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7 Ecology

7.1 Executive Summary

1. The ecology assessment of the proposed Tyrone - Cavan Interconnector has been carried out by a team of AECOM professional ecologists, supported by Mr Tim Goodwin of Ecology Solutions.

2. Additional data from wintering bird surveys are presented which have both affirmed and confirmed the baseline submitted as part of the planning applications of the Tyrone – Cavan Interconnector.

3. Ecological concerns as presented by the opposing Statements of Case are in all cases generic and are presented as broad statements asserting:

   - Failure to address specific species, where only one of the mentioned "species" is an ecological receptor;
   - Lack of assessment on undergrounding;
   - Distance from Drumcarn ASSI;
   - "Impact on wildlife habitat"/ "adversely affect the native wildlife"; and,
   - Presence of barn owl.

4. In all instances this rebuttal provides detailed information to explain why these statements are unfounded and cross-referenced to the relevant documents in the planning applications. Nothing in the objectors' Statements of Case and representations serves to undermine the conclusions set out in the SONI Statement of Case and supporting Technical Reports. As stated in SONI's Main Rebuttal Document, the proposed Tyrone - Cavan Interconnector remains clearly acceptable in planning terms.

7.2 About the Authors

5. The professional background of the authors are set out in the Technical Report addressing this subject matter, as appended to SONI's Statement of Case.

6. The ecology assessment of the proposed Tyrone - Cavan Interconnector was carried out by a team of AECOM professional ecologists. Representing the AECOM team are Dr. Eleanor Ballard and Dr. Paul Lynas.

7. Dr. Lynas is an ecologist specialising in ornithology. He has over 15 years' post-graduate experience and is a Chartered Environmentalist (CEnv); Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and at present Dr. Lynas serves as Convenor of the Irish Section of CIEEM.

8. Dr. Lynas has particular wide-ranging experience in the assessment of linear infrastructure. During the last eight years, he has been involved at various DMRB stages of many large-scale strategic road developments across Northern Ireland. Prior to his consultancy work, Dr. Lynas worked as a Species Conservation Officer at the RSPB in Belfast. During his time there he was the lead author on the 'Birds of Conservation Concern in Ireland', the traffic light assessment tool for bird species across the country.

9. Dr. Ballard is a Chartered Environmentalist and a full member of CIEEM. Dr. Ballard has over 20 years' postgraduate experience in the environmental field. Dr. Ballard has a first class honours degree in Environmental Science and Doctorate in Plant Ecology, both from Ulster University. Her doctoral thesis was in the field of species rich grassland management. More recently, Dr. Ballard has read for a postgraduate diploma in Geographical Information Systems, the research element of which, concentrated on spatial distribution of smooth newt in Northern Ireland.

10. The ecological impact assessment for the Consolidated ES and its Addendum was written with support from Mr Tim Goodwin. Mr Goodwin is one of the leading ecologists in planning and is well known to members of the planning bar, planning solicitors and planning consultants. He provides expert evidence at inquiry, and in the courts, representing a range of blue chip companies on high profile projects.

7.3 Policy

11. No Policy issues have been raised in relation to ecology.

7.4 Guidance

12. No Guidance issues have been raised in relation to ecology.

7.5 Further Environmental Information for the Purposes of the Inquiry

13. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented to the inquiry for the purposes of the inquiry: October – December 2016 wintering bird survey results. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.

14. Information previously submitted with regard to whooper swans is summarised in Section 7.6 of this document.

15. Update surveys in October – December 2016 (Appendix A of this Rebuttal Technical Report) have confirmed the low incidence of whooper swans occurring in the vicinity of the proposed Tyrone – Cavan Interconnector. At known whooper swan sites remote from the overhead line route, additional linkages were confirmed between roosting and feeding sites, supporting the evidence that birds do not have to pass over the proposed line route on a daily basis. Birds in the Annaghroe area of Caledon were noted to travel west to Emy Lake and anecdotally to Glaslough (both in Monaghan) (Castle Leslie grounds staff and Caledon Estate Gamekeeper pers. comm). Those feeding in fields to the north of Caledon flew to Brantry Lough, one of the Tynan lakes to the north-west. The swans on the Keady lakes were again noted feeding on the fields surrounding the lakes. With the latest surveys confirming existing knowledge, no significant impacts on whooper swans at the local or national population level would be expected.

7.6 Failure to Address Specific Impacts of the Project

16. In the SEAT Statement of Case, Page 21, Paragraph 116 states:

> *"The EIS is materially deficient in numerous respects including its failure to address specific impacts of the project on certain species, such as whooper swans and beehives. (Appendix SEAT16)".*

Response

General

17. We refute the assertion that the "EIS" (meaning the Consolidated ES and its Addendum) is materially deficient in numerous or any respects. With regard to whooper swan and other ecological receptors including badger, otter, smooth newt, protected and notable habitats, bats, breeding birds and other wintering birds detailed information is provided in Chapter 10 of the Consolidated ES on:

- the methodology used in the assessments (as summarised in Section 10.2.5 of Chapter 10 of the Consolidated ES) ;
- the context and study area of all surveys, and the reasons why selected species have been scoped out of further assessment;
- the results of all surveys (as presented in Section 10.3 of Chapter 10 of the Consolidated ES); and,
- impacts without mitigation of the proposed Tyrone – Cavan Interconnector on ecological receptors and residual impacts with mitigation of the proposed Tyrone – Cavan Interconnector on ecological receptors (as presented in Section 10.5 of Chapter 10 of the Consolidated ES).

18. Details of all surveys are presented in Chapter 10 of the Consolidated ES. Appendices 10A – to 10H present the entire results of the protected species surveys carried out to inform the assessment. As per NIEA's[1] requirements in relation to mobile species, additional survey has been ongoing with further details of survey in relation to smooth newt and bats submitted in the Consolidated ES addendum and most recently bat surveys from 2015 and 2016 accompanied the SONI Statement of Case, Ecology Technical Report. To affirm the wintering bird surveys conducted to inform the assessment, additional wintering bird surveys are ongoing. Results for the October –

[1] NIEA in this context is now called the Natural Environment Division (NED), part of Department of Agriculture, Environment and Rural Affairs (DAERA).

December 2016 survey season are presented in Section 7.5 of this document with additional information presented in Appendix A of this Rebuttal Technical Report.

19. The following sections address the specific species mentioned in the SEAT Statement of Case (Page 21, Paragraph 116), although no substantial evidence of harm to any species has been provided by SEAT.

Whooper Swan

20. Following extensive consultation with relevant statutory and non-statutory bodies, specifically NED and the Irish Whooper Swan Study Group (IWSSG), it was concluded that there were no known regularly used wintering whooper swan feeding and roosting areas either historical or current, immediately in proximity to the proposed Tyrone – Cavan Interconnector. .

21. In their August 2015 consultation response and Habitats Regulations Assessment of the Scheme, the NED Conservation Science (CS) Ornithology Team state:

> *"CS considered that the methods used and standard of reporting used by the developer in carrying out the bird surveys since 2005 were good.*
>
> *"CS found that there are no ornithological issues associated with this proposal. CS in their response state that although relatively large numbers of swans frequented the survey area, no evidence was found of the species regularly flying across the line of the inter connector. Similarly, observations failed to show that swans showing a tendency to follow the line of the River Blackwater".*

22. The proposed Tyrone – Cavan Interconnector only crosses The River Blackwater at one location.

23. The River Blackwater floodplain was acknowledged to be followed by migrating and commuting whoopers and, away from the overhead line it was used extensively, such as the Annaghroe area south-west of Caledon.

24. As reported in the Consolidated ES (Chapter 10 and Appendix 10G of the Consolidated ES), frequent whooper swan surveys were carried out over a number of winters (2006/07, 2008, 2008/2009, 2010/11) in an effort to confirm that traditional wintering locations of whooper swans as identified

from historical data and through consultation were still as stated. This situation was confirmed, with only one whooper swan additional feeding site established. This additional site was recorded 1km away from the proposed line. This site held 9 swans in December 2006 and 19 in January 2009.

25. Furthermore, the 2006/07, 2008, 2008/2009, 2010/11 surveys[2] established the patterns of whooper swan movements and linkages between the roosting and feeding sites. These sites included whooper swans feeding in fields north of Caledon and using Enagh Lough to roost. Birds feeding in the Annaghroe area were noted roosting there also or travelling to Enagh Lough. At Keady lakes towards the south of the proposed line route, birds were observed feeding in the surrounding fields.

26. On a single occasion, on 1st November 2006, 9 whooper swans were observed crossing the proposed line route over the Blackwater River. Whilst none have been seen crossing the line route in all the many years of surveys since, it is acknowledged that there must be some movement of whooper swans at some point in the season, albeit at a low incidence, either on migration routes or travelling between roosting and feeding sites. The location of wintering whooper swan sites is presented in Figure 10.49 of the Consolidated ES.

27. Whilst the collision risk to whooper swans is not considered significant in the context of local populations, in an effort to reduce the risk to an absolute minimum, mitigation measures will be introduced. The fitting of flight deflectors along the line route, at the stretches where a possible collision risk has been identified, has been prescribed. This includes a length along the most northerly stretch between Moy and the Blackwater Rivers. Deflectors have been demonstrated in one recent study to reduce the incidence of swan collisions by 95% and are widely recommended by bird conservation organisations worldwide as the best method of mitigating possible collision with overhead lines.

[2] See Section 7.5 and Appendix A of this Rebuttal Technical Report for details of the 2016 survey results.

28. As mitigation for wintering birds (collision prevention), bird flight deflectors will be fitted to the earth wire between Towers 1 and 13 and Towers 30 and 43 at appropriate spacing.

29. The precise type of deflector will be agreed in advance with NED. The flight deflector will be installed at appropriate spacing from tower to tower along the earth wire. Usually made from thick wire wound around the lines or fitted plastic shapes, the deflectors will be installed as close together as possible (at least every 5-10 m), and in contrasting colours e.g. black and white for maximum visibility in different weather and light conditions. The deflectors will also require monitoring and maintenance, and if necessary replacement. Monitoring will ascertain effectiveness in preventing significant collisions and that markers remain in position and functional throughout the lifetime of the overhead line.

30. No evidence has been provided to dispute the assessment carried out either for the original surveys presented in the 2012 consolidated ES. Appendix 16 of the SoC as presented by SEAT, represents information relating to the southern section of the Tyrone – Cavan Interconnector in the Republic of Ireland. This is not representative of the situation north of the border as the geography, numbers of swans, the frequency of their occurrence and the relationships between feeding and roosting sites differ substantially.

Beehives

31. We respectfully note that a beehive is not a species, however, it is assumed that the SEAT team are referring to the impacts on Western honey bee *Apis mellifera.* Of the species of bee recorded on the island of Ireland, most do not use hives but nest underground, in plant stems and occasionally in stone.

32. The majority of the habitat in proximity to the line comprises improved agricultural grassland or poor semi improved grassland. Such habitats are recognised to have a very low flowering plant assemblage and as such do not provide a significant source of nectar to any of native bee species in Northern Ireland. The dominant plant species within grassland are graminoid species which are almost exclusively wind pollinated and the requirement of

bees in these habits is low. Bees have a symbiotic relationship with plants in the form of mutualism, whereby both species benefit from the relationship. In the case of the habitats surrounding the interconnector the lack of flowering plants requiring insect pollination and lack of flowering plants providing nectar indicate that the loss of small areas of habitat to accommodate the tower bases and the somewhat larger area to accommodate the substation will not impact the local bee population.

33. The Western honey bee and their associated hives are a domesticated feature of agriculture. Impacts on hives has been dealt with in Chapter 7 (EMF) of the Consolidated ES, whereby it is explained that the overhead line and the substation are compliant with UK policy, and that there is (with minor exceptions i.e. an effect of the electric fields on the structure of beehives) no effect on farming, flora and fauna. No beehives were identified by landowners that would require mitigation for this impact. No analysis is presented by SEAT to dispute overall findings in this respect and this issue is dealt with in more detail in the Rebuttal Technical Report for EMFs.

7.7 Undergrounding

34. In the SEAT Statement of Case, Page 21, Paragraph 117 states:

> *"Any references to the ecological impact of undergrounding are of no value because it refers to a line through land rather than along public roads."*

Response

35. As stated in Appendix 10.2 of the Consolidated ES Addendum, in the case of the Tyrone-Cavan Interconnector, SONI has not considered it feasible to install the circuits within the road network as the roads in the study area are too narrow. A standard rural road is approximately 4 to 5 metres wide. The width of the required cable working swathe would be up to 22 metres. Cross country (through land) routes were therefore considered unavoidable, hence the rigorous suite of ecology surveys conducted in these areas. As fields abutting roads in the rural study area represent a considerable ecological resource in terms of hedgerows and hedgerow trees, not least road verges

themselves (which like field margins are quite often species rich), using the local road network has considerable potential to:

- impact root protection zones of woody species;
- remove larger areas of the dominant Northern Ireland Priority Habitat in the pastoral landscape: hedgerows; and,
- impact on protected species, such as badgers and bats that rely on hedgerows in this ecologically depauperate landscape.

36. Furthermore, the tower locations of the current proposal have been carefully designed following the tenet of mitigation by avoidance, in that vegetation removal has been minimised in the current design. If either the rural road network or a cross country route were used for undergrounding, the amount of vegetation that would need to be removed would be greater than the vegetation removal required for the overhead line route and towers in the proposed Tyrone – Cavan Interconnector.

7.8 Drumcarn ASSI

37. In Mr. James McNally's Statement of Case, Page 3, Paragraph states:

> *"A cursory look at the detail maps of the proposed powerline before it crosses the border after pylon 107 clearly indicates that the 400Kv powerlines are not sufficiently removed from the Drumcarn area of Special Scientific Interest (ASSI 182) and construction activities in this area is likely to have a significant negative adverse impact on ASSI 182."*

Response

38. The ecological impact assessment has considered the impacts of the proposed Tyrone – Cavan Interconnector on designated sites in proximity to the development as part of the Consolidated ES and its Addendum. This bald statement from the Mr McNally is not supported by any evidence. Far more than a "cursory look" was conducted during the assessment, with specialists assessing the ecological impacts (Chapter 10 of the Consolidated ES), air quality (Chapter 9 of the Consolidated ES Addendum) and hydrological connectivity and potential effects of dewatering of local wetlands (Chapters 8 and 9 of the Consolidated ES). Further rebuttal on dewatering

is provided in the Rebuttal Technical Report for Soils and Geology. In summary, there will be no dewatering effects on Drumcarn ASSI.

39. It was determined that there are 26 ASSI and one NHA within 30km of the proposed overhead line route. Ecologically, there are no pathways for the overhead line to have impacts on any ASSI that is designated for its habitat, plant or invertebrate species features.

40. As identified in Chapter 9 (Air Quality and Climate Change) of Consolidated ES Addendum, the proposed haul routes for traffic accessing some of the tower construction sites associated with the Tyrone - Cavan Interconnector will pass within 200m of the Drumcarn ASSI. As stated in Paragraph 105, Page 122, Chapter 9 of the Consolidated ES Addendum: *"Because of the limited number of construction vehicles compared to existing traffic conditions … there will be no likely significant effect…"* to Drumcarn ASSI.

41. Detailed assessment of the cumulative and transboundary effects of the towers extending into Ireland[3] have been assessed in Chapters 5 and 6 of the Consolidated ES Addendum, in the Joint Environmental Report (Appendix 2.1 of the Consolidated ES Addendum) and in Volume 3C Chapter 6 Flora and Fauna Chapter of the EirGrid EIS (Appendix 1.1 to the Consolidated ES Addendum).

42. These assessments have included:

- Ecological impacts to the Drumcarn ASSI in Northern Ireland were scoped out during the preparation of both the Consolidated ES and the associated EIS for the RoI scheme because of the absence of likely significant effects;
- Hydrological connectivity with the proposed Tyrone – Cavan Interconnector; and,
- Larval food plants for protected species with special regard to marsh fritillary were recorded during Phase 1 Habitat survey. At the tower locations in proximity to Drumcarn bog, devil's-bit scabious *Succisa pratensis*, the food plant of the marsh fritillary butterfly, was not recorded. The absence of devil's bit scabious in the study area around Towers 103

[3] Also called the Republic of Ireland.

precludes the breeding of this species in the area of the Tyrone – Cavan Interconnector. The absence of the only larval food plant of marsh fritillary in proximity to the zone of influence of the Tyrone – Cavan Interconnector confirms that the loss of vegetation to accommodate the infrastructure will not impact the Drumcarn ASSI. As marsh fritillary is not present in the working area of Tower 103, the working area for the tower bases will not be an ecological stepping stone for the species to get to the ASSI.

- The potential Drumcarn population of marsh fritillary, which, as Mr McNally points out in his Statement of Case, has not been recorded at Drumcarn since 1999. Drumcarn ASSI is outwith the zone of influence of the Tyrone – Cavan Interconnector.

43. Additionally, as stated in the Consolidated ES (Appendix 10A), NED does not consider that the line route or proposed tower locations are adjacent to habitat features used for breeding purposes by this species. The species was scoped out of the assessment.

44. Furthermore, in relation to other invertebrates referred to in Mr. McNally's Statement of Case, the avoidance of features such as wetlands, species rich grassland, and to a large degree wooded habitats (including hedgerows) will ensure that other less common invertebrate species that may be associated with these habitats will not be impacted by the proposed Interconnector either.

45. An Bord Pleanála Inspector's Report[4] for the North-South 400kV Interconnection Development was published on 21st December 2016. That report, supported by the Board's Direction, confirmed the planning approval of the proposed Interconnector in Ireland. As identified above, Drumcarn ASSI was included as part of EIS and the conclusion of the Inspector's Report states (Page 617 and 618):

> *"I have completed an environmental impact assessment in relation to the subject development, by itself and cumulatively with other development in the vicinity and which has also included consideration of all written and oral submissions received, and conclude as follows. The proposed development…*
>
> *would not seriously injure the ecology of the area, including bird life, protected species and habitats, and areas designated for environmental protection,*

[4] http://www.pleanala.ie/news/VA0017.htm

would not adversely affect the hydrology or hydrogeology of the area,

would not result in significant trans-boundary impacts."

46. Additionally, the Inspector's Report states (Page 346):

"…Marsh Fritillary has been recorded in Drumcarn Fen (the part of Drumgallan Bog that occurs in N. Ireland). Having regard to the separation distance to the alignment (600m), I consider that the alignment is sufficiently far removed from the alignment to avoid any potential impacts."

7.9 Impacts on Wildlife and Habitats

47. In the submission from Mr Whyte, the fifth paragraph states that the "*proposed pylons will destroy the habitat of wildlife*." No evidence is provided to substantiate this assertion.

48. In their submissions, Ms. Drew and Mr. Boyd Eagleson assert, but fail to explain further, that the proposed Tyrone – Cavan Interconnector will "*adversely affect the native wildlife*".

49. The submission of Ms Mallon, as part of SEAT Appendix 18, Page 4, Bullet Point 3 states that she is concerned with "wildlife in general".

Response

50. An extensive ecological assessment has been completed for the proposed Interconnector over many years. The habitats present within the survey area are generally of low value and there will be limited impacts on fauna. The routeing of the overhead line and siting of the substation has avoided key ecological features, and with the proposed mitigation, there will no significant impacts. The proposed substation is a large site but will be located in an area of generally improved grassland (agricultural land). The proposed towers are spaced out roughly 400m apart and have a small footprint. The towers are also generally located on improved grassland (agricultural land). No recognised sites of international, national or local conservation value will be adversely affected. These limited or not significant impacts have been assessed in terms of policy and legislation and have been found to be in full compliance.

51. The Planning Statement of Case of the project states that "the need for the proposal demonstrably outweighs the minimal impact on ecology." The Planning Statement of Case also states:

> *"It is also relevant that NIEA Natural Heritage (consultation reply dated 20 August 2015) "has considered the impacts of the proposal on Designated sites and other Natural Heritage interests and based on the information provided and the HRA is content with the proposal with conditions".*

52. This determination is based on the ecological assessment presented in the Consolidated ES and its Addendum.

53. In terms of ecology, habitat losses will be restricted in the main to areas of low conservation value, and there will be limited adverse impact on animal species. Permanent land take is low and habitats lost are generally of low ecological value. Animals quickly habituate to new infrastructure in the environment and with mitigation the long term effects on biodiversity will be negligible. Therefore we have determined that the proposed Interconnector will have a minimal effect on ecology with no likely significant effects.

7.10 Impacts on Barn Owl and Pheasant

54. In the submission from Mr George, Page 2, Point 6 identifies the presence of pheasant and a "*barn owl that has been seen most nights in the town land of Tullysaran.*"

Response

55. An extensive ecological assessment has been completed for the proposed Interconnector over many years. The habitats present within the survey area are generally of low value and there will be limited impacts on fauna. The routeing of the overhead line and siting of the substation has avoided key ecological features, and with the proposed mitigation, there will no significant impacts.

56. Pheasant are not a protected species and are considered to be an introduced species, raised for shooting interests. Therefore there is unlikely to be any significant effect to this species.

57. As identified in Chapter 10 of the Consolidated ES, barn owl is currently a rare species in Northern Ireland, and its nest sites are specially protected under the amended Wildlife Order because of their continued use between breeding seasons. Potential nest sites for the species were assessed during the breeding bird surveys and subsequently during the Phase 1 habitat surveys. A single building that appeared to offer a potentially suitable nest location is to be demolished (a stone built shed at the proposed substation site). Assessment for barn owl of this building and trees along the proposed route found no evidence of barn owl nesting. Furthermore, from desk top study and survey as detailed in Chapter 10 of the Consolidated ES, there are no known barn owl nest sites in the immediate vicinity of the overhead line.

58. The operational overhead line will not affect any known barn owl breeding sites. There is a potential for barn owls from elsewhere to disperse across or to winter in the vicinity of the overhead line route. However, barn owls typically fly below 4.5m when hunting, although they may fly at considerable heights when commuting between foraging areas and nest sites. In the absence of local nest sites, it is likely that any birds that may use the overhead line area will use predominately airspace lower than the height of the line. It is estimated from ring recovery data that around only 3% of barn owl deaths are the result of collision with overhead lines (Barn Owl Trust).

7.11 Conclusions

59. In conclusion, nothing in the objectors' Statements of Case and representations serves to undermine the conclusions set out in the SONI Statement of Case and supporting Technical Reports. As stated in SONI's Main Rebuttal Document, the proposed Tyrone - Cavan Interconnector remains clearly acceptable in planning terms.

Appendix A: Wintering Bird Survey Report

October – December 2016 Update Wintering Bird Survey

Tyrone – Cavan Interconnector

SONI

Project Reference: TC Interconnector

19 December 20167

Quality information

Prepared by	Checked by	Approved by
		
Conor Reid Senior Graduate Ecologist	Dr Paul Lynas Principal Ecologist	Dr Eleanor Ballard Associate Director Ecology

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Figures

1. Summary

- This document presents a report detailing wintering bird surveys carried out in October – December 2016 to update the ecological baseline for the Tyrone - Cavan Interconnector. Surveys for this report were conducted in October and November / December 2016.
- Additional surveys to complete the wintering bird surveys for the 2016 / 2017 bird survey season are planned.
- No swans were recorded during the October surveys but five flocks and a single whooper swan were recorded during the second survey period.
- The use of five surveyors allowed simultaneous surveying and swan –tracking between feeding and roosting sites.
- No swans feeding in the Blackwater Valley were observed commuting across the proposed overhead line route.
- Swan flocks foraging in the Blackwater River Valley near Caledon (RB02) and Annaghroe (RB05) were observed commuting short distances to roosting sites at Bantry Lough (TY03) and Emy Lough (all over 5km from the overhead line route).
- Whooper swans using the Keady lakes were sedentary with only short flights or walking between roosting lakes and feeding sites on adjacent fields.
- Greenland white-fronted geese and greylag geese were recorded at Annaghroe (RB06) on 30 November 2016. These birds may have remained at the site for roosting and feeding as no commuting flight was observed.
- The results of this latest round of surveys confirm the assessment as presented in the Consolidated ES and its Addendum.

2. Introduction

AECOM was commissioned by SONI to carry out wintering bird surveys to update previous surveys (2006-2011) which informed the Consolidated ES and its Addendum for the 400 Kv Tyrone – Cavan Interconnector. The study area follows the proposed substation site, the proposed overhead line route and includes the surrounding landscape which is known to support wintering populations of migratory birds (Figure 1).
Whooper swans are likely to be present within the study area from (mid) October onwards[1], and therefore surveys commenced in October 2016 with three survey periods planned throughout the winter. The second survey was conducted in November / December 2016. The third and final survey will be carried out in January/February 2017. This report therefore only includes the results of the first two surveys carried out to date. The results of the final survey will be presented in the final report.

2.1 Personnel

The work was carried out by experienced AECOM ecologists with experience in ornithology. The team was led by Dr Paul Lynas, with additional support from Conor Reid, Jenny Jones, Talek Renals and Jemma Heyburn. Additional support was requested where necessary from within the AECOM Ecology and Environmental teams.

3. Methodology

The survey and assessment methodology, data analysis and reporting largely replicated the 'four survey element' approach of AECOM's previous surveys (2006-2011) devised in consultation with NIEA, IWSSG and the RSPB. However, the survey methodology was augmented by the use of five surveyors in radio contact, which allowed simultaneous surveying and swan-tracking between feeding and roosting grounds.

Additional relevant data/guidance has become available since 2012, from sources including the draft EirGrid Evidence-Based Studies published in 2016, and Scottish Natural Heritage guidance published in 2016, and swan data from relevant sources. These new sources will be considered in combination with our completed findings to aid fuller understanding and interpretation of the survey results. The methodologies to complete the four elements are described in this section in detail.

Element 1: Use of the overhead line route by foraging whooper swans

A corridor, approximately 500m wide, but wider where conditions appeared more suitable for the target species, was surveyed to establish whether swans were feeding within the immediate vicinity of the proposed overhead line and substation site. Survey was conducted entirely from road, farm tracks and vantage points where possible. It was estimated that approximately 95% of the line route was either visible by this means or deemed unsuitable as foraging habitat for swans – e.g. small fields surrounded by tall hedgerows or characterised by steep slopes, dense scrub etc..

Each survey visit recorded any presence (complete with a count) of whooper swans and the field within the corridor in which they occurred. All other swans, geese and notable species were also recorded.

During each survey period, driving transects along the entire corridor (including the substation site) were completed at least once. On occasions, when travelling through the survey area, further observations of swan presence / absence were made. During late 2016, the entire route was surveyed at least twice and will be visited again before February 2017.

Element 2: Use of Blackwater River valley as a commuting/migration route for whooper swans

The Blackwater River valley was surveyed during two survey periods during late 2016 and will be surveyed again before February 2017. This was in order to evaluate the possible use of the river valley by swans commuting between their roosting and feeding sites. Several vantage points near the proposed crossing point of the overhead line route over valley were used to observe any swan movements along the valley during the two hours immediately after daybreak and during the three hours immediately preceding last light. A half hour period was also spent in darkness (both before first light and after last light) to ensure no further bird movements were noted. Each vantage point also permitted viewing of the airspace to the south of the valley, which allowed an evaluation of

[1]Historical Irish Whooper Swan Study Group (IWWSG) data for the Keady lakes complex from 2009 indicates modest flocks arrive there by mid-October.

the use of the valley compared with the local wider countryside to be made. The times of any swan movements, the numbers of birds involved, direction of flight and height of flight were all recorded.

This vantage point work built on the information collected previously. It does not intend to contribute to a collision risk model and therefore it was not necessary to meet the minimum 36 hours threshold to create such a model. It will instead provide a thorough indication of how well-used the area is by whooper swans and associated species.

Element 3: Potential for whooper swans foraging in the Blackwater River valley to commute across the proposed overhead line route

The pattern of swan usage of the nearest traditional feeding sites to the proposed overhead line route over the winter were identified by visiting the well-known swan sites in the general vicinity of the Blackwater River valley.

Each site was visited during two survey periods in 2016 and will be visited again before February 2017. Counts were made of birds at traditional feeding sites, considered to contain birds which could possibly use the valley as a route between feeding and roosting sites, or alternatively that might commute between feeding and roosting sites located on opposite sides of the proposed line route.

These traditional sites were particularly focussed around the Blackwater River valley around Caledon and their associated cross-border sites in the Blackwater catchment in Co Monaghan.

Links were confirmed between individual sites by strategically positioning surveyors at feeding sites and possible roosting sites. 'Walkie-talkie' radios allowed communication between surveyors to establish exact moments that flocks departed feeding sites and the numbers contained within them. For some sites, an intermediate surveyor was positioned between the feeding and roosting site, to confirm that the flocks continued in a particular direction. Radio contact between surveyors confirmed arrival at the roosting site. In this way, the roosting sites were confirmed for every associated feeding site.

Element 4: Potential for whooper swans using the Keady lakes to cross the proposed overhead line route.

The potential for swan movements between traditional wintering sites at lakes in the vicinity of Keady were addressed by undertaking counts of swans using the lakes and observing their feeding/roosting behaviour.

Surveys were concentrated on the two hours immediately after daybreak and during the three hours immediately preceding last light. A half hour period was also spent in darkness (both before first light and after last light) to ensure no further bird movements were noted. Any flightlines and roosting behaviour were recorded at the Keady lakes during each survey visit. The sites were each surveyed twice, and will be surveyed again before February 2017.

Other wintering bird species

During all surveys, movements of other bird species upon which the overhead line might have an impact would be noted , for instance:

- Mute and Bewick's swans;
- Geese, herons, and cormorants;
- Large birds of prey (i.e. merlin and sparrowhawk excluded);

4. Results

Survey periods

The first two survey periods were carried out during October and November/December 2016 as shown in Table 1.

- Survey 1: 17 October - 21 October 2016
- Survey 2: 28 November - 1 December 2016

No whooper swans or other similar species were recorded in the first survey period at any of the sites. During the second survey period, remote from the overhead line route, five flocks and a further single swan were recorded.

Use of overhead line route by foraging whooper swans

A single whooper swan was recorded foraging at Clonbeg site which is approximately 1km from the proposed substation (28 November 2016). This solitary individual was observed feeding on the grassland fields by the River Blackwater. This individual was not observed to fly at any point during the dusk or dawn survey and therefore may have been roosting in that area.

No other foraging or roosting swans were identified within 500m of the overhead line route.

Use of Blackwater River valley as a commuting/migration route for whooper swans.

No whooper swans were observed using the Blackwater River valley as a commuting/migration route at the time of survey.

Anecdotal evidence from local residents at Aghavilly Road, observed a flock of approximately 20 whooper swans flying south towards Keady lakes. These birds were flying around noon on 30.11.16 and are likely to have been commuting south from Lough Neagh as surveyors did not record birds leaving the Annaghroe (RB06) or Enagh Lough (RB05) flocks at that time. These birds may have followed the Blackwater River Valley from Lough Neagh to approximately Blackwatertown before continuing south away from the river valley towards the Keady Lakes.

Potential for whooper swans foraging in the Blackwater River valley to commute across the proposed overhead line route.

No whooper swans were observed commuting between foraging sites and roosting sites across the proposed overhead line route, at the time of survey.

Potential for whooper swans using the Keady lakes to cross the proposed overhead line route.

On 01 December 2016 whooper swans were recorded at Clay lake (7 individuals), Gentle Owens Lake (3 individuals) and Darkley reservoir (30 individuals). At all these locations, movement of birds was minimal with birds commuting short distances between feeding areas on immediately adjacent fields and roosting and loafing on the water. Birds often walked the short distance rather than flying.

Whooper swans occurring at known traditional locations and other places

During the 2016 surveys, five separate flocks of whooper swans and a single whooper swan were observed and recorded, occurring in known whooper swan locations. The results are shown in Table 1 and the locations are presented in Figure 1. For each of these flocks, using strategically positioned surveyors, it was possible to confirm where each was roosting (Figure 1).

Other wintering bird species

Approximately 50 Greenland white-fronted geese and 20 greylag geese were recorded at Annaghroe (RB06) on 30 November 2016. These birds either commuted during darkness or remained at the site to both roost and feed. No commuting flight was observed during daylight hours.

Resident mute swans were identified at the majority of ponds and lakes throughout the study area. Numbers were largely restricted to family groups, with a breeding pair and juveniles from the previous breeding season also observed.

Other large resident birds such as heron, little egret, cormorant and buzzard were recorded at numerous locations.

Table 1. Survey timetable with results

Location reference \ Date	17 Oct	18 Oct	19 Oct	20 Oct	21 Oct	28 Nov	29 Nov	30 Nov	01 Dec
Clonbeg	0				0	1 F/R			
N70	0	0				0			
N71	0	0				0			
TY01 (Creeve Lough)	0	0					0		
TY02 (Legane Lough)	0	0					0		
TY03 (Bantry Lough)	0	0					35R		
RB01	0				0	0			
RB02		0	0				35F		
RB03		0	0					0	
RB05 (Caledon)		0	0					0	
RB06 (Annaghroe)		0	0					33F	
Emy Lough								40R	
Ballmacally			0					0	
Clay lake			0	0					7F/R
Gentle Owens Lake			0	0					3 F/R
Tullynawood Lake			0	0					0
Darkley reservoir			0	0					30F/R

Note: Records are of whooper swan, F=feeding, R=roosting. Since feeding and roosting birds are not mutually exclusive, columns cannot be added to produce totals for sites or for the study area.

5. Discussion

No whooper swans were recorded at all during the October visit, highlighting that the area is not important for the species during this early winter period, especially during dry conditions.

Use of overhead line route by foraging whooper swans

Fields at Clonbeg are generally only used when inundated with floodwater (Robinson *et al*, 2004) which permits the birds to feed and roost at the same locality. However, the fields were dry at the times of survey and only a single individual whooper swan was identified at this location on 28 November 2016. AECOM's previous surveys (2006-2011) identified nine birds here on 05 December 2006, and 19 on 29 January 2009. This site is relatively far from any area of permanent standing water, with Lough Neagh approximately 9.5km and water bodies around Dungannon (Eskragh Lough, Dungannon Park, Ballysaggart Lough) 8km away.

As no birds were recorded in the corridor along the overhead line route, it further affirms this as an area rarely used by whooper swans.

Traditional feeding grounds of whooper swans are well known, and any sites outwith these that are used by whooper swans are likely to be used for short periods of time only. Use of non-traditional sites may result from random events, such as adverse weather conditions encountered during migration, or ephemeral floods, which could occur almost anywhere.

Use of Blackwater River valley as a commuting/migration route for whooper swans.

No whooper swans were observed to cross or fly near the overhead line route for commuting/migrating during the 2016 survey periods to date. The only sighting of swans remains from a single occasion in 2006.

This part of the valley would still therefore appear to be of low importance for swan navigation between roosts and feeding sites, or as a migration route with birds moving to their wintering sites from staging sites to the north (Lough Neagh). The overall absence of records may reflect a possible radial dispersion of birds from Lough Neagh, the major roost/staging site in the area, resulting in generally north to south movements, that is sub-parallel with the proposed overhead line route in the vicinity of the river crossing.

Potential for whooper swans foraging in the Blackwater River valley to commute across the proposed overhead line route.

No swans feeding in the Blackwater Valley were observed commuting across the proposed overhead line route.

Swans foraging around the Blackwater River Valley round Caledon (RB02) and Annaghroe (RB05) were observed commuting short distances to roosting sites at Bantry Lough (TY03) 4.6km northwest and Emy Lough 4.4km to the west. This is consistent with similar movement observed in March 2009, although swans then commuted short distances between Caledon (RB05) and Enagh Lough (1km away). All these commuting routes occur over 5km away from the proposed overhead line route. A single whooper swan was recorded at Clonbeg on 28 November 2016, at the time of survey this bird was considered to be resident at this location with no commuting route identified.

Potential for whooper swans using the Keady lakes to cross the proposed overhead line route.

The whooper swans using the Keady lakes were not observed crossing the proposed overhead line route. During winter 2016 surveys, whooper swans at the Keady Lakes were relatively sedentary with only short commutes between roosting lakes and feeding sites on adjacent surrounding fields, either by flight or on foot. Previous observations have shown that swans commute between several of the lakes in the Keady area, and birds using the area appear to be site-resident over prolonged periods.

The anecdotal evidence of birds flying south over Aghavilly Road would suggest flight lines between Lough Neagh and Keady Lakes are to the east of the proposed overhead line, and there is unlikely to be a conflict between the overhead line alignment and swans in this area.

Other wintering bird species

The Greenland white-fronted geese and greylag geese at Annaghroe (RB06) were thought to be relatively sedentary with no evidence of any regular movement of birds across the overhead line route during winter 2016 surveys.

Previous records and anecdotal evidence from locals have suggested a westward movement of these birds towards Slieve Beagh, these movements would not therefore bring birds into the immediate vicinity of the proposed overhead line.

Mute swans are strongly territorial with numbers restricted to small family groups on individual lakes. As such there would be minimal movement of these birds across the route line. Some birds stay in their territories all year, while others move short distances and form winter flocks, particularly during cold weather. Mute swans in the area are only likely to move locally if their resident ponds/lakes freeze over.

6. Conclusion

The interim results from the 2016 update surveys further affirm the conclusions of the existing body of work in relation to the wintering birds in the study area.

During 2016, five individual flocks of whooper swans and a single swan were recorded and, for each, their feeding and roosting locations were established to be remote from the proposed development.

None of the flightlines between feeding and roosting sites recorded during this study crossed the proposed overhead line route, and birds that winter in the Blackwater River valley will not be at risk of collision during regular movements between these sites. Birds that winter at the Keady lakes were again found to roost at the lakes, and therefore there is unlikely to be a collision risk for these birds while they are in residence at the lakes.

There is currently no evidence of the routes that swans use when entering or leaving the wintering areas, but movements may take place between Lough Neagh and the study area. Movements between staging posts to the north (e.g. Lough Neagh) and sites at Clonbeg and the Keady lakes are unlikely to be affected by a significant collision risk, due to the alignment of the proposed development with respect to flight direction to and from staging sites.

No further evidence was collected during the 2016 surveys to alter the conclusions drawn during the consolidated ES and its addendum. It remains that there is unlikely to be a significant risk of collision arising from the proposed development at the individual level, and any risks are likely to be largely limited to arrival and departure from the Blackwater River valley at the beginning and end of the winter period. Any collisions that may occur will not have a significant impact at the local or national population level.

7. References

Robinson, JA, K Colhoun, JG McElwaine and 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.

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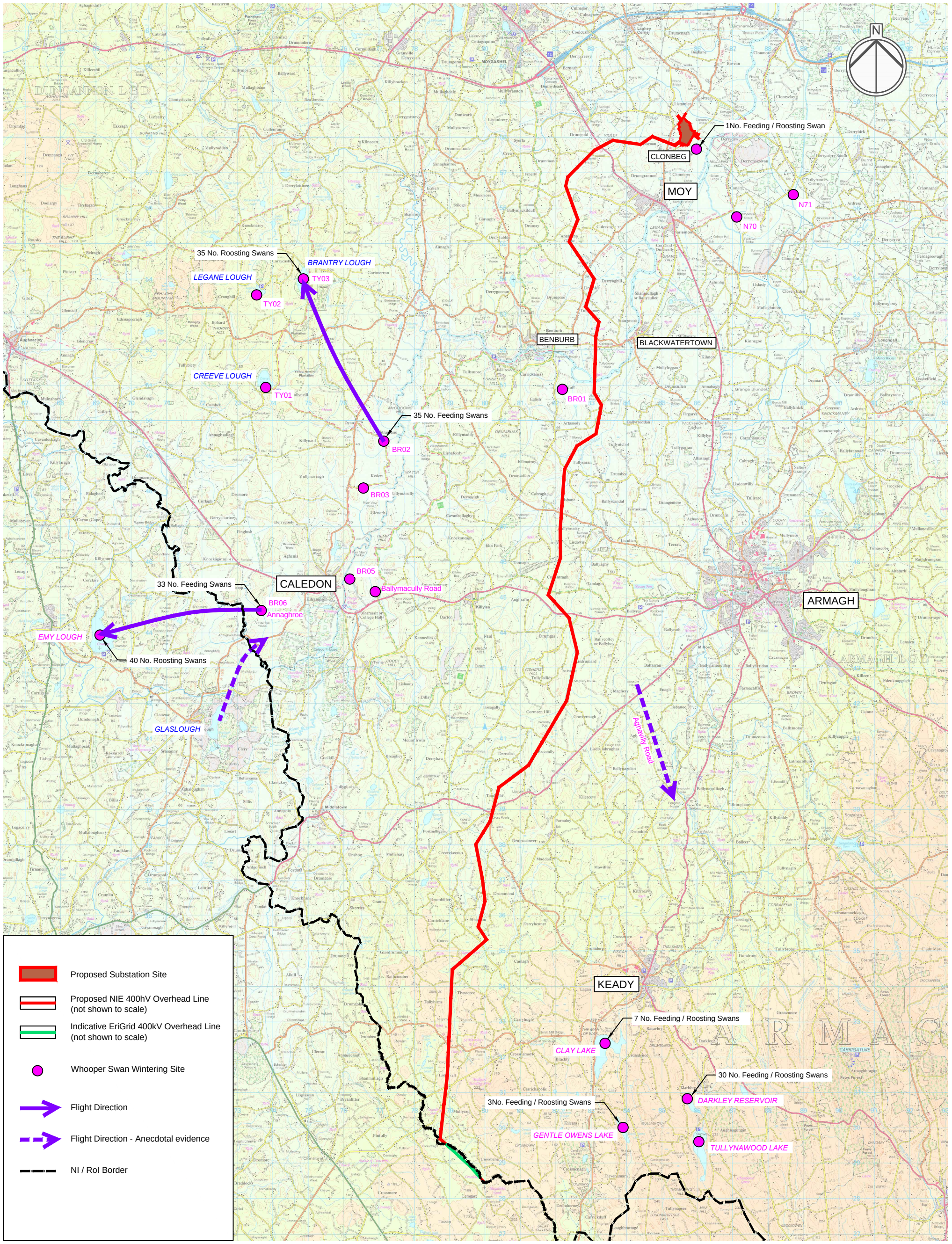

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