

Cavan to Tyrone 400kV overhead Powerline Project

Distribution of Whooper Swan Feeding and Roosting Sites

December 2008

TOBIN CONSULTING ENGINEERS



REPORT

PROJECT:

Cavan to Tyrone 400kV overhead powerline project

Distribution of Whooper Swan feeding and roosting sites

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1 EXECUTIVE SUMMARY

Field studies were undertaken over two winter seasons including between November 2007 and March 2008 inclusive, referred to from here on is as Wintering Survey Period 1 and between November 2008 and December 2008 inclusive referred to from here on is as Wintering Survey Period 2.

The aim of this study was to determine the numbers and distribution of Whooper Swans within a study area that includes the route corridor options for the proposed Cavan to Tyrone 400kV overhead powerline. This study is ongoing to coincide with the season when Whooper Swans are present in Ireland and will continue until April 2009 which forms part of Wintering Survey Period 2.

Findings and consequently assessment of impacts and mitigation have not therefore been finalised.

The study area lies within Counties Cavan and Monaghan.

A desktop study showed that Whooper Swans have been recorded at a number of sites within the study area, chiefly in the western section of the survey area. The study area appears to lie at the eastern edge of a complex of lake sites including the Dromore River utilised by wintering Whooper Swan.

Field studies aimed to identify feeding sites, roosting sites and any flightlines between feeding and roosting sites.

The sites in the study area are mainly centred on small, permanent water bodies with adjacent open improved grassland. These sites offer habitats for both feeding and roosting and therefore there is no requirement for the Whooper Swan to commute extensively between separate roosting and feeding sites except possibly at Ballintra although this has not been confirmed despite ongoing dawn and dusk checks. In total 21 sites have held Whooper Swans in the past or were detected as new sites during this study.

During the course of the study, Whooper Swans have been recorded at 13 of these sites with Loughs Namachree, Creeve, Lisnakkillewbane, Laragh, Egish, Derryloobinagh and Ballintra containing Whooper Swans on two or more occasions, i.e. relatively regular sites.

Localised flightlines were detected at Tonyscallon Lough and on Lough Creeve, highlighting that Whooper Swan's move on occasion at least short distances between feeding and roosting sites. Flightlines noted were localised short distant movements rather than significant daily flightlines.

Newly released figures for the population estimates of wintering waterbirds in Ireland give a wintering population of Whooper Swans of approximately 12,730. Any site holding 1% of this population (ie 127 Whooper Swans) is considered to be of national importance.

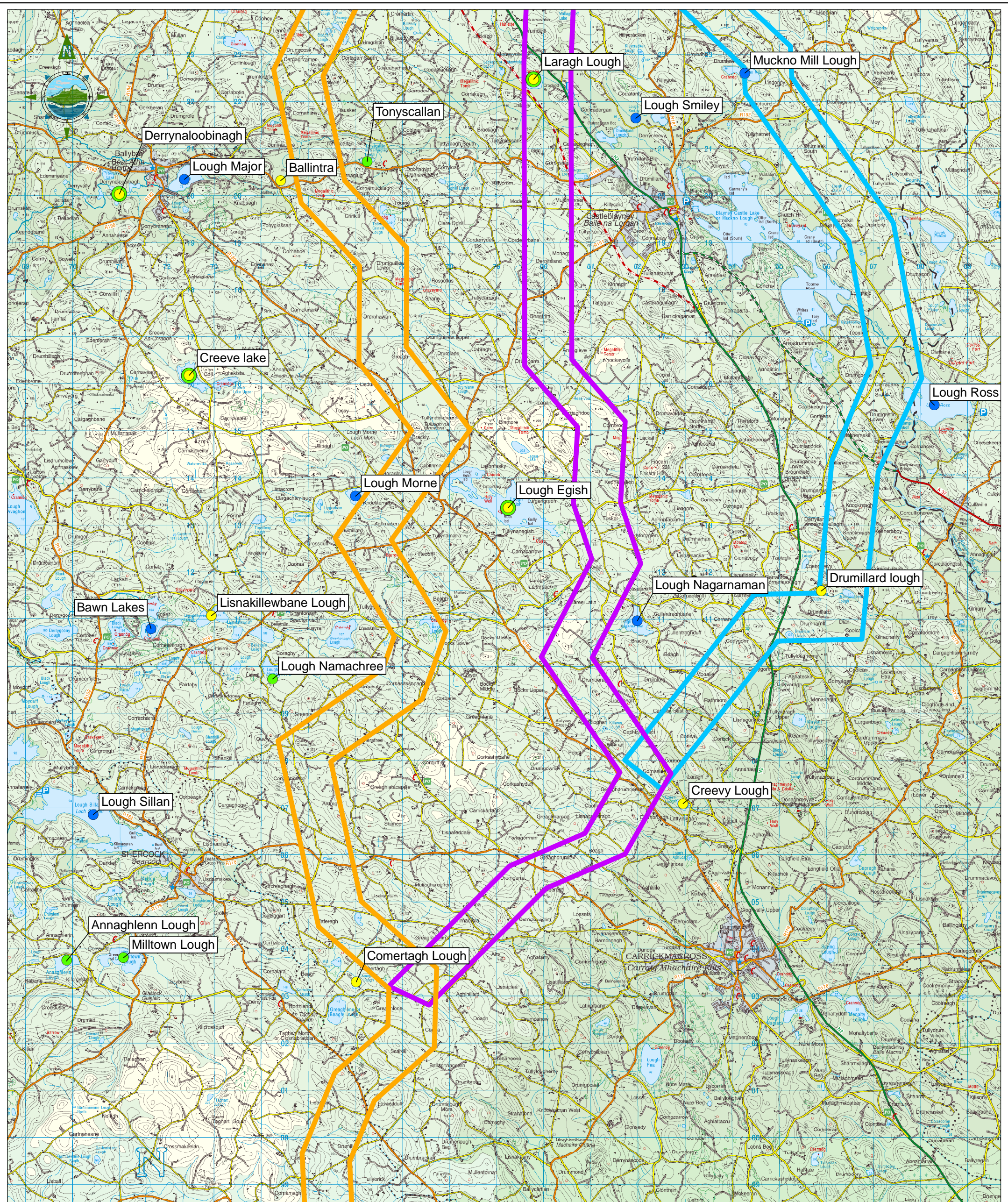
Lough Major has been known to have nationally significant numbers (up to 135) though nothing close to these numbers has been recorded during this study.

The maximum number of Whooper Swans recorded within the entire study area on any one occasion was 98 (see Table 4.2), which does not exceed the nationally important figure. None of the sites found within the study area contained nationally important numbers with the highest recorded number of Whooper Swans at any one site being 49 at Lough Namachree (December 2008).

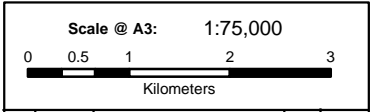
Potential impacts on sites used by Whooper Swans may exist at Laragh Lough where up to 21 have been recorded within the route corridor option B. Other sites close to this route corridor option include Creevy Lough (route B) and Drumillard Lough (route C). A new site detected in December 2008 at Tonyscallon Lough (close to route corridor option A) may potentially be a roost area for Whooper Swans which use Ballintra (noted Wintering Survey Period 1) though no Whooper Swans have been noted at Ballintra during Wintering Survey Period 2. A flightline was detected (December 2008) between Tonyscallon Lough and Tooncrinkill Lough which may cross/ come close to crossing route corridor option A.

Wintering Survey Period 2 will be ongoing until at least April 2009 to provide further information on flight lines between roost and feeding areas. This survey work will aim to determine the roost site for the Whooper Swans that feed at Ballintra and if significant local movements occur at Loughs Namachree, Egish, Creevy, Laragh and Drumillard, or mentioned lakes close to the selected route corridor options. Mitigation measures will be proposed for determined flightlines or areas requiring precautionary line marking based on probable/ confirmed local movements.

In addition appropriate mitigation measures based on best practice with regard to minimising/ avoiding potential conflicts with Whooper Swans will be reviewed and recommended for inclusion in the final design process. Such best practice includes routing powerlines as low as possible between drumlins and along hedgerows and parallel rather than across flight lines where possible.



- Route Corridor Option A
- Route Corridor Option B
- Route Corridor Option C
- Swan sites recorded in Winter Survey Period 1: 2007/08
- Swan sites recorded in Winter Survey Period 2: 2008/2009 (not concluded)
- Swan sites recorded in both Winter Survey Periods 1 and 2
- Potential significant Wintering Bird Sites



B	15-12-08	Issued for Review	A.G.	M.H.
A	25-07-08	Issued for Review	A.G.	M.H.
Issue	Date	Description	By	Chkd.

NOTES

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
- BUILDING LOCATIONS SOURCED FROM GEDIRECTORY
- DISTANCES ARE FROM OUTER EXTREMITY OF PYLON



Project:
KINGSCOURT TO CLONTIBERT
400kV OVERHEAD LINE ROUTES

Title:
WHOPPER SWAN DISTRIBUTION
ROUTE CORRIDOR
OPTIONS

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4416 Figure 1 Issue: B

2 INTRODUCTION

TOBIN Consulting Engineers have been retained to undertake a study into the distribution of Whooper Swans (*Cygnus cygnus*) within the study area for proposed route corridor options for the Cavan to Tyrone 400kV overhead powerline project. This report has been commissioned by AOS Planning as part of the Environmental Impact Statement (EIS) for the proposed development. A general ecology section is being prepared for the EIS, but this report is a specific detailed report on Whooper Swans.

The overhead powerline project will provide a new powerline linking a new substation in the vicinity of Kingscourt County Cavan to a border crossing point northeast of Clontibret Co. Monaghan. Three main route corridor options have been devised for this powerline; options A, B and C.

A constraints study was undertaken for this project by AOS Planning. Consultation was carried out with the National Parks and Wildlife Service (NPWS) for the constraints study. NPWS requested that consideration be given to “*mitigating measures to lessen any likely collisions from wildfowl, in particular Whooper Swans, in the area between Loughs Muckno, Lough Egish and Black/Derrygooney/Bawn Loughs*”. This study was commissioned, in part, as a response to this request from NPWS.

Whooper Swans are listed under Annex I of the EU Birds Directive (EU 79/409/EEC). EU Member states are required to maintain populations of rare and migratory bird species that are listed under Annex I by establishing designated areas – Special Protection Areas (SPA) - for the conservation of these species. Whooper Swans are further protected as they are listed under Annex II of the Berne Convention on the conservation of wildlife and natural habitats (commonly known as the Berne Convention), they are also amber listed in ‘Birds of Conservation Concern in Ireland’ (Newton *et al.*, 1999 and Lynas *et al.*, 2007) as the numbers of Whooper Swan that winter in Ireland are internationally important.

Whooper Swans are winter migrants to Ireland; generally arriving in October and leaving to return to their breeding grounds in late March/early April. The Whooper Swans that winter in Ireland breed in Iceland. This entire period was/will be included in this study.

Wintering Whooper Swans are found mostly on lowland open farmland around inland wetlands and are regularly seen while feeding on grasslands and stubble. Whooper Swans usually feed during the daylight hours and leave the feeding sites at dusk to congregate at evening roosts (Owen *et al.* 1986 in Robinson *et al.*, 2004).

This study has been undertaken over two wintering periods to date. Wintering Survey Period 1 was undertaken monthly from early December 2007 to March 2008 and Wintering Survey Period 2 started in early November 2008 to December 2008. This current period of the study is ongoing and will continue to April 2009.

The overall study seeks to determine Whooper Swan distribution within the study area and whether any regularly used flightlines between feeding and roosting sites cross any of the proposed route corridor options and to identify potential impacts of the proposed powerline on Whooper Swans.

3 METHODOLOGY

This study comprised desktop and field study elements, with the results from the desktop work identifying the areas for fieldwork. The study area for this project covered all of the chosen route corridor options.

3.1 DESKTOP STUDY

3.1.1 Literature search

A literature search was undertaken to determine the locations of any known feeding or roosting sites used by Whooper Swans within the study area. The full list of source materials is given below. This list, together with comments on the information on Whooper Swan sites is in Appendix 1:

- McElwaine JG, Wells JH and Bowler, JM 1995. Winter movements of Whooper Swans visiting Ireland: preliminary results. Irish Birds Vol 5 (3) pp 265-278
- Colhoun K, McElwaine JG, Cranswick PA, Enlander I & Merne OJ 2000. Numbers and distribution of whooper *Cygnus cygnus* and Bewick's *C. columbianus bewickii* Swans in Ireland: results of the International Swan Census, January 2000. Irish Birds Vol 6 (4) pp485-494
- Crowe O & Boland H, 2004. Irish Wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2001/02. Irish Birds Vol 7 (3) pp313-326
- 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 Vol 7 (4) pp483-488
- Crowe O & Boland H, 2005 Results of Waterbird Monitoring in Ireland in 2002/03. Irish Birds Vol 7 (4) pp529-538
- Crowe O & Boland H, 2006. Irish Wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2003/04 & 2004/05. Irish Birds Vol 8 (1) pp21-34
- Crowe O, 2005 Ireland's Wetlands and their Waterbirds: Status and Distribution. BirdWatch Ireland

- 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.

- Lovatt, JK. 2006 Birds in County Cavan. Birdwatch Ireland

A list of known sites with grid references was then compiled and plotted against the route corridor options. Sites lying within the area bounded by the route corridor options and sites lying within 5km to the west of route corridor option A or to the east of route corridor option C were selected as sites that should be included in the field studies. For completeness all lake sites within this study area were inspected.

3.1.2 Consultation

Consultation letters were sent to BirdWatch Ireland and the Irish Whooper Swan Study Group. AOS Planning had previously consulted NPWS as part of the constraints study.

TOBIN Consulting Engineers staff have viewed public submissions and attended various stakeholder consultation meetings arranged by EirGrid for this project. Information relating to Whooper Swans and some wintering bird sites were obtained from these submissions and meetings. This was further investigated by TOBIN Consulting Engineers through desk-top and field visits to assess Whooper Swan populations at suggested sites.

3.2 FIELD STUDY

There were two aims for the fieldwork:

1. To locate Whooper Swan feeding sites within the study area and to record numbers of Whooper Swan using these areas
2. To determine if any flightlines between feeding and roosting sites cross any of the route corridor options.

3.2.1 *Location of feeding sites*

The results of the literature search and consultation produced a list of sites that have previously held Whooper Swans.

Sites were checked once a month during daylight hours during Wintering Survey Period 1, with the final field visit taken place on the 11th March 2008. All sites were scanned using binoculars and telescopes where appropriate from vantage points on public roads. Likely habitats close to these sites were also checked as were areas deemed suitable for Whooper Swans that were seen whilst driving between sites.

Records were taken of numbers of Whooper Swans (adults and first winter birds), numbers of other bird species associated with the Whooper Swan flocks, weather conditions and habitat type.

3.2.2 *Determination of flightlines*

Dawn and dusk watches were conducted at Lough Egish and Lough Morne during Wintering Survey Period 1. These two sites lay either side of route corridor option A. This route corridor option had emerged from the constraints study as the most favourable route option. Any flightline that may exist across the route corridor option appeared most likely to occur between these two sites.

Ballintra was checked also in Wintering Survey Period 2, as this area was determined to be the most likely area to contain a flightline during Wintering Survey Period 1.

Further dawn and dusk studies will be carried out in Lough Namachree area during the rest of the Wintering Survey Period 2 as Whooper Swans were first noted in this area during late winter 2008.

No known specific roost site has been identified within the study area during the literature search. Therefore, the focus of these studies is on known feeding concentrations of Whooper Swan to determine if they are crossing the route corridor option.

Dawn watches commenced half an hour before sunrise and continued for a further hour. Similarly, dusk watches started half an hour before sunset and continued for a further hour.

4 RESULTS

4.1 DESKTOP STUDY

The literature search and consultation exercise identified 13 separate localities where Whooper Swans have been recorded in the past. Table 4.1 below lists these areas together with a grid reference, details of numbers of Whooper Swans recorded in the past (where available) and comments. Some of these localities were given as discrete sites (and so have six figure grid references), whereas others refer to areas and only have four figure grid references.

Table 4-1 List of localities where Whooper Swans have been previously recorded

Site Name	Grid Reference	Available count numbers	Comments
Cavan			
Bawn Lakes	H7110	20-40	NPWS mention
Creeve lake	H7216	16	
Lough Sillan	H700066	20	
Milltown Lough	H710039	16	
Monaghan			
Lough Major	H7220	135	Nationally important numbers
Lough Ross	H8816	20	
Creevy Lough	H830070	10	
Lough Egish	H7913	22	NPWS mention
Laragh Lough	H7922	43	NPWS mention
Lough Morne	H7613	7	
Lough Nagarnaman	H820110	13	
Muckno Mill Lough	H8422	41	
Lough Smiley	H8222	5	

Figure 1 shows the location of these sites in relation to all route corridor options.

The literature search showed that the study area lies at the eastern edge of an area that has a considerable number of sites where Whooper Swans have been recorded in the past. Most of these sites are associated with the numerous lakes and the Dromore River that lie to the west of Ballybay and Sherlock and are outside the study area.

4.2 FIELD STUDY

4.2.1 Feeding Sites

Refer to Figure 1 for the location of the feeding sites surveyed. The surveys were conducted on the following dates:

Wintering Survey Period 1

- 6th December 2007
- 8th January 2008
- 6th February 2008
- 11th March 2008

Wintering Survey Period 2

- 5th November 2008
- 3rd December 2008

All of the counts were undertaken in suitable weather conditions with good visibility. All of the identified sites that lie within the study area were counted each month. Eight new sites where Whooper Swans were present were found during the course of the study to date.

These new sites include:

- Lisnakillewbane Lough
- Ballintra
- Derrynaloobinagh
- Comertagh Lough
- Drumillard Lough
- Lough Namachree
- Lough Tonyscallon
- Annaghleinn Lough

These sites were checked on subsequent counts. A total of 21 sites were checked where Whooper Swans currently use, or have used in the past. In addition other lakes and possible sites were checked during survey. The results of the surveys are outlined in Table 4.2 overleaf.

Table 4-2 Numbers of Whooper Swans Recorded

Site Name	Grid Reference	06/12/2007	08/01/2008	06/02/2008	11/03/2008	5/11/08	03/12/08
		Wintering Survey Period 1				Wintering Survey Period 2	
Cavan							
Lough Sillan	H700066	0	0	0	0	0	0
Milltown Lough	H710039	0	0	0	0	5	0
Monaghan							
Lough Major	H7220	0	0	0	0	0	0
Ballintra	H745203	11	0	14	23	0	0
Derrynalooabinagh	H705200	31	0	0	0	7	0
Comertagh Lough	H761033	10	7	0	0	0	0
Lough Ross	H8816	0	0	0	0	0	0
Creevy Lough	H830070	3	0	9	8	0	0
Lough Egish	H7913	0	0	0	2	7*	0**
Laragh Lough	H7922	16	26	0	3	0	21
Lough Morne	H7613	0	0	0	0	0	0
Lough Nagarnaman	H820110	0	0	0	0	0	0
Drumillard lough	H858117	0	2	0	0	0	0
Muckno Mill Lough	H8422	0	0	0	0	0	0
Lough Smiley	H8222	0	0	0	0	0	0
Bawn Lakes	H7110	0	0	0	0	0	0
Lisnakillewbane Lough	H727112	0	0	22	36	0	0
Creeve Lough	H7216	25	21	17	12	4	11
Lough Namachree	H745099	0	0	0	0	26	49
Lough Tonyscallon	H763207	0	0	0	0	0	17
Annaghleinn Lough	H699038	0	0	0	0	2	0
Min Count Study Area		96	56	62	84	37	98

* 30 mute swan

** 32 mute swan

Only one site held Whooper Swans on all six separate occasions, Creeve Lough. Numbers of Whooper Swan average 15 at this location. Whooper Swan were noted predominantly feeding on improved grassland at the edge of the lake or feeding/ loafing on the lake. A short flightline was detected here from the north west on to the lake.

Laragh Lough held Whooper Swans on four occasions (max 26) with all Whooper Swans consistently noted on the lake.

Ballintra, and Creevy Lough held Whooper Swans on three occasions though neither site have held Whooper Swans so far in Wintering Survey Period 2.

Lough Egish, Derryloobinagh held Whooper Swans on two occasions. During the Wintering Survey Period 2 it has been noted that Lough Egish holds relatively large numbers of mute swan (30+).

Drumillard Lough only held Whooper Swans on one occasion.

A significant new site with a large wintering flock (max 49 to date) of Whooper Swans was determined during Wintering Survey Period 2, at Lough Namachree. Whooper Swans have been noted here, at the same location in Wintering Survey Period 2.

Two other new sites determined during Wintering Survey Period 2 are; Annaghlenn Lough which was used by small numbers (2) of Whooper Swan in November 2008; and Tonyscallon Lough and adjacent fields were also confirmed on one date (December 2008). This area was being used for roosting and foraging by 17 Whooper Swans. In addition a flight line was detected close by Tonyscallon Lough (see section 4.2.2).

No Whooper Swans have been noted during either Wintering Survey Periods 1 or 2 on Lough Major which has held nationally significant numbers in the past. In addition no Whooper Swans were recorded at nine of the sites highlighted in the desk review or other lakes checked within the study area.

4.2.2 Roosting sites and Flightlines

No Whooper Swans were recorded during the dawn and dusk watches at either Lough Egish or Lough Morne with no waterfowl, including mute swans, seen to cross the proposed route corridor option.

No flightlines were detected at Ballintra to date though a flight line was detected close by at Tonyscallon Lough close to Ballintra, during December 2008, when five Whooper Swans flew in from Tooncrinkill Lough, to the south of this location.

5 DISCUSSION

Wintering Survey Period 2 is ongoing to at least April 2009 and therefore points further discussed are not conclusive.

The vast majority of sites where Whooper Swans were recorded consisted of permanent water bodies (small lakes), frequently with adjacent fields of improved grassland. The Whooper Swans were either recorded on the water or feeding on improved grassland. Sites noted are used as both feeding and roosting sites. The adjacent grassland provides feeding habitat whilst the water bodies provide safe roost areas for the night. The implication of this is that once the Whooper Swans arrive on site, they do not fly to local roost sites on a daily basis and there are no regularly used flightlines. The Whooper Swans may stay at a site for a short period of time before migrating elsewhere but appear not to commute between roosting and feeding sites at least on a daily basis over the course of the winter.

Rees *et al* (1997) found that Whooper Swans do generally choose sites with permanent water. The exception to this is the site at Ballintra. Here the Whooper Swans were found on some low lying fields adjacent to a small watercourse and field ditches with no permanent water body present. The nearest water bodies to this site are Loughs Tonyscallon and Lough Major. During Wintering Survey Period 1, Whooper Swans were detected at Ballintra (none during Wintering Survey Period 2 yet); it was not confirmed whether the Whooper Swans that feed at Ballintra roost on either of these lakes. Tonyscallon Lough was used by Whooper Swans in December 2008 and a flightline from the south was detected. Further survey work during Wintering Survey Period 2 will aim to determine if these Whooper Swans move to Ballintra which would cross route corridor option A.

Relatively significant numbers of Whooper Swan have been noted this year (November and December) at Lough Namachree (max 49) which is close to route corridor option A (approximately 1km to the east). Whooper Swans here are feeding in adjacent improved grassland and roost on the lake. Therefore no significant flightline is likely over route corridor option A located approximately 1km to the east of this. This will be further confirmed during the remainder of the study as line marking may potentially be required in this area, at least as a precaution.

The recently published figures for numbers of waterbirds wintering in Ireland (Crowe *et al*, 2008), shows that the wintering population of Whooper Swans in Ireland is approximately 12,730. Any site that regularly holds 1% of this figure (c.a. 127 Whooper Swans) is considered to be of national importance for Whooper Swans. None of the sites within the study area held nationally important numbers. In fact, the total numbers of Whooper Swans recorded in the study area did not exceed this figure, with the highest total number of Whooper Swans recorded being 98.

As stated previously, the study area lies at the eastern end of a complex of small lakes and sites including the Dromore River. The major sites for Whooper Swans in Cavan and Monaghan lie further to the west with important sites at Lough Oughter and the Annalee River (Cavan) and Drum lakes

(Monaghan) (Robinson *et al*, 2004). These major sites would attract Whooper Swans into the western part of these counties, away from the study area. Furthermore, both Cavan and Monaghan have a high density of inter drumlin lakes often with adjacent grasslands providing an abundance of alternative sites for Whooper Swans leading to a dispersed wintering population.

The study to date confirms that small flocks of Whooper Swan are widely dispersed in the study area feeding and roosting within relatively localised areas. Within this study area a number of clusters are beginning to emerge which are locally important for at least small flocks of Whooper Swans.

These areas include:

- Lough Creeve;
- Lough Laragh;
- Lough Namachree;
- Ballintra area (probably including Lough Tonyscallon and Tooncrinkill); and
- Possibly Lough Derryloobinagh.

Other lakes appear relatively unimportant based on surveys completed to date. These are lakes where Whooper Swans have been less regularly detected or not at all, and generally in smaller numbers (typically individual family groups).

6 POTENTIAL IMPACTS

No Whooper Swan flightlines were recorded crossing any of the route corridor options to date.

Laragh Lough and Drumillard Lough where Whooper Swans have been detected lie within route corridors options B and C respectively. Given the proximity of these route corridors to regular flocks at Laragh Lough and small numbers (2) at Drumillard Lough; these route corridor options (B and C) may potentially lead to at least minor risks to small numbers of Whooper Swan here.

Ballintra, Namachree and Comertagh Lough lie approximately 1km west of route corridor option A. The Whooper Swans that feed at Ballintra are likely to roost at Loughs Major or Tonyscallon, the nearest significant water bodies. Whooper Swans have not yet been recorded at Ballintra during Wintering Survey Period 2 and no flightline has been detected here to date. A flightline has been detected between Loughs Tonyscallon and Tooncrinkill Lough which are close to route corridor option A. Further monitoring work will be undertaken this season to confirm if regular flight lines exist at Ballintra and other potential lake roosts described close by.

Whooper Swans at Lough Namachree appear to utilise a specific area for foraging with the lake roost site close by; it is unlikely that these Whooper Swans fly across route corridor option A regularly. Ongoing monitoring will be implemented to record these Whooper Swans daily movements.

The four sites that were used regularly during the study period to date are Ballintra, Creeve Lough Namachree Lough and Laragh Lough. As previously mentioned, Ballintra lies close to route corridor option A but no Whooper Swans have been noted crossing this route to date. A flightline confirmed close by at Tonyscallon Lough suggests that it is likely that line marking and careful location of pylons will be required in this area, at least as a precaution. Further studies here will aim to build up information on bird movements in this area. Creeve Lough lies some 5km to the west of route option A and movements appear to be localised between feeding and roosting areas on and adjacent to the lake hence impacts are unlikely.

To date it appears that it is unlikely that there will be significant impacts on the wintering Whooper Swans within the study area arising from any of the route corridor options.

Ongoing survey works will proceed to build up knowledge of Whooper Swan distribution and movements in this area and thus gain as much information as is feasible to determine areas with a potential collision or displacement issue for Whooper Swans from the powerline. Precautionary line marking may be recommended in some areas following this study specifically close to; Laragh Lough, Ballintra, Creevy Lough, Drumillard Lough and Lough Namachree; depending on the route corridor option selected. Further mitigation measures based on recommended guidelines for minimising impacts to Whooper Swans will be researched and incorporated into the design stage for the finalised powerline location.

Whooper Swans potentially fly over the study area and over the route corridor options as they migrate from north to south at the beginning of the winter and south to north on the return migration, but they will be flying at a height that will be much greater than the powerlines. Additionally the general north-south orientation of the powerline routes run in parallel to the general migration routes of the Whooper Swans, further reducing any risk of collision with the powerlines. Haas *et al*, 2005 noted that birds are at greater risk of collision when powerlines cut across their migration corridors.

Further survey is ongoing and will continue to April 2009. This will allow a more accurate determination of Whooper Swan distribution and flightlines, therefore a more accurate impact assessment and recommendations as to final powerline location and mitigation measures.

7 RECOMMENDATIONS

Further Whooper Swan studies are ongoing to at least April 2009 within the entire survey area. Specific aims include determining where the Whooper Swans that feed at Ballintra go to roost, if Ballintra will be used this year, and if regular flightlines exist in the Lough Tonyscallon and Ballintra area. If there is a confirmed or probable flightline between the feeding and roosting sites in this area, then mitigation measures in the form of marking the lines may be required.

Based on the surveys to date undertaken over the Wintering Survey Period 1, and Wintering Survey Period 2, it is predicted that impacts are unlikely to any of the sites where Whooper Swans were recorded. However, further monitoring of flightlines and Whooper Swan distribution throughout the survey area and more specifically in the Ballintra and Lough Namachree areas is required. Even without significant new information, mitigation measures in the form of line marking may be recommended as a precautionary measure at certain specific locations including these described.

Haas *et al* also provide some general principles for protecting birds from collision with powerlines (Haas *et al*, 2005). These include:

- “Hiding” of powerlines: above ground powerlines should be routed as low as possible; behind buildings or rows of trees, at the foot of hills or mountains.

These general principles will be considered during the final stages of deciding the exact route of the powerline and placement of the pylons. In addition a literature review will be conducted to determine recommended markers and actions regarding the final location of powerlines, which minimise impacts as far as possible to Whooper Swans.

8 REFERENCES

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- 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.

APPENDIX 1

List of References Consulted during the Literature Review

- McElwaine JG, Wells JH and Bowler, JM 1995. **Winter movements of Whooper Swans visiting Ireland: preliminary results.** Irish Birds Vol 5 (3) pp 265-278
 - No details on sites

- Colhoun K, McElwaine JG, Cranswick PA, Enlander I & Merne OJ 2000. **Numbers and distribution of Whooper *Cygnus cygnus* and Bewick's *C. columbianus bewicki* Swans in Ireland: results of the International Swan Census, January 2000.** Irish Birds Vol 6 (4) pp485-494
 - Irish wintering population of Whooper Swan is 12,730 further establishing Irish importance for Icelandic population. Cavan population; 26 flocks totalling 874 Whooper Swans. Lough Oughter holds 338 Whooper Swans (internationally important), Ballinamore Lakes has 170 and Annalee River 141 (both nationally important). Monaghan has 19 flocks totalling 385 Whooper Swans.

- Crowe O & Boland H, 2004. **Irish wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2001/02.** Irish Birds Vol 7 (3) pp313-326
 - Max number of Whooper Swans counted on IWeBS was 3,297.

- Crowe O, McElwaine JG, Worden J, Watson GA, Walsh A & Boland H 2005. **Whooper *Cygnus cygnus* and Bewick's *C. columbianus bewicki* Swans in Ireland: Results of the International Swan census, January 2005.** Irish Birds Vol 7 (4) pp483-488
 - Irish wintering population of Whooper Swan is 14,079. Cavan population; 34 flocks totalling 836 Whooper Swans, Lough Oughter held 272 Whooper Swans. Monaghan has 12 flocks totalling 357 Whooper Swans.

- Crowe O & Boland H, 2005 **Results of Waterbird Monitoring in Ireland in 2002/03.** Irish Birds Vol 7 (4) pp529-538
 - Max number of Whooper Swans counted on IWeBS was 4,390.

- Crowe O & Boland H, 2006. **Irish Wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2003/04 & 2004/05.** Irish Birds Vol 8 (1) pp21-34
 - Max number of Whooper Swans counted on IWeBS in 2003/04 was 4,135 and 5,468 in 2004/05.

- Crowe O, 2005 **Ireland's Wetlands and their Waterbirds: Status and Distribution.** Birdwatch Ireland

- Reports the results of the IWeBS from 1994/95 to 2000/01 in terms of site accounts and species accounts.
- 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.
 - Notes that in January 2000 census, Ireland held 43% of the Icelandic wintering population.
 - Notes that main sites in Cavan are Lough Oughter complex, the Erne catchment, Annalee river and Ballinamore Lakes, all are in the north or west of the county and a considerable distance from the study area. The remainder of the notable sites are distributed around the county although there is a cluster of sites around Shercock, lying to the west of route option A.
 - For Monaghan, sites are again scattered around the county but with one concentration around the Dromore lakes and river which lie to the west of route option A, towards Cootehill. There are three sites north of Castleblaney that lie close to the route options B and C. Two sites, Lough Eglisk and Lough Morne that lie either side of route option A with the possibility of a flyway between the two. Two further sites lie to the southeast, close to route options B and C.
 - Lovatt, JK. 2006 **Birds in County Cavan**. Birdwatch Ireland
 - Lough Oughter complex holds internationally important numbers. Other sites that have recorded 100+ Whooper Swans are; Ballymagauran, Ballyheady (Ballyconnell), Killeshandra and Flynn's Pass/Derryheen. Lough Inchin has had 98 with 90 at Lough Ramor.



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