /	H853089	0	0		0		20		35			58			0			0	
Lough Avaghon	H 688 132																		
Milltown Lough	H710039	0	0	0	0				0			0						0	
Corvally Lough																	0		
Lough Nagarnaman	H820110	0	0		0				0			0			26			0	
Comertagh Lough	H761033	0	0		0				0			5			16			12	0
Derrynalobinagh	H705200	0	0	0	0				0			0			0			0	
Raferagh (pond)	H759046															4			
Barnagrow Lough	H670073												29		0				
Bellatrain Lough	H740107																		
Creeve lake	H7216	0	0		2		13		7	8			12	5		3		4	
Ballyhoe Lough / wetlands	H8495													71		0			
Lisnakillebane Lough	H727112	0	0	4	0			0	0				15		0	0		0	5
Lurgacham (Lough + fields)	H747134																		
Mill Lough	H756037																		
Lough Nahinch / Tassan/ White	H784268														12	12			
Lough Morne	H7613	0	0		0	0	0		0		0	0		0	0			0	0
Corrawaddy Lough																			
Crossduff Lough	H759139						6		14	14		0	0		0	0		0	
Tievaleny Lough	H739131																		
Annaghierin Lough	H699038	0	0		0				0				0		0				
Bawn Lakes	H7110	0	0		0				0				0		0			0	
Black Lough																			
Blaney Castle Lake or Muckno Lough	H844206																		
Boraghy Lake																			
Bocks Lough																			
Cambo Lough																			
Cappagh River Area																			
Cardoo Lough																			
Clay Lake																			
Corliss Lough	H888178																		
Corraghy Lough	H686050																		
Creevekeeran	H898147									10			0		0				
Creevy Lough	H830070	0	0		0				8				0		0			0	
Crossbane Lough Area																			
Derrygoony Lough	H700107																		
Derryrook																			
Drumgallon																			
Drumharriff Lough																			
Drumillard lough	H858117	0	0		0		0		0			0			0			0	
Druminnick Lough	H689057								35	30			7	7		0			
Drumlougher	H895185																		
East Laragh Lough 2	H850227	0	0		0				0				0		0			0	
Fane River	H880136																		
Killygola Lough																			
Kiltybane Lough	H895196																		
Lackagh	H780236								5				0		0				
Lantaur	H710224																		
Laragh Lough	H7922	0	0		0				0				0		0			0	
Lismagurshin or Cremartin	H774243																	2	
Lough Alina	H884182																		
Lough Dermot																			
Lough Egish	H7913	0	0	0	0	0	0	0	0		0	0		0	0			0	0
Lough Major	H7220	0	0	0	0				0				0		0				
Lough Patrick	H885190	0	0		0				0				28		0			13	
Lough Ross	H880160	0	0		0		0		0				0		0			0	
Lough Sillan	H700066	0	0		0				0				0		0			0	
Lough Tacker																			
Lough Smiley (I north)	H820220	0	0	0	0				0						0			0	









Site Name	Grid Reference	Whooper Swan Counts in Cavan/ Monaghan 2007 - 2014					
		WSP4					
		Apr 03/04/11	Apr 05/04/11	Apr 07/04/11	Apr 08/04/11	Apr 12/04/11	Apr 14/04/11
Dromore Wetlands (Derryroosk Mullanary etc)	H678212						
Lough Namachree	H745099	0	0	9	9		0
Ballintra	H745203	0	0			0	
Shantonagh Lough	H758108	0	0	0	0		
Beagh Lough/ Greaglone		0	0	0	0	0	
Tullyvaragh Upper / Moylan Lough	H853089	0		0	0		
Lough Avaghon	H 688 132						
Miltown Lough	H710039	0	0	0	0		
Corvally Lough		0	0	0	0		
Lough Nagarnaman	H820110	0	1	0	0	0	
Comertagh Lough	H761033	0	4	0	0	0	
Derrynalooabinagh	H705200	12	0			0	
Raferagh (pond)	H759046	0	0	0	0	0	
Barnagrow Lough	H670073			0			
Bellatrain Lough	H740107		0	0			
Creeve lake	H7216	0	0	0			
Ballyhoe Lough / wetlands	H8495						
Lisnakkilwbane Lough	H727112	0	0	0	0		
Lurgacham (Lough + fields)	H747134		0	0	0		
Mill Lough	H756037	0	0	0	0	0	
Lough Nahinch / Tassan/ White	H784268		0	0	0	0	
Lough Morne	H7613	0	0	0	0		
Corrawaddy Lough							
Crossduff Lough	H759139	0	0	0		0	
Tievaleny Lough	H739131		0				
Annaghierin Lough	H699038			0			
Bawn Lakes	H7110		0	0			0
Black Lough							
Blaney Castle Lake or Muckno Lough	H844206		0	0	0		
Boraghy Lake							
Bocks Lough							
Cambo Lough							
Cappagh River Area							
Cardoo Lough							
Clay Lake							
Corliss Lough	H888178	0					
Corraghy Lough	H686050						
Creevekeeran	H898147						
Creevy Lough	H830070		0			0	
Crossbane Lough Area							
Derrygoony Lough	H700107			0			0
Derryroosk							
Drumgallon							
Drumharriff Lough							
Drumillard lough	H858117	0	0			0	
Druminnick Lough	H689057						
Drumlougher	H895185						
East Laragh Lough 2	H850227						
Fane River	H880136		0		0		
Killygola Lough							
Kiltybane Lough	H895196						
Lackagh	H780236	0	0	0	0		
Lantaur	H710224						
Laragh Lough	H7922	0	0	0	0		
Lismagurshin or Cremarin Lough	H774243	0	0				
Lough Alina	H884182	0	0				
Lough Dermot							
Lough Egish	H7913	0	0	0	0		
Lough Major	H7220	0	0			0	
Lough Patrick	H885190	0	0	0	0		
Lough Ross	H880160	0	0				
Lough Sillan	H700066	0	0	0	0		0
Lough Tacker							
Lough Smiley (I north)	H820220	0	0	0	0		
Moyduff Lough							
Muckno Mill Lough	H840227	0	0	0	0	0	
Muckno Mill Lough (Tributary)	H842234	0	0	0	0	0	
Muddy Lough							
Mullaghard Lough							
Mullyore flood	N859983						
Muff Lough							
*Rectory Lake							
Shinan Lough							
Steelpetons Lough							
St. Peter's Lough							
Tassan Lough							
Tonyscallan Lough	H762208	0		0	0		
Tooncrinkell Lough	H766196	0		0	0		
Tullyvaragh Lower	H846097						









Whooper Swan Counts in Cavan/ Monaghan 2007 - 2014

Site Name	Grid Reference	WSP6																			
		Dec	Dec	Dec	Dec	Jan	Jan	Jan	Jan	Jan	Jan	Jan	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Feb
		18/12/12	19/12/12	26/12/12	31/12/12	03/01/13	9/01/01/13	10/01/13	15/01/13	16/01/13	31/01/13	01/02/13	04/02/13	10/02/13	12/02/13	14/02/2013	21/02/13	22/02/13	23/02/13	25/02/13	26/02/13
Dromore Wetlands (Derryroosk Mullanary etc)	H678212															0					
Lough Namachree	H745099		0		0		0		0		25		0		0	0				14	
Ballintra	H745203			0	0	0			0						0	0					
Shantonagh Lough	H758108		18				0		23	23	0		0		0	0				0	
Beagh Lough/ Greaglone							0				0		0		0					0	
Tullyvaragh Upper / Moylan Lough	H853089			16	23		18		22		23	23	25	25		0	34		25		
Lough Avagbon	H 688 132																				
Milltown Lough	H710039					0	24		4		13		0		0					19	
Corvally Lough							0				0		0		0					0	
Lough Nagarnaman	H820110		0						0			0		0		0	0			0	
Comertagh Lough	H761033						24		0		0	0	0		0					0	
Derrynalobinagh	H705200		0						0						0	1				0	
Raferagh (pond)	H759046						0				0		0		0					0	
Barnagrow Lough	H670073										0		0		0					0	
Bellatrain Lough	H740107		0				0		0		0		0		0					0	
Creeve lake	H7216						0		4		4		4	0		0	4			4	
Ballyhoe Lough / wetlands	H8495						0		63				50		0					15	
Lisnakkilwbane Lough	H727112		0				11		0		0		0		0	0				0	
Lurgacham (Lough + fields)	H747134						0		0		0		0		0	17	17			16	
Mill Lough	H756037						0		0		0		0		0					0	
Lough Nahinch / Tassan/ White	H784268	0				0			0							0	0				
Lough Morne	H7613						11	11	0		11		22	11		0	0			0	
Corrawaddy Lough																					
Crossduff Lough	H759139						0		0		0		0		0	17	17			0	
Tievaleny Lough	H739131						0		0		0		0	0		0				16	
Annaghierin Lough	H699038						0		0		0		0		0					0	
Bawn Lakes	H7110						0		0		0		0		0	0				0	
Black Lough																					
Blaney Castle Lake or Muckno Lough	H844206		0	0	0		0		0		0		0		0	0				0	
Boraghy Lake																					
Bocks Lough																					
Cambo Lough																					
Cappagh River Area																					
Cardoo Lough																					
Clay Lake																					
Corliss Lough	H888178						0		0		0		0		0					0	
Corraghy Lough	H686050						0		0		0		0		0					0	
Creevekeeran	H898147						0		0		0		0		0	0				0	
Creevy Lough	H830070		0	0	0				0						0	0				0	
Crossbane Lough Area																					
Derrygoony Lough	H700107								6		0		0		0					0	
Derryroosk																					
Drumgallon																					
Drumharriff Lough																					
Drumillard lough	H858117			0	0		0		0				0		0					0	
Druminnick Lough	H689057						0		0		0		0		0					0	
Drumlougher	H895185						0		0		0		0		0					0	
East Laragh Lough 2	H850227						0		0		0		0		0	0				0	
Fane River	H880136						0		0		0		0		0	0				0	
Killygola Lough																					
Kiltybane Lough	H895196						0				0		0		0	0				0	
Lackagh	H780236												0		0	0					
Lantaur	H710224														0	0					
Laragh Lough	H7922	0	0			0	0				0		0		0	0			4		
Lismagurshin or Cremartin Lough	H774243	0													0	0					
Lough Alina	H884182		0		0		0		0		0		0		0	0				0	
Lough Dermot																					
Lough Egish	H7913		0				0				0		0		0	0				0	
Lough Major	H7220		0			0			0	0					0	0				0	
Lough Patrick	H885190		0	0	0	0	0		0		0		3		0	0			14	0	
Lough Ross	H880160		0			0	0		0		0		0		0	0				0	
Lough Sillan	H700066					0	0		0		0		0		0					0	
Lough Tacker																					
Lough Smiley (I north)	H820220					0	0		0		0				0	0				0	
Moyduff Lough																					
Muckno Mill Lough	H840227		0			0	0		0		0		0		0	0				2	
Muckno Mill Lough (Tributary)	H842234						0		0		0		0		0	0				0	
Muddy Lough																					
Mullaghard Lough																					
Mullyore flood	N859983																				
Muff Lough																					
*Rectory Lake																					
Shinan Lough																					
Steelpetons Lough																					
St. Peter's Lough																					
Tassan Lough																					
Tonyscallan Lough	H762208		0			0			0						0	0					
Tooncrinkell Lough	H766196	0	0			0			0						0	0					
Tullyvaragh Lower	H846097														0						

		Whooper Swan Counts in Cavan/ Monaghan 2007 - 2014																
		WSP6																
Site Name	Grid Reference	Feb	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Apr	Apr	Apr	Apr	Apr
		28/02/13	01/03/13	02/03/13	06/03/13	07/03/13	14/03/13	15/03/13	20/03/13	21/03/13	22/03/13	26/03/13	27/03/13	03/04/13	04/04/13	05/04/13	08/04/13	09/04/13
Dromore Wetlands (Derryroosk Mullanary etc)	H678212		0															
Lough Namachree	H745099		0				34		0		0		0	11			0	
Ballintra	H745203	0	0		0	0			0		0		0	0			0	
Shantonagh Lough	H758108		17				0		0		0		0	0			0	
Beagh Lough/ Greaglone			0				0				0	0	0	0			0	0
Tullyvaragh Upper / Moylan Lough	H853089			22		40	4	34	1	15			0	0	0	0		
Lough Avagham	H 688 132																	
Milltown Lough	H710039						0							0			0	
Corvally Lough			0				0				0	0		0			0	0
Lough Nagarnaman	H820110					0	0		0	0			0	0			0	
Comertagh Lough	H761033		0				0				0	0	0	0			0	0
Derrynalobinagh	H705200		0			0			0				0	0			0	
Raferagh (pond)	H759046		0				0				0	0		0			0	0
Barnagrow Lough	H670073						0							0			0	
Bellatrain Lough	H740107		0				0		0		0			0			0	
Crevee lake	H7216		25				13		18					10			0	
Ballyhoe Lough / wetlands	H8495																4	
Lisnillewbane Lough	H727112		0				0		0					0			0	
Lurgacham (Lough + fields)	H747134						0		0		0			0			0	
Mill Lough	H756037		0				0		0		0	0		0			0	0
Lough Nahinch / Tassan/ White	H784268	0	0		0	0			0	0			0	0			0	
Lough Morne	H7613		0		0		0		0		0			0			0	
Corrawaddy Lough																		
Crossduff Lough	H759139		0				0		0		0			0			0	
Tievaleny Lough	H739131						0				0			0			0	
Annaghierin Lough	H699038						0							0			0	
Bawn Lakes	H7110		0				0		0		0			0			0	
Black Lough																		
Blaney Castle Lake or Muckno Lough	H844206					0	0		0							0		0
Boraghy Lake																		
Bocks Lough																		
Cambo Lough																		
Cappagh River Area																		
Cardoo Lough																		
Clay Lake																		
Corliss Lough	H888178						0								0			0
Corraghy Lough	H686050						0			0					0			0
Creveekeeran	H898147					0	0			0					0			0
Creivy Lough	H830070						0			0				0				0
Crossbane Lough Area																		
Derrygoony Lough	H700107														0			0
Derryroosk																		
Drumgallon																		
Drumharriff Lough																		
Drumillard lough	H858117		0				0		0					0				0
Druminnick Lough	H689057						0			0				0				0
Drumlougher	H895185						0							0				0
East Laragh Lough 2	H850227		0			0	0		0		0			0				0
Fane River	H880136					0	0		0	0				0				0
Killygola Lough																		
Kiltybane Lough	H895196					0	0		0					0				0
Lackagh	H780236					0			0					0				0
Lantaur	H710224					0			0					0				0
Laragh Lough	H7922					0	0		0	0				0				0
Lismagurshin or Cremartin Lough	H774243	0	0		0	0			0	0				0				0
Lough Alina	H884182					0	0		0					0				0
Lough Dermot																		
Lough Egish	H7913		0			0	0		0					0				0
Lough Major	H7220		0			0	0		0					0				0
Lough Patrick	H885190			42		0	0		0					0				0
Lough Ross	H880160					0	0		0					0				0
Lough Sillan	H700066		0				0		0		0			0				0
Lough Tacker																		
Lough Smiley (I north)	H820220		0			0	0		0		0			0				0
Moyduff Lough																		
Muckno Mill Lough	H840227			3		3	0		0					0				0
Muckno Mill Lough (Tributary)	H842234					0	0		0					0				0
Muddy Lough																		
Mullaghard Lough																		
Mullyore flood	N859983																	
Muff Lough																		
*Rectory Lake																		
Shinan Lough																		
Steelpetons Lough																		
St. Peter's Lough																		
Tassan Lough																		
Tonyscallan Lough	H762208	0			0	0			0					0	0			0
Tooncrinkell Lough	H766196	0	0		0	0			0					0	0			0
Tullyvaragh Lower	H846097						30	34	0	0				0	0	0		0



Whooper Swan Counts in Cavan/ Monaghan 2007 - 2014

Site Name	Grid Reference	WSP7																				
		Jan	Jan	Jan	Jan	Feb	Feb	Feb	Feb	Feb	Feb	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Apr	Apr
		13/01/14	14/01/14	23/01/14	27/01/14	05/02/14	10/02/14	11/02/14	24/02/14	25/02/14	28/02/14	04/03/2014	07/03/14	12/03/04	13/03/14	14/03/14	20/03/14	21/03/14	24/03/14	27/03/14	01/04/14	02/04/14
Dromore Wetlands (Derryroosk Mullanary etc)	H678212																					0
Lough Namachree	H745099			8	17		28	0	32					0		26						0
Ballintra	H745203	0			0		0		3	0				25	0	14				14	0	0
Shantonagh Lough	H758108			0	0				0					25	0				0			0
Beagh Lough/ Greaglonge				24	0				11	2				0	0				0		0	0
Tullyvaragh Upper / Moylan Lough	H853089	14		13	13	16	14						16								3	0
Lough Avaghon	H 688 132			0					19					0							3	0
Milltown Lough	H710039			0	0		10	9	6					0				0				0
Corvally Lough				0	12		0	0	0					0	0					0	0	0
Lough Nagarnaman	H820110	0		0	0	0	0		0			0		0	0				0	0	0	0
Comertagh Lough	H761033			0	0	0	0		0					0	0					0	0	0
Derrynalooabinagh	H705200			0	0	0	0		0					0	0				0	0	0	0
Raferagh (pond)	H759046			0	0		0	0	0					0	0				0	0	0	0
Barnagrow Lough	H670073			0	0		0	0	0					0	0				10			0
Bellatrain Lough	H740107			0	0		0	0	0					0	0							0
Creeve lake	H7216			9	0		0		4					0	6				9			0
Ballyhoe Lough / wetlands	H8495																					8
Lisnakillewbane Lough	H727112			4	0		2	0	0					0	0				0			0
Lurgacham (Lough + fields)	H747134			0	0		0	0	0					0	0				0			0
Mill Lough	H756037			2	0		0	0	0					0	0					0	0	0
Lough Nahinch / Tassan/ White Lough Mone	H784268 H7613			0	0		0	0	0					0	0				0	0	0	0
Corrawaddy Lough			3											3								0
Crossduff Lough	H759139			0	0		0		0					0								0
Tievaleny Lough	H739131						1		0					0								0
Annaghierin Lough	H699038			0	0		0	0	0					0					0			0
Bawn Lakes	H7110			0	0		0	0	0					0	0				0			0
Black Lough				0	0		0	0	0					0					0			0
Blaney Castle Lake or Muckno Lough	H844206								0					0					0			0
Boraghy Lake									0					0								0
Bocks Lough				0	0			0	0					0	0							0
Cambo Lough														0					0			0
Cappagh River Area														0								0
Cardoo Lough														0								0
Clay Lake														0								0
Corliss Lough	H888178	0		0	0	0	0		0				0						0	0		0
Corraghy Lough	H686050			0	0		0		0					0					0			0
Creevekeeran	H898147													0								0
Creevy Lough	H830070	0		0	0	0	0		0					0					0	0	0	0
Crossbane Lough Area			0											0								0
Derrygoony Lough	H700107								0					0					0			0
Derryroosk														0					0			0
Drumgallon														0								0
Drumharriff Lough														0								0
Drumillard lough	H858117	0		0	0	0	0		0					0					0	0		0
Druminnick Lough	H689057			0	0			0	0					0								0
Drumlougher	H895185													0								0
East Laragh Lough 2	H850227	0		0	0	0	0		0					0					0	0	0	0
Fane River	H880136													0								0
Killygola Lough		0		0	0	0	0		0					0					0	0		0
Kiltybane Lough	H895196													0								0
Lackagh	H780236			0	0				0					0					0			0
Lantaur	H710224								0					0								0
Laragh Lough	H7922	0		0	0	0	0		0					0					0	0	0	0
Lismagurshin or Cremartin Lough	H774243			0	0				0					0								0
Lough Alina	H884182	0		0	0	0	0		0					0					0	0		0
Lough Dermot				0	0			0	0					0								0
Lough Egish	H7913			0	0			0	0					0					0	0	0	0
Lough Major	H7220			0	0		0		0					0	0				0	0	0	0
Lough Patrick	H885190	0		0	0	0	0		0					0					0			0
Lough Ross	H880160	0		0	0	0	0		0					0					0			0
Lough Sillan	H700066			0	0				0					0					0			0
Lough Tacker		0		0	0	0	0		0					0					0	0		0
Lough Smiley (I north)	H820220			0	0				0					0					0			0
Moyduff Lough																			0			0
Muckno Mill Lough	H840227	0		0	0				0					0								0
Muckno Mill Lough (Tributary)	H842234					0								0								0
Muddy Lough							0		0					0								0
Mullaghard Lough				0			0		0					0					0			0
Mullyore flood	N859983													0								0
Muff Lough			0						0					0					0			0
*Rectory Lake														0								0
Shinan Lough					0		0							0					0			0
Steelpetons Lough														0								0
St. Peter's Lough		0		0	0	0	0		0					0					0			0
Tassan Lough				0	0		0		0					0								0
Tonyscallan Lough	H762208	0		0	0		0		0					0					0	0	0	0
Tooncrinkell Lough	H766196			0	0		0		0	0				0					0			0
Tullyvaragh Lower	H846097													0					0			0











Sites	Grid References	WSP4	
		Apr	Apr
		13/04/11	15/04/11
Fyanstown (area)	N7875		0
Yellow River	N8377		
Cruicetown	N795855		0
Headford	N755763		
Grange	N770774		
Tara Mines T.P	N840710		
Balrath	N715728		0
Newtown	N798840	0	
Balrath Demense	N702736		0
Pepperstown	N735730		
Balgeeth	N7072		0
Calliaghstown	N729748		
Yellow River 2	N827775		
Batterstown	N877696	0	0
Drakerath	N814804		
Sedenrath (area)	N7675		11
Fordstown	N7269		0
Clooney lough	N824819	0	0
SE of Trim	N728521		
Clooney 2 (fields)	N815818	0	0
Breakey Lough	N736902	0	0
Carlanstown	N7880		
Camaross	N689775		
Cruicetown 2	N794848		
Bloomsbury	N782747		0
Teltown	N813725		
Rahendrick	N676795		
Whitewood Lough	N794883	0	0
Cannonstown	N737734		
Red Island	N807775		
Breaky Lough Little	N740911	0	0
Mullagheven CS.	N787838	0	
Emlagh	N7978		
Ervey Lough	N762942	0	0
Lough Ramor callows			
Ballybeg	N 769 725		
Newcastle Lough	N793909	0	0
Coolaliss	N799816		
Cruicetown 3			
Athboy River Valley	N75, 76		
Barfordstown	N7273		0
Black Lough	N6868		0
Cookstown Great	N753727		0
Donnapatrick			
Drumbaragh			
(flood west of)			
Knightsbrook River Valley	N8052 - 8356		
Liscartan	N8370		0
Mullagh Lough	N679875	0	0
Nr Tara Mines	N8672		
Oristown			
Randelstown	N8472		
River Boyne Valley	N75, 76,85,86		
Tankardstown	N8171		0
Wilkinstown Area			







Whooper Swan Counts in Meath 2007 - 2014

Sites	Grid References	WSP6																		
		Oct	Oct	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Nov	Dec	Dec	Dec	Dec	Dec
		25/10/12	26/10/12	01/11/12	02/11/12	07/11/12	08/11/12	13/11/12	14/11/12	22/11/12	23/11/12	26/11/12	27/11/2012	28/11/12	29/11/12	05/12/12	06/12/12	07/12/12	12/12/12	13/12/12
Fyanstown (area)	N7875	0	0		0	0	0	0	0	10	0	6		11		0	10		0	
Yellow River	N8377	0		0	0		0	0	0					0			0			
Cruicetown	N795855												0							
Headford	N755763	0			0		0		0		0			0			0		0	
Grange	N770774	0			0				0		0						0			
Tara Mines T.P	N840710	0		0	0				0											
Balrath	N715728	0			0	0	0	0	0			0		0		0	0		0	
Newtown	N798840		0		0		0		0			0				0	0		0	
Balrath Demense	N702736	0	0		0	0	0	0	0		7	0	26		40	40	62		40	
Pepperstown	N735730	0			0	0	0		0		0					0			0	
Balgeeth	N7072	0			0	0	0		0		0		0		0				0	
Calliaghstown	N729748	0			4	21			55		120	120	0			0	0		0	
Yellow River 2	N827775	0		0	0		0	0	0					0			0			
Batterstown	N877696		0		0		0		0		0					0			0	
Drakerath	N814804											55					11		72	
Sedenrath (area)	N7675	17	17		0	0	0		0		0					14			0	
Fordstown	N7269		0						0		0					0			0	
Clooney lough	N824819		0		0				0	7	0	0		0		0	0	0	0	
SE of Trim	N728521																			
Clooney 2 (fields)	N815818	0	0		0	10	9		16	14	8	0	16	0		0	0	43	0	
Breakey Lough	N736902	0	0		0				0	0	0	9	14			19			35	
Carlanstown	N7880	0	0		0				0			0				0	0	0		
Carnaross	N689775		0		17	0	0		0		0	0		0		0	0		0	
Cruicetown 2	N794848												0							
Bloomsbury	N782747	0	0		0	0	0		0	0		0				0	0		0	
Teltown	N813725	0			0				0		0						0		0	
Rahendrick	N676795				0	8			16		0	0				9			14	
Whitewood Lough	N794883	0	0		0	0	0		1		0	0				0	0	0		
Cannonstown	N737734	0	0		0	23	0		0			0				14	16			
Red Island	N807775												20						0	
Breakey Lough Little	N740911	0	0		0				0		0	0				0			0	
Mullagheven CS.	N787838		0		0				0		0					0			0	
Emlagh	N7978				0				0					0			0			
Ervey Lough	N762942	0	0		0				0			0					0		0	
Lough Ramor callows					0															
Ballybeg	N 769 725																			
Newcastle Lough	N793909	0	0		0				0			0				0			0	
Coolaliss	N799816		0		0				0			0				0			0	
Cruicetown 3																				
Athboy River Valley	N75, 76		0			0						0				0			0	
Barfordstown	N7273		0		0	0	0		0			0			0				0	
Black Lough	N6868	0			0	0	0					0				0			0	
Cookstown Great	N753727	0							0			0				0			0	
Donnapatrick																				
Drumbaragh																				
(flood west of)																				
Knightbrook River Valley	N8052 - 8356		0			0						0				0	0		0	
Liscartan	N8370	0	0		0	0			0		0	0				0			0	
Mullagh Lough	N679875		0		0	0						0				0			0	
Nr Tara Mines	N8672	0			0				0	0						0			0	
Oristown																				
Randelstown	N8472				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
River Boyne Valley	N75, 76,85,86		0		0	0			0			0				0			0	
Tankardstown	N8171	0	0		0	0	0		0		0	0				0	0		0	
Wilkinstown Area		0	0						0							0	0	0	0	



Sites	Grid References	Whooper Swan Counts in Meath 2007 - 2014											
		WSP6											
		Feb	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Mar	Apr	Apr
		28/02/13	01/03/13	04/03/13	05/03/13	12/03/13	13/03/13	15/03/13	21/03/13	26/03/13	27/03/13	08/04/13	10/04/13
Fyanstown (area)	N7875	0	0	0	0	0	0		0	0	0	0	0
Yellow River	N8377	0		0	0		0		0	0		0	
Cruicetown	N795855												
Headford	N755763	0		0	0		0		0	0		0	
Grange	N770774	0		0	0		0		0	0		0	
Tara Mines T.P	N840710	0							0	0			
Balrath	N715728		0	0	0	0	0		0	0	0	0	0
Newtown	N798840	0		0	0	0			0	0	0		0
Balrath Demense	N702736		0	53	0	0	0		0	0	8	0	0
Pepperstown	N735730		0	0		0				0	0		0
Balgeeth	N7072		65	0	0	29	23		11	0	0	2	0
Calliaghstown	N729748		0	0		0				0	0		0
Yellow River 2	N827775	0		0	0		0		0	0		0	
Batterstown	N877696	0				0				0	0		0
Drakerath	N814804	0		0						0			
Sedenrath (area)	N7675	0		0	0	0	0		0	0	0	0	0
Fordstown	N7269		0			0					0		0
Clooney lough	N824819	0		0	0	0	0		0	0	0	0	0
SE of Trim	N728521												
Clooney 2 (fields)	N815818	0		0	0	0	0		0	0	0	0	0
Breakey Lough	N736902		6	0		0				0	0		0
Carlanstown	N7880	0		0	0	0	0		0	0	0	0	0
Carnaross	N689775		0	0		0			0	0			0
Cruicetown 2	N794848												
Bloomsbury	N782747	0	0	0		0	0		0	0	0	0	0
Teltown	N813725	0			0		0		0	0		0	
Rahendrick	N676795		26	22		31			0	0	0		0
Whitewood Lough	N794883	0			0	0	0		0	0	0	0	0
Cannonstown	N737734		0	0		0				0	0		0
Red Island	N807775	0			0		0		0	0		0	
Breaky Lough Little	N740911		0	0		0				0	0		0
Mullagheven CS.	N787838	0		0	0	0	0		0	0	0	0	0
Emlagh	N7978	0		0	0		0		0	0		0	
Ervey Lough	N762942		0			0				0	0		0
Lough Ramor callows				1									
Ballybeg	N 769 725												
Newcastle Lough	N793909	0		0		0				0	0		0
Coolaliss	N799816	0		0	0	0	0		0	0	0	0	0
Cruicetown 3													
Athboy River Valley	N75, 76	0				0		0	0	0	0		0
Barfordstown	N7273			0		0				0	0		0
Black Lough	N6868		0			0				0	0		0
Cookstown Great	N753727		0			0				0	0		0
Donnapatrick													
Drumbaragh													
(flood west of)													
Knightbrook River Valley	N8052 - 8356	0				0		0			0		0
Liscartan	N8370		0	0		0				0	0		0
Mullagh Lough	N679875		0			0				0	0		0
Nr Tara Mines	N8672	0		0	0		0		0	0		0	
Oristown													
Randelstown	N8472	0	0	0	0	0	0	0	0	0	0	0	0
River Boyne Valley	N75, 76,85,86	0		0		0		0		0	0		0
Tankardstown	N8171	0			0	0	0		0	0	0	0	0
Wilkinstown Area		0			0	0	0		0	0	0	0	0

Whooper Swan Counts in Meath 2007 - 2014

Sites	Grid References	WSP 7																					
		Oct	Nov	Dec	Dec	Jan	Jan	Jan	Jan	Jan	Feb	Feb	Feb	Feb	Feb	Feb	Feb	Mar	Mar	Mar	Mar	Apr	Apr
		31/10/13	21/11/13	05/12/13	17/12/13	03/01/14	08/01/14	13/01/14	14/01/14	30/01/14	03/02/14	07/02/14	11/02/14	13/02/14	14/02/14	21/02/14	24/02/14	04/03/14	14/03/14	20/03/14	28/03/14	01/04/14	02/04/14
Fyanstown (area)	N7875	0	0	0	0	0	110	4	0	0	0	0	30	0			0	0	0	0	0		
Yellow River	N8377	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0		0	0	0	
Cruicetown	N795855	0	0	0	0	60			50		0		6	0	0	20	51	28	0	0		0	
Headford	N755763		0	0	0		0	0	0	0	0			0	0		0	0	0				
Grange	N770774	0	0	0		0	0	0	0	0	0			0	0		0	0		0	0	0	
Tara Mines T.P	N840710	0	0	0	0					0			0		0		0	0	0	0	0	0	
Balrath	N715728	0	0	0	0	7	28	36			0	0			0		0	0	0	0	0	0	
Newtown	N798840	0			0						0		0	0		0	0	0		0	0	0	
Balrath Demense	N702736	0		0	0	0	0	0			0	4	4	3	0		0	0	0	0	0	0	
Pepperstown	N735730	0	0	0		0	0	0			0		0	0	0		0	0	0	0	0	0	
Balgeeth	N7072				0	0	0	0			0		0				0			0	0	0	
Calliaghstown	N729748	0		0									0				0	0		0	0	0	
Yellow River 2	N827775	0	0	0	0	0	0	0			0	0	0	0	0	0	0	0		0	0	0	
Batterstown	N877696		0		0						0		0		0		0	0	0	0	0	0	
Drakerath	N814804		0	0	0	0	0	0			0		0	0			0	0			0	0	
Sedenrath (area)	N7675	0	12	0	0	0	0	0	0	0	0		0	0	0			0	0	0	0	0	
Fordstown	N7269		0	0			0				0						0			0	0	0	
Clooney lough	N824819	0	0	0	0	0	0	0	0		0		0		0	0	0	0		0	0	0	
SE of Trim	N728521																				0		
Clooney 2 (fields)	N815818	0	0	0	0	0	0	0	0		0		0	0	0	0	0	0		0	0	0	
Breakey Lough	N736902		0	0				0	20		0	0	6	0			0	0		0	0	0	
Carlanstown	N7880	0	0	0		0	0	0	0		0	0	0		0		0	0		0	0	0	
Carnaross	N689775		0	0			0	0			0	0		0	0		0		0	0	0	0	
Cruicetown 2	N794848	0	0	0	0	0	0	0	0		0		0		0	0	0	0	0	0	0	0	
Bloomsbury	N782747	0	0	0	0	0	0	0	0	0	0		0	1	0		0	0	0	0	0	0	
Teltown	N813725	0	5	5	0	0	0	0	0	0	0		0	0	0		0	0	0	0	0	0	
Rahendrick	N676795		16	30		31	22	8			25	0		34	34		0		33		0	0	
Whitewood Lough	N794883	0	0	0			0	25	0		0	0	0	0	0	12	0	0		0			
Cannonstown	N737734	0	0	0			0				0		0	0	0		0	0	0	0	0	0	
Red Island	N807775			0			0	0			0		0				0	0			0	0	
Breakey Lough Little	N740911		0	0			0	0	0		0	0	0	0			0	0		0	0	0	
Mullagheven CS.	N787838		0	0	0		0	0			0		0	0	0	0	0	0		0	0	0	
Emlagh	N7978	0	0	0		0	0	0	0		7	6		0	6	10		0	0		0	0	
Ervey Lough	N762942		0	0				10			0		0				0	0		0			
Lough Ramor callows																0		0			0		
Ballybeg	N 769 725	0	0	0	7	0					0			0	0		0	0	0	0	0	0	
Newcastle Lough	N793909	0						0				0		0		0		0	0	0	0	0	
Coolaliss	N799816	0	0	0		0	0	0			0	0		0	0		0	0		0	0	0	
Cruicetown 3									5											0		0	
Athboy River Valley	N75, 76		0		0												0	0			0	0	
Barfordstown	N7273	0	0		0	0	0	0				0		0	0	0		0	0	0	0	0	
Black Lough	N6868		0				0										0			0	0	0	
Cookstown Great	N753727		0	0	0	0	0	0					0		0		0	0		0	0	0	
Donnapatrick		0				0			0	0		0			0		0	0	0	0	0	0	
Drumbaragh					0																0		
(small flood west of)			0	0			0	0			0					0		0			0		
Knightbrook River Valley	N8052 - 8356					0															0	0	
Liscartan	N8370		0		0	0	0	0		0			0	0	0		0	0	0	0	0	0	
Mullagh Lough	N679875												0				0			0	0	0	
Nr Tara Mines	N8672		0	0	0	0	0	0	0	0	0		0		0	0	0	0	0	0	0	0	
Oristown			0	0			0	0			0				0		0	0			0		
Randelstown	N8472		0	0	0	0	0	0	0			0					0	0	0	0	0	0	
River Boyne Valley	N75, 76,85,86			0								0					0	0	0	0	0	0	
Tankardstown	N8171	0	0	0	0	0	0	0		0	0	0		0	0		0	0	0	0	0	0	
Wilkinstown Area			0	0			0	0		0	0	0		0		0	0	0	0	0	0	0	



**APPENDIX C**  
**[TRACKING DATA]**



**Whooper Swan Satellite Tracking Data (source: <http://tracking.wwt.org.uk/maps/>)**

Bird Key	Dates	Location	Crossed Alignment
Swan05	6/4/12-13/4/12	UK Lake District.	No
	14/4/12 – 19/4/12	Returned to breeding grounds in Iceland.	
	1/11/12	Entered Ireland near Clifden.	
	2/11/12	Lough Corrib Area	
	3/11/12 – 17/11/12	Frenchpark area Roscommon	
89290 (Y5T)	1/11/09	Left Iceland	No
	2/11/09 – 3/11/09	Entering Ireland via Donegal coast. Moving SE to E Donegal, then SW towards Sligo.	
	10/11/09 – 28/12/09	NW Lough Mask, Mayo	
	1/3/10 – 26/4/10	Westport	
	26/4/10 – 17/5/10	Moved between Mayo, Sligo and Sth Donegal before leaving Ireland from NW Mayo coast.	
	5/6/10 – 9/6/10	Iceland	
89291 (A9F)	24/12/09	NW of Derry, flight to Sth of Lough Swilly	No
	25/1/10 – 10/2/10	Sth of Lough Swilly	
89292 (Y6K)	10/11/09 – 20/12/09	Nth Lough Ree	No
	21/12/09	River Bann Valley, NI – Flight NE and then E to UK (Ayr Region, Scotland)	
	24/12/09 – 28/02/10	Yorkshire, England	
89250 (U7A)	19/11/08 – 2/4/09	Peak District UK – Flew W and North along NI Coast entering Belfast Lough.	No
	1/5/09 – 15/9/09	Belfast Lough	
	13/4/09 - 22/4/09	Belfast Lough	
	5/10/09 – 4/11/09	NW Strangford Lough	
	10/11/09 – 10/12/09	Strangford Lough	
Sigrunn	16/9/09 – 15/10/09	Iceland	No
	4/11/09	SE Lough Foyle – flightpath crossing N of Lough Neagh & Strangford Lough to UK	
	5/11/09	Peak District, UK	
Jaleel (CL9)	1/11/2007	North Atlantic (sea) – entering Ireland along Nth Mayo coast	Unlikely - Direct route to north of NI Section of the line.
	3/11/07 – 2/4/08	Ballinrobe Area	
	2/4/08 – 6/4/08	North then W to sea, returning to Achill	
	6/4/08 – 12/4/08	Achill, Mayo	
	15/4/08 – 5/5/08	Belmullet	
	6/5/08	Flight to Iceland	
	1/11/08 – 30/03/09	Ballinrobe Area	
	31/03/09	Flight to Iceland	
	27/10/09	Flight from Iceland to Ayr, Scotland	
	5-8/11/09	Ayr, Scotland – Potential flightline to Ballinrobe	
	25/5/10 – 1/7/10	Ballinrobe Area, Mayo	
	Ballinderry (N3D)	11/3/08 – 16/03/08	
16/3/08		Flew over Lough- Foyle to Iceland	
18/3/08		Arrived Iceland	
Bann (N4B)	11/3/08 – 27/03/08	Nth Lough Neagh	No
	1/4/08	Arrived Iceland	
Blackwater (N3V)	11/3/08 – 16/03/08	Nth Lough Neagh	No
	19/03/08	Arrived Iceland	
Fiachra (UX3)	11/1/08 – 27/03/08	East Galway – Flight West and North towards Lough Conn, then W to sea	No
	11/5/2008	Sth of Greenland	
Maine (N3S)	11/3/08 – 29/03/08	Nth Lough Neagh	No
	1/4/08	Arrived Iceland	
Moyola (N4K)	11/3/08 – 17/03/08	Nth Lough Neagh	No
	18/3/08	Arrived Iceland	
Sixmilewater (N3T)	11/3/08 – 29/03/08	Nth Lough Neagh, flight across Lough Foyle	No
	1/4/2008	Arrived Iceland	
Conn (73X)	1/11/07 – 3/11/07	NW Scotland	No
	3/11/07	Lough Swilly	
	4/11/07 – 25/12/07	South of Lough Gill, Sligo	

<b>Bird Key</b>	<b>Dates</b>	<b>Location</b>	<b>Crossed Alignment</b>
Fiachra (UX3)	1/11/07 – 3/11/07	West from NE Scotland (flight across L Neagh to L Swilly)	No
	6/2/08 – 28/02/08	South from L. Swilly via Sligo to East Galway	
	6/2/08 – 28/2/08	East Galway	
CPA (CPA)	13/11/95	Flight from Iceland	Direct flightline crossed south of Trim – possibly crossing alignment
	17/11/95	Entered Ireland via North Mayo Coast	
	21/11/95	East Mayo/Roscommon	
	22/11/95	Flight to Central Wales	
JVN (JVN)	26/10/95	Departed Iceland	No
	31/10 – 17/11/95	Lough Foyle	