

Meath to Cavan 400kV Overhead Powerline Project
Distribution of Whooper Swan Feeding and Roosting Sites

December 2008

TOBIN CONSULTING ENGINEERS



SOCOIN



REPORT

PROJECT:

Meath to Cavan 400kV overhead powerline project

Distribution of Whooper Swan feeding and roosting sites

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CONFIDENTIALITY

This report has been prepared for EirGrid plc as part of the process in determining the preferred route corridor option for the new 400kV powerline through County Meath. This report forms part of the Environmental Impact Assessment process and will therefore form part of the Environmental Impact Statement. The field studies were undertaken with the co-operation of landowners. Some site location details relating to Whooper Swans are not specified, as requested by individual landowners. These details are known by the authors and are available to statutory agencies upon request.

1 EXECUTIVE SUMMARY

This report describes the results of field studies undertaken monthly between November 2007 and March 2008 and October 2008 and December 2008 (eight months over two seasons). This study is to determine the numbers and distribution of Whooper Swans within a study area that includes the route corridor options for the proposed Woodland to Kingscourt 400kV overhead powerline. Most of the study area lies within Co. Meath.

Survey work between November 2007 and March 2008 will be referred to within the report as Wintering Survey Period 1. Wintering Survey Period 2 from October 2008 is ongoing and will continue until April 2009 as Whooper Swans may potentially be present within the study area during this time.

A desktop study showed that Whooper Swans have been recorded feeding and roosting at sites, chiefly in the valley of the river Blackwater, between Kells and Navan in this study area.

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

Findings to date are subdivided into Wintering Survey Period 1 and Wintering Survey Period 2 (survey findings to date). General conclusions are based on findings to date are provided based on both wintering bird surveys.

Wintering Survey Period 1 (November 2007 – March 2008)

During Wintering Survey Period 1 (November 2007 – March 2008), feeding sites were located at Cruicetown with a peak of 82 Whooper Swans, Grange with a peak of 146 Whooper Swans (although this site was not used from January 2008 onwards) Fyanstown and Teltown with a peak of 38 Whooper Swans. The latter two sites were only used in February and March. Seven Whooper Swans were reported present, in the Newcastle Lough area from November 2007 until February 2008. This group appeared to be a family group that fed and roosted at Newcastle Lough. Whooper Swans were recorded on only one occasion at three other sites; Balrath with 54 Whooper Swans, Carnaross with 19 Whooper Swans and Breakey Lough with two Whooper Swans, suggesting these sites are used as staging posts as the Whooper Swans move either south in the early part of the winter, or north on the return migration at the end of the winter period.

Three roosting sites were identified; Headford Estate with a peak of 200 Whooper Swans, lying just to the east of Kells; Tara Mines tailings ponds with a peak of 43 Whooper Swans, to the northwest of Navan and Whitewood Lough with a peak of 60 Whooper Swans, between Nobber and Kilmainhamwood.

Sites are considered internationally important for Whooper Swans if they regularly support 1% or more of the Icelandic breeding population, i.e. 1% or more of 20,900 (Delany & Scott 2006). Also sites are considered nationally important for Whooper Swans if they regularly support 1% or more of the Irish wintering population of Whooper Swans, i.e. 1% or more of 12,700 (Crowe 2005).

Newly released figures for the population estimates of wintering waterbirds in Ireland give a wintering population of Whooper Swans of 12,730. Any site holding 1% of this population (i.e. 127 Whooper Swans) is considered to be of national importance. The roost at Headford Estate and the feeding site at Grange both reached this threshold figure during Wintering Survey Period 1, with reports that the site at Cruicetown has held over 200 Whooper Swans in the recent past (2006/2007).

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

The staging site at Carnaross lies within route corridor option 1; although it is noted the site that has previously held Whooper Swans near Carnaross is 1km to the west of route corridor option 1. Breakey Lough also lies approximately 1km east of route corridor option 1. No regularly used flightlines crossed this route corridor option.

No flightlines were recorded crossing route corridor option 2. The Balrath site where Whooper Swans were only recorded on one occasion lies on the eastern boundary of this route corridor option, and again, Breakey Lough lies within 1km of this route corridor option. The Carnaross site also lies within this route corridor option.

Route corridor option 3 has two sub-options; 3a and 3b. In the southern part of the study area, these two sub-options follow the same route and include the feeding site at Teltown. Whooper Swans were also seen to fly over this route corridor option as they left the Tara Mines tailings ponds. It seems likely that the Whooper Swans that roost at Tara Mines tailing ponds do fly westwards to feed in the Blackwater Valley at either Fyanstown or Teltown. Route corridor option 3a contains the historical sites at Carlanstown and Emlagh but no Whooper Swans were recorded at these sites during this study. A flightline exists across route corridor option 3b as Whooper Swans fly between Cruicetown and Whitewood Lough.

Wintering Survey Period 2 (October 2008 – December 2008)

Surveys have been carried out monthly within the entire study area, between October 2008 and December 2008, and will continue until April 2009. To date this winter, Headford Estate and Whitewood Lough are not been utilised significantly as roosts. These were important sites during Wintering Survey Period 1.

Numbers of Whooper Swan in the study area were relatively insignificant in October 2008 with just small family groups noted at Breaky Lough (5) and Whitewood Lough (4) in October 2008.

During the November 2008 surveys, numbers were significant at a number of locations in the southern half of the survey area only, these were clustered into two main feeding sites; Balrath and the Blackwater Valley near Kells, with the roost site at Tara Mines tailing ponds also utilised.

Tara Mines tailing ponds was confirmed as a significant roost site in November 2008 though was not used in December 2008. A peak count of 145 swans (Nationally significant numbers) were noted during November 2008. These figures tie in with previous studies carried out by Colhoun (2005) though numbers were much lower in Wintering Survey Period 1. During this survey period the main roost site in the study area was Headford Estate which has not been used significantly so far this year (2008). A significant flightline (>70 Whooper Swans) was confirmed crossing route corridor option 3b from Tara Mines tailing ponds along the River Blackwater Valley. Whooper Swans (62) feeding in the Sedenrath area (Blackwater Valley) were likely to be the Whooper Swans flying from the roost at Tara Mines tailing ponds as Headford Estate had not been used to a significant level during this period. In addition observations by locals in the Teltown area confirm a regular dawn and dusk flightline between the Tara Mines tailing ponds roost site and feeding grounds in the Blackwater Valley. From early December 2008 up to 50 Whooper Swans have been reported roosting at Headford Estate.

A large flock (nationally significant) of feeding Whooper Swan (128) was also noted in the Balrath area in November 2008 and smaller numbers in December 2008. These Whooper Swans were confirmed during the survey as a separate flock to those feeding in Sedenrath (Blackwater valley). It is unlikely given the distance (13km), that these Whooper Swans roost at Tara Mines tailing ponds. No Whooper Swans were noted roosting at Headford Estate, during this period. Therefore, these Whooper Swans either roost within the large field where they were feeding (as this area is very open (>50 hectares) with good visibility to allow predator detection); or at an unknown site. A flightline was confirmed which does traverse route corridor option 2 at this location.

Numbers of Whooper Swans to date are relatively low in the northern half of the survey area. Ten Whooper Swans were noted on Newcastle Lough (late November 2008) and two were noted on Whitewood Lough during this survey period. Approximately 30 unidentified swan species were noted by a third party at Cruicetown during early December 2008, but none were noted by the Project Team.

In December 2008 a new site located under the proposed route corridor option 3b was confirmed near Clooney Lough (49 Whooper Swans).

Conclusions to date for Wintering Survey Period 1 and 2

Based on survey findings to date, it appears that route corridor option 1 affects the least number of sites and flightlines.

Route corridor option 2 may potentially impact feeding Whooper Swans that reach nationally significant levels in the Balrath area.

Route corridor option 3 will potentially impact on the feeding site at Teltown and the flightline between the Blackwater Valley and Tara Mines tailing ponds (these were confirmed during both wintering surveys). Additionally, route corridor option 3b will cross the flightline between Cruicetown and Whitewood Lough (based on Wintering Survey Period 1 study). This is, however not confirmed yet for Wintering Survey Period 2. A third potential site which will require further survey is the area around Clooney Lough where a flock (49) was noted in December 2008.

Any feeding site currently in use that lies within this route corridor option may potentially be abandoned by Whooper Swans. This will depend on the final location of the pylons and powerline within the footprint and land take of the pylon, coupled with the presence of the overhead wires and existing natural features such as tall hedgerows, deterring Whooper Swans from landing in these fields. This would need to be assessed on a site by site basis and would include the presence of alternative suitable habitat within the vicinity of these sites.

Mitigation measures will be required in areas which have a high risk of bird collision with the powerlines, notably where flight lines cross the route and known feeding sites. Based on survey work to date on route corridor option 3 these areas include the area around Teltown encompassing the entire Blackwater Valley and the area of line between Cruicetown and Whitewood Lough. An additional site near Clooney Lough may also require marking though further survey work is required to confirm this. The length of line requiring marking has not yet been fully determined and will depend on final pylon location. On route corridor option 2 these areas include the area around Balrath.

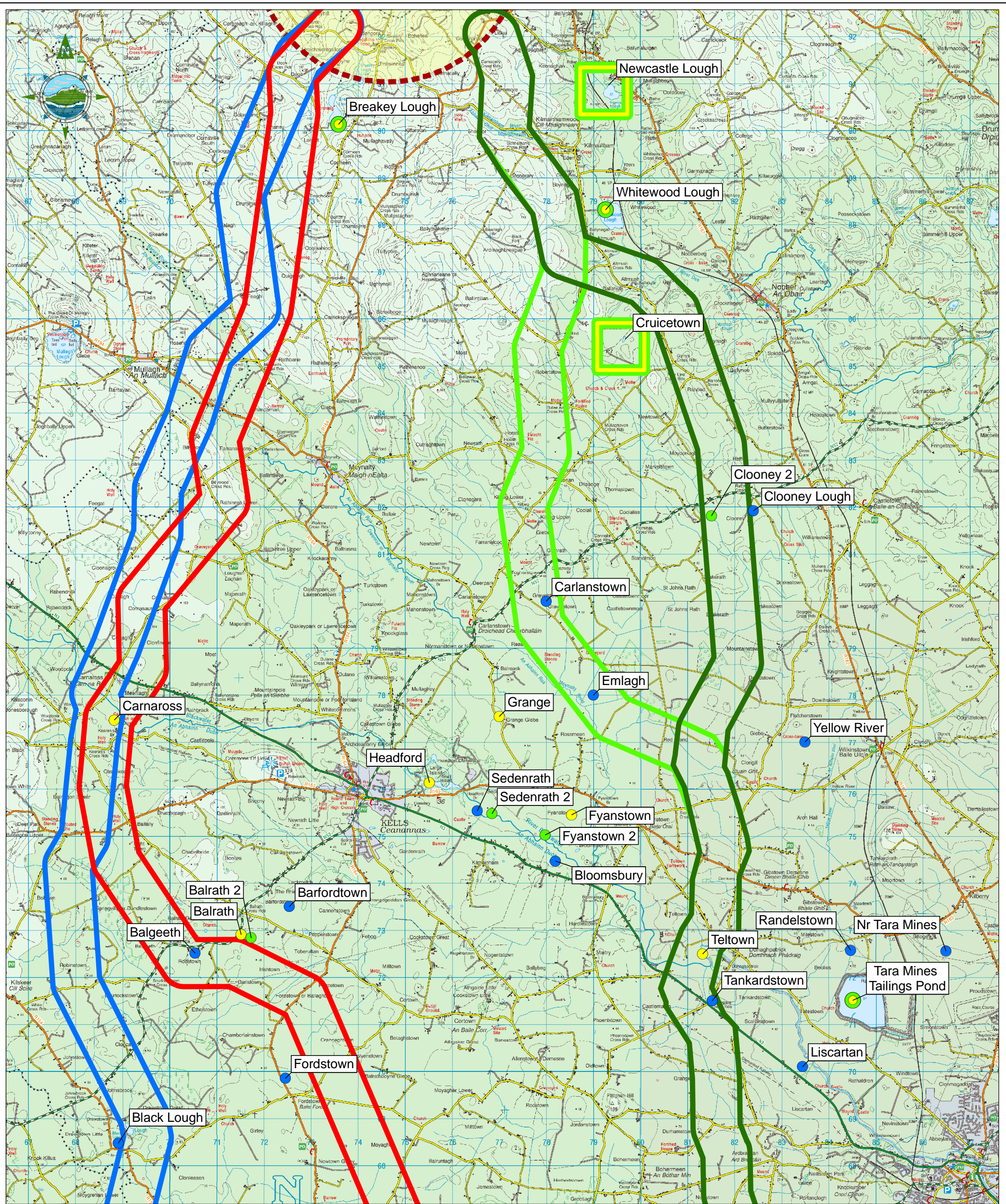
Mitigation measures will be in the form of marking the powerlines. The availability of suitable markers and recommended spacing of such on powerlines will be researched so visibility by Whooper Swans is maximised for most environmental conditions.

A review of how effective line marking can be in reducing bird collisions with powerlines was undertaken by McKenzie Bradshaw Environmental Consulting (2006) for the proposed Beauly to Denny 400kV overhead transmission line in Scotland. Their review found that most studies undertaken have shown that suitable line marking results in significant reductions in bird collisions.

The use of such mitigation measures should ensure that the proposed overhead powerline will not significantly impact on the internationally important Irish wintering population of Whooper Swans. This will require confirmation by undertaking further studies to determine the level of potential impact at

individual sites where the proposed powerline would cross identified flight lines or feeding sites. This survey work is ongoing and will continue throughout this winter until April 2009. This will provide a more detailed study of Whooper Swan feeding, roosting and flight patterns in the study area for the entire period that Whooper Swans may be present.

The impact of siting pylons within known feeding sites will need to be assessed on an individual site basis and will determine whether there is suitable alternative habitat that could be used by the Whooper Swans.



— Route Corridor Option 1
— Route Corridor Option 2
— Route Corridor Option 3A
— Route Corridor Option 3B

● 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
 Swan sites areas confidential

Scale @ A3: 1:75,000

0 0.25 0.5 1 1.5 2 Kilometers

Issue	Date	Description	By	Chkd.
B	15-12-08	Issued	A.G.	M.H.
A	04-11-08	Issued	A.G.	M.H.

NOTES
 1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
 3. BUILDING LOCATIONS SOURCED FROM GEO DIRECTORY
 4. DISTANCES ARE FROM OUTER EXTREMITY OF PYLON

Client:

Project: **KINGSCOURT TO WOODLAND 400kV OVERHEAD LINE ROUTES**

Title: **WHOOPEER SWAN DISTRIBUTION WITHIN ROUTE CORRIDOR OPTIONS**

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Date: November 2008

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4394-KW Figure 1

Issue: B

2 INTRODUCTION

TOBIN Consulting Engineers have been retained by EirGrid plc to undertake a study into the distribution of Whooper Swans (*Cygnus cygnus*) within the Navan/Kells area of County Meath and to determine whether there is any potential conflict with the proposed Meath to Cavan 400kV overhead powerline project.

The Meath to Cavan 400kV overhead powerline project will provide a new powerline linking an existing substation at Woodland in County Meath to a new substation close to Kingscourt in County Cavan. Three route corridor options have been selected as potential options for the location of this powerline. Two of these route options pass to the west of Kells, whilst the third option crosses through the Blackwater Valley between Kells and Navan. A constraints study undertaken for this project by TOBIN Consulting Engineers identified that the Blackwater Valley between Kells and Navan supports a wintering population of Whooper Swans. Furthermore, the river Blackwater forms part of the River Boyne and River Blackwater candidate Special Area of Conservation (cSAC), a site designated for nature conservation under the EU Habitats Directive (EU 92/43/EEC) and the site synopsis for this cSAC makes specific reference to the wintering population of Whooper Swans found in this area. 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 designating areas of important habitat under Article 4 of the Directive as 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 Swans 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. Icelandic breeding Whooper Swans that overwinter in Ireland and Britain form a distinct flyway population.

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 are also known to feed on cereal stubble in autumn (split grain), winter cereals (green leaves), waste potatoes and fodder beet. They also occur in estuaries where they feed on green algae, *Zostera*, and saltmarsh plants. 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 is ongoing and will continue until April 2009. Works to date have been undertaken during Wintering Survey Period 1 (November 2007 to March 2008) and Wintering Survey Period 2 (October to December 2008). The study seeks to determine current numbers and distribution of Whooper Swans in

the 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.

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 and follows the study area chosen by TOBIN Consulting Engineers during the constraints study (July 2007) that identified the route corridor options. The following description of the study area is taken from the constraints study report:

“The study area chosen is situated in a north-south axis between the existing Woodland 400kV substation in County Meath and a proposed substation near Kingscourt County Cavan. The study area is bounded to the north by Kingscourt town in County Cavan, to the south by Woodland substation in County Meath. The area is bound to the east by the Hill of Tara and the town of Navan and to the west by the towns of Trim and Athboy. Settlement locations within the study area include Athboy, Dunshauglin, Kells, Navan, Nobber, Moynalty, Mullagh and Trim.

Within the physical landscape two main rivers will be traversed, the River Blackwater to the north and the River Boyne to the south. The River Boyne, in the south of the study area, dominates the natural surface water environment. It flows in a southwest to northeast direction through the towns of Trim and Navan. The River Blackwater flows in a northwest to southeast direction from Kells before entering the Boyne at Navan. The largest surface water body is Proudstown Reservoir approximately 1km², located northwest of Navan.

The topography surrounding the study area is of rolling lowland and drumlin landscape. The only considerable elevations are the hills of Loughcrew (276m O.D.) in the western extremity of County Meath. Lough Sheelin forms a small part of the county boundary towards Cavan. The quantity of bog is small in proportion to that of the general surface area, and very unequally distributed. The landuse within the study area is predominantly improved pasture exploited with agricultural activities.

The study area encompasses approximately 67,000 hectares, predominantly in County Meath and a small area situated in County Cavan”.

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:

- 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

- Cranswick, P, Bowler, JM, Delany, SN, Einarsson, O, Gardarsson, A, McElwaine, JG, Merne, OJ, Rees, EC, & Wells, JH. 1996. Numbers of Whooper Swans *Cygnus cygnus* in Iceland, Ireland and Britain in January 1995: results of international Whooper Swan census, *Wildfowl* 47: 17-30.
- 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
- Delany, S. & Scott D. 2006. *Waterbird Population Estimates*. Fourth Edition. Wetlands International, Wageningen, The Netherlands.
- Hutchinson, C. 1979. *Ireland's Wetlands and their Birds*. Irish Wildbird Conservancy, Dublin.
- McElwaine JG, Wells JH and Bowler, JM 1995. Winter movements of Whooper Swans visiting Ireland: preliminary results. *Irish Birds* 5(3) 265-278.
- Merne, OJ & Murphy, CW. 1986. Whooper Swans in Ireland, January 1986. *Irish Birds* 3(2):199-206.
- 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.
- Sheppard, R. 1993. *Ireland's Wetland Wealth – the birdlife of the estuaries, lakes, coasts, rivers, bogs and turloughs of Ireland*. The report of the Winter Wetlands Survey, 1984/85 to 1986/87. Irish Wildbird Conservancy, Dublin.

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 1 or to the east of route corridor option 3 were selected as sites that should be included in the field studies.

3.1.2 Consultation

Consultation letters were sent to the National Parks and Wildlife Service (NPWS), BirdWatch Ireland and the Irish Whooper Swan Study Group. In addition, Oscar Merne, one of the authors of the papers on Whooper Swans in Ireland and an expert on Whooper Swan distribution and ecology in Ireland, provided a quality review of the report on works from Wintering Survey Period 1.

Following on from the consultation letter, a meeting was held with NPWS local staff on the 19th of September, 2007. NPWS provided further information on sites and also of local birdwatchers who may know of the location of Whooper Swan sites in the area. Meetings were subsequently held with two local birdwatchers who were able to give further details on the use of two known roosting sites.

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 their wintering sites was 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.

During Wintering Survey Period 2, further consultation and meetings were held with local land owners and interested parties who have sites utilised by Whooper Swans and/ or were interested in volunteering information on Whooper Swan locations and movements in the study area. These sites were visited to assess if Whooper Swans were present.

3.2 FIELD STUDY

There were two aims for the fieldwork:

1. To locate Whooper Swan feeding and roosting sites within the study area and to record numbers of birds 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 and roosting sites

The results of the literature search and consultation produced a list of feeding and roosting sites that have previously held Whooper Swans. This list of sites was added to as further details were supplied by members of the public during the course of the study and observations made by the Project Team during survey. All sites described may be used by Whooper Swans up to late-March /early-April. Therefore surveying during survey period 2 is being extended to April, and will confirm the presence or absence of Whooper Swans.

During the Wintering Survey Period 1, sites were checked once a month during daylight hours between September 2007 and March 2008, with the final winter field visit for this period being 12th March 2008.

This seasons survey work commenced in October 2008 and the results in this report are up until the 12th of December 2008. This survey work will continue monthly to April 2009 to provide a full season of field survey.

All sites are scanned using binoculars and telescopes, where appropriate, from vantage points on public roads. Likely habitats close to these sites are also checked as are areas deemed suitable for Whooper Swans that were seen whilst driving between sites.

The number of adults and first winter birds Whooper Swans are recorded. In addition numbers of other bird species associated with the Whooper Swan flocks, weather conditions and habitat type are also recorded.

To date during the course of the study, members of the public also supplied records of sightings of Whooper Swans. Follow up visits are made to check on new sightings where possible and all details of records submitted to the Project Team have been kept.

3.2.2 Determination of flightlines

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 at least a further hour. Numbers of Whooper Swans, time of observation, direction of flight and approximate flight heights were recorded.

Dawn and dusk watches were conducted at Tara Mines tailings ponds, one of the main roost sites that had been previously identified during the literature search and consultation process. The second main roost site, Headford Estate, was counted by a local birdwatcher. The Project Team undertook a count at this site on two occasions in Wintering Survey Period 1. Simultaneously, dawn and dusk watches were also carried out at a vantage point on route corridor option 3b. The vantage point was situated so as to give a view to the river valleys north and south (Refer to section 4.2.2 for details on why these locations were chosen for the dawn and dusk watches).

In addition, watches were made at a site near Cruicetown, lying towards the northern end of route corridor option 3b, from January 2008 when the Project Team became aware of this site. It appears to be a site that has been used by Whooper Swans regularly for the past 40 years. The roosting location was likely to be Whitewood Lough or Newcastle Lough, small lakes lying some 2km and 4km respectively to the north of known roost sites.

4 RESULTS

4.1 DESKTOP STUDY

The literature search and consultation exercise identified 21 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 Ref	Available count numbers	Comments
Grange	N7777		
Emlagh	N7978		
Sedenrath	N7675		
Headford	N755763	60, Feb 96 1, Jan 00	Roost site
Bloomsbury	N782747	162, Jan 06	Regularly used site for last two years
Carlanstown	N7880	142, Feb 03	Feeding in improved pasture
Barfordstown	N7273		
Fordstown	N7269	87, 15 Jan 05 14, 5 Feb 03	Feeding in cereal and potato fields In flight
Black Lough	N6868	1, 15 Jan 05	Feeding in pasture
Balgeeth	N7072	60, 14 March 03	In improved pasture
Tara Mines tailing ponds	N840710	142 (2005 census)	Roost In flight towards Tara Mines tailing ponds
Randelstown	N8472	40-50, Nov 02	
Yellow River	N8377	191, Jan 98 244, Dec 01 16, Feb 02	
Liscartan	N8370	190+, 17&18 Nov 04	Feeding in stubble field
Nr Tara Mines tailing ponds	N8672	142, 26 Jan 05	Feeding in potato field In flight towards Tara Mines tailing ponds
Tankardstown	N8171	40-50, 3 Nov 02	
Carnaross	N6779		Appears to be a late season site
Breakey Lough	N736902		
Clooney lough	N824819		
Whitewood Lough	N794883		
Newcastle Lough	No exact details		

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

Three main concentrations of Whooper Swan sites were identified in both Wintering Survey Periods.

1. An area to the south west of Kells (including Black Lough, Fordstown,, Balgeeth, Balrath and Barfordstown)
2. A cluster of sites in the centre of the study area that includes the roost site at Headford (including Sedenrath, Grange, Bloomsbury, Fyanstown, Emlagh and Carlanstown)
3. A group of sites to the east of the study area including the roost site at the Tara Mines tailing ponds (Liscartan, Tankardstown, Teltown, Randelstown, Nr. Tara Mines and Yellow River).

The remainder of the identified sites are outlying sites, chiefly to the north of the study area (Newcastle Lough, Whitewood Lough, Breaky Lough, Cruicetown and Clooney Lough) but also including Carnaross, west of Kells.

4.2 FIELD STUDY

4.2.1 Feeding Areas

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

Wintering Survey Period 1

- 6th November 2007
- 5th December 2007
- 10th January 2008
- 8th February 2008
- 12th March 2008

Wintering Survey Period 2

- 29th and 30th October
- 19th and 20th November 2008
- 27th November 2008
- 11th and 12th December 2008

All of the counts were undertaken in suitable weather conditions with good visibility. The results of the maximum counts for each survey are given in Table 4.2 below. A minimum total count of Whooper Swans in the total survey area is included for each date.

The Fyanstown, Teltown and Cruicetown sites are all sites that came to light through consultation during the course of the study and so were not included in the early part of the first Wintering Survey Period counts.

The 54 Whooper Swans recorded at Balrath were noted on 5th December 2007, this site was subsequently checked on all of the following survey dates. The 43 swans recorded east of Clooney Lough were noted on the 12th of December 2008, this site will be checked on all future survey dates. Both these areas are large arable fields with patches of winter flooding and are utilised for foraging and possibly roosting. The detection of new forage and possible temporary roost sites demonstrate the dynamic movements of Whooper Swan flocks responding to forage opportunities.

The survey periods; Wintering Survey Period 1 (November 2007 to March 2008) and Wintering Survey Period 2 (October 2008 to December 2009) are discussed separately. General findings for these two periods are detailed separately and summary findings are provided based on the overall survey period to date.

Key observations Wintering Survey Period 1 (November 2007 – April 2008)

Only one site held Whooper Swans on three separate occasions, this is Whitewood Lough. This site was also used as a roost site for the Whooper Swans that feed at Cruicetown.

Whooper Swans were recorded on two survey dates at two other locations; Grange and Cruicetown. Additional records received for Cruicetown (see section 4.2.4 Additional Records) suggest that Whooper Swans were present from November 2007. Local reports also suggest that the site at Grange was used by Whooper Swans from late November 2007 until the period between Christmas and New Year when the Whooper Swans stopped using this site.

Six other sites held Whooper Swans on only one date. The owners of a site at Newcastle Lough supplied additional records that showed that the site was in use from early November 2007 until late February 2008, usually by a family group of seven Whooper Swans but bigger numbers were using the site in February as a roost. Similarly, Whooper Swans were recorded at Teltown on one occasion but additional records showed that Whooper Swans were present at this site intermittently between mid January 2008 and mid March 2008. Whooper Swans were recorded at Balrath in December and not thereafter, furthermore, there were no other records of Whooper Swans in this area. Carnaross and Breakey Lough only held Whooper Swans in March 2008. This confirms the information given by NPWS staff that Carnaross is used in the late winter period.

Key observations Wintering Survey Period 2 (October – December 2008)

Three total monthly counts of the entire survey area were conducted between October and December 2008. Surveys will also be completed in January, February, March and April 2009. Therefore the survey results for this period are inconclusive.

No significant Whooper Swan usage was noted in October 2008 with a maximum count of eight at Breakey Lough and Whitewood Lough only.

Whooper Swan numbers built up significantly in November 2008. During this month they were noted focussing feeding in the southern portion of the survey area at two main locations; the Blackwater Valley area (at Fyanstown/ Sedenrath Bloomsbury areas) and a second location at Balrath. These Whooper Swans were concentrated in large flocks (range of 45 – 128 Whooper Swans) and were feeding in extensive arable fields. The presence of a large flock of roosting Whooper Swan at Tara Mines tailing ponds during this period (145); noted flightlines and no records for the Newcastle Lough roost suggest, that Whooper Swans at Tara Mines tailing ponds are the same as those feeding in the Sedenrath and Bloomsbury area close to the Blackwater River. The roost area for the Whooper Swans at Balrath is not known however given the very extensive fields and temporary flooding here it is likely that they were roosting here as no Whooper Swans were roosting at Newcastle Lough (4 – 5km) during this period and Tara Mines tailing ponds is located at a distance of >13km. No other known roost sites exist in this area.

During the December 2008 survey Whooper Swan numbers were slightly lower at Balrath (45) and similar in Sedenrath (105). The detection of a flock (49) further north near Clooney Lough suggests that some of these Whooper Swans may have moved further north.

Table 4-2 Numbers of Whooper Swans recorded

Site Name	Grid Ref	Wintering Survey Period 1					Wintering Survey Period 2		
		06/11/2007	05/12/2007	10/01/2008	08/02/2008	12/03/2008	30/10/08	20/11/08	12/12/08
Grange	N770774	0	146	13	0	0	0	0	0
Emlagh	N7978	0	0	0	0	0	0	0	0
Sedenrath	N7675	0	0	0	0	0	0	62	0
Fyanstown	N785755	N/C	N/C	N/C	N/C	59	0	0	105
Bloomsbury	N782747	0	0	0	0	0	0	11	0
Carlanstown	N7880	0	0	0	0	0	0	0	0
Barfordstown	N7273	0	0	0	0	0	0	0	0
Fordstown	N7269	0	0	0	0	0	0	0	0
Balrath	N715728	0	54	0	0	0	0	128	45
Black Lough	N6868	0	0	0	0	0	0	0	0
Balgeeth	N7072	0	0	0	0	0	0	0	0
Randelstown	N8472	0	0	0	0	0	0	0	0
Yellow River	N8377	0	0	0	0	0	0	0	0
Liscartan	N8370	0	0	0	0	0	0	0	0
Nr Tara Mines	N8672	0	0	0	0	0	0	48	0
Teltown	N813725	N/C	N/C	N/C	0	38	0	0	0
Tankardstown	N8171	0	0	0	0	0	0	0	0
Cruicetown	No details	N/C	N/C	N/C	79	82**	0	0	0
Clooney lough	N824819	N/C	N/C	0	N/C	0	0	0	0
Fields west Clooney Lough	N815817	0	0	0	0	0	0	0	49
Whitewood Lough	N794883	7	N/C	7	1	0	0	2	0
Newcastle Lough	No details	N/C	N/C	N/C	7	0	4	0	0
Carnaross	N689775	N/C	N/C	0	0	19	0	0	0
Breakey Lough	N736902	N/C	N/C	0	0	2	5	0	0
Minimum Count		7	200	20	87	118	9	251	199

**counted on 13/03/08

N/C = Not counted

4.2.2 *Roosting Sites*

The results of the desktop survey identified two roost sites; Tara Mines tailing ponds and Headford Estate. During the consultation process it became apparent that the Whooper Swan roost at the Headford Estate is regularly watched by a local birdwatcher who agreed to provide count data from this site, therefore the Project Team concentrated on roost counts at the Tara Mines tailings ponds.

Figure 1 shows the location of feeding and roosting sites and the location of the route corridor options. From this, it can be seen that route corridor option 3 is most likely to be crossed by any flightline that links roosting and feeding sites. A vantage point was chosen at the church close to Crasulthan cross roads (OS grid reference N815746) to give views to the north and south to look for Whooper Swans crossing over this route corridor option. These vantage point watches were undertaken on the same days and times as the Tara Mines tailings pond watches.

4.2.2.1 Tara Mines Tailings Ponds

Table 4.3 below provides the dates, times of the watch and numbers of Whooper Swans recorded during the roost watches at Tara Mines tailings ponds.

Table 4-3 Numbers of Whooper Swans recorded at the Tara Mines Tailings Ponds

Date	Time ¹	No.'s of Whooper Swans
Wintering Survey Period 1		
05/11/2007	1630-1800	0
06/11/2007	0630-0830	c25
04/12/2007	1600-1730	0
05/12/2007	0645-0840	0
09/01/2008	1600-1730	0
10/01/2008	0645-0830	0
08/02/2008	0630-0815	17
08/02/2008	1630-1800	0
20/02/2008	1645-1830	0
12/03/2008	0615-0800	9
12/03/2008	1700-1930	43
Wintering Survey Period 2		
29/10/08	1645 - 1800	0
30/10/08	0600-0750	0
19/11/08	1630-1800	48
20/11/08	0630-0830	0
27/11/08	0615-0830	145
11/12/08	1600-1800	0
12/12/08	0645-0840	0

Key observations Wintering Survey Period 1

The roost count undertaken on the 20th February 2008 was an additional visit which was made whilst investigating reports of Whooper Swans in the Teltown area.

The roost counts on 5th and 6th of November 2007, 12th March and 29th and 30th of October 2008 were carried out from a minor road at Milestown (OS grid reference N837728) as access into the tailings ponds themselves was not possible on these dates. This point on the road gave a view across to the ponds and it was considered that any Whooper Swans leaving the roost and flying west, north or south would be seen from this point. The other roost counts were undertaken from the top of the perimeter bank around the ponds.

Whooper Swans were recorded leaving the roost on three occasions at dawn but were only recorded arriving once. It is probable that the Whooper Swans were coming in to the roost some time after the roost watch had been completed. On all of the dawn watches that recorded Whooper Swans leaving

¹ Watch times were at dawn and dusk

the roost, the Whooper Swans were seen to be flying west away from the Tara Mines tailings ponds. On the sole occasion when Whooper Swans were recorded during the dusk watch, the Whooper Swans were not seen to arrive due to the poor visibility in the low light conditions but were heard calling as they alighted on the water.

Key observations Wintering Survey Period 2 (October 2008 - December 2008)

Tara Mines tailing ponds held nationally important numbers (145) of Whooper Swan during November 2008 though none were detected in October 2008 and December 2008. This fits in with previous published material on Whooper Swan census carried out such as Crowe *et al.*, (2005) which suggest that this site is a nationally important roost site for this species.

4.2.2.2 Headford Estate

The Headford Estate was counted on a regular basis by a local birdwatcher. The Project Team undertook counts at this site on two dates; 5th December 2007 and 10th January 2008. Table 4.4 below presents the data received from the local birdwatcher and from the two counts undertaken by the Project Team.

Table 4-4 Numbers of Whooper Swans roosting at Headford Estate

Date	No.'s of Whooper Swans
Wintering Survey Period 1	
31/10/2007	10
05/11/2007	15
06/11/2007	2
10/11/2007	45
15/11/2007	50
20/11/2007	100
25/11/2007	150
30/11/2007	200
05/12/2007	198*
10/01/2008	0*
10/02/2008	50-60
05/03/2008	2
13/03/2008	3
Wintering Survey Period 2	
October 2008	0
November 2008	0
Early December 2008	50

*Counts undertaken by Project Team

Key observations Wintering Survey Period 1 (November 2007 - March 2008)

These results show that the numbers at the roost built up through November 2007 and peaked at 198-200 Whooper Swans in late November 2007 early December 2008. This site supporting >130 Whooper Swans is a nationally important site. The roost apparently stopped being used between Christmas and New Year as noted from the local birdwatcher. After New Year, the roost was used intermittently. The high roost counts at Headford Estate coincided with high numbers at the Grange feeding site and the Whooper Swans arriving at the Headford Estate roost were flying in from the direction of Grange. The Grange feeding site was little used after the New Year, with only 13 Whooper Swans recorded here on 10th January and it appears that the Whooper Swans which were feeding at Grange were roosting at Headford Estate.

The numbers of Whooper Swans roosting at Headford on February 10th 2008 is similar to the numbers of Whooper Swans that were found feeding at Fyanstown in mid March 2008, suggesting that a flock of Whooper Swans were present in the Blackwater Valley during February 2008 and March 2008 and that they used the roost at Headford Estate on occasions. A similar number of Whooper Swans were also found roosting at Tara Mines tailings ponds on March 12th 2008 further suggesting that the flock may have also used this roost.

Key observations Wintering Survey Period 2 (October 2008 – December 2008)

No significant roost usage was noted at Headford Estate in October 2008 and November 2008. Whooper swan started to use this site as a roost from early December 2008 with an estimate of 50 Whooper Swans roosting during this period. Whooper Swans were initially noted flying in from the west but on later dates from the east.

4.2.2.3 Whitewood Lough**Key observations Wintering Survey Period 1 (November 2007 – December 2008)**

Whitewood Lough was identified as a roost site during the course of the project, with the Whooper Swans that feed at Cruicetown roosting at Whitewood Lough. This was confirmed on February 19th 2008, when the flock at Cruicetown was observed from 15:25 hours until dusk. Around 18:10 hours, a group of 38 Whooper Swans left the Cruicetown flock and flew northwards. The observer drove to Whitewood Lough where some Whooper Swans were seen to land on the lough, at this stage, in poor light conditions, 33 Whooper Swans were counted. More Whooper Swans were later heard to land but could not be seen in the darkness. On March 13th 2008, no Whooper Swans were seen at Whitewood Lough at 17:10 hours; the observer drove to Cruicetown and saw 83 Whooper Swans. The observer returned to Whitewood Lough and recorded 60 Whooper Swans flying into Whitewood Lough from the direction of Cruicetown. Further Whooper Swans were heard to fly into the roost but could not be seen in the poor visibility.

Key observations Wintering Survey Period 2

Small numbers of Whooper Swan have been noted in October 2008 and November 2008 roosting on Whitewood Lough (max = 4). None were noted during the December 2008 survey.

4.2.3 Flightlines

4.2.3.1 Crasulthan Cross Roads

Dawn and dusk watches were conducted at the church close to Crasulthan Cross Roads (OS grid reference N815746) on the following dates:

- 5th, 6th November 2007
- 4th, 5th December 2007
- 9th, 10th January 2008
- 8th February 2008
- 12th March 2008

No Whooper Swans were recorded crossing the line of route corridor option 3 from this viewpoint. As already stated previously, on all occasions when Whooper Swans were seen to leave the roost at Tara Mines tailings ponds, they flew in a westerly direction, towards this route option corridor. However, they were some distance south from the vantage point at Crasulthan and would not have been visible from this vantage point.

4.2.3.2 Tara Mines Tailing Pond

Key observations Wintering Survey Period 1

On the 12th March 2008, when the Tara Mines tailings pond roost was observed from the minor road at Milestown, the observer was able to follow the nine Whooper Swans that left the roost as they flew westwards and they were seen to cross through the route corridor option just north of Donaghpatrick. This is the only occasion during Wintering Survey Period 1 on which Whooper Swans were directly seen to fly over the route corridor option 3.

Key observations Wintering Survey Period 2

Whooper Swans were detected flying into the Tara Mines tailing ponds on the evening of the 19th of November 2008. Two groups of five and eight Whooper Swans were noted flying at approximately 100m high from the north west and dropping into the ponds to roost. Another three Whooper Swans circled the tailing ponds having initially been detected flying in from the north east. Given that Whooper Swans were detected feeding along the Blackwater Valley to the northwest during the day it is likely that these were the same Whooper Swans.

On 27th November 2008 a nationally significant count of Whooper Swan (145) were recorded roosting at Tara Mines tailing ponds. This tied in with observations by staff at Tara Mines tailing ponds who mentioned that at least a 100 were roosting here at this time. These Whooper Swans were observed flying in a north westerly direction out of Tara Mines tailing ponds following the Blackwater Valley.

Approximately 70 Whooper Swans initially flew out followed by smaller flocks until all Whooper Swans had vacated the Tara Mines tailing ponds roost approximately 30 minutes after dawn.

Third party observations during November 2008 and early December 2008 highlighted a regular flightline out of Tara Mines tailing ponds northwest over route corridor option 3b during the morning along the Blackwater Valley towards Kells returning in the evening to roost at Tara Mines tailing ponds.

4.2.3.3 Whitewood Lough/ Cruicetown

The presence of a regular flock of Whooper Swans at Cruicetown only came to light during the course of the project. The landowner reported that the Whooper Swans sometimes flew to Whitewood Lough to roost. This flightline would cross the sub-option of route corridor option 3, route 3b. In order to confirm the roosting location observations were carried out here on the following dates,

- 19th February 2008
- 29th, 30th October 2008
- 19th, 20th November 2008

On February 19th 2008 the feeding flock was observed from 15.25 hours until dusk when the first Whooper Swans left the feeding site. The observer then drove to Whitewood Lough and was able to see Whooper Swans flying in.

On a second occasion the observer was able to count Whooper Swans leaving the feeding site and then count Whooper Swans arriving at Whitewood Lough.

No flightlines were detected between October 2008 and December 2008.

4.2.3.4 Balrath

A flight line was detected on 20th November 2008 at Balrath where eight Whooper Swans were noted flying from the south at approximately 100m high and dropping to feed with the large flock already present. This flightline would cross route corridor option 2.

4.2.4 Additional Records

During the course of the study, landowners and local people provided records and information on Whooper Swans using sites within the study area. These additional records are presented in Table 4.5. Records provided for the roost at Headford Estate have been presented in 4.2.2.2 above

Table 4-5 Additional Records

Site	Date	No.'s of Whooper Swans
Wintering Survey Period 1		
Newcastle Lough	25/01/2004	14
	14/03/2004	32
	early Nov 2007	7
	22/02/2008	20+
	24/02/2008	37
	1/12/08	8
	8/12/08	5
Cruicetown	March 2007	160
	Nov 2007	31
	Dec 2007	30-40
	Jan 2008	60
	27/01/2008	102
	04/02/2008	80
	10/12/2008	30 "swans"
Teltown	15/01/2008	80-90
	02/02/2008	30-50
	15/02/2008	c90
	16/02/2008	c50
	17/02/2008	c50
	18/02/2008	c50
	19/02/2008	c50
	06/03/2008	c90
	15/03/2008	60
Wintering Survey Period 2		
Donaghpatrick Area	Early December 2008	Daily flights with number range recorded: 7 to 30

Newcastle Lough

The owners of this site recorded Whooper Swans at this site since 1993 with a recorded maximum of 53 Whooper Swans. The Project Team also recorded Whooper Swans present here in February 2008. This site lies only some 3km to the north of Whitewood Lough and it is probable that Whooper Swans may move between these sites. Whooper Swans were noted more recently in small numbers roosting on 1st and 8th December 2008 by the owner. In addition the owner noted Whooper Swans flying over this area during the last week in November 2008.

Cruicetown

The owner of this site has seen Whooper Swans at this site since the late 1950's/early 1960's. Numbers in the last two years have been high with up to 200 Whooper Swans feeding here. The Whooper Swans usually arrive in November and build up to peak numbers in February/March and frequently stay into April. The Project Team recorded Whooper Swans here in February and March

2008. The Whooper Swans that use this site for feeding, have been recorded roosting on Whitewood Lough (Refer to section 4.2.2.3 above). A flock of 30 “swans” noted by the landowner on 10th December 2008 are likely to have been Whooper Swans though only a small numbers of mute swan were noted by the Project Team on the following day.

Teltown

People living close to this site report that Whooper Swans have been using this site since at least 1989. The Whooper Swans usually arrive in mid January and stay until the end of February. The Project Team only recorded Whooper Swans present at this site in March 2008. The pattern of records provided to the Project Team suggest that this site is not used continuously by the same flock but that a number of flocks use the site as a staging site, staying for a short period of time before moving on, or possibly used in conjunction with other sites in the Blackwater Valley. This area was described as being regularly flown over in December 2008 by Whooper Swans moving between foraging areas in the Blackwater Valley and Tara Mines tailing ponds (roost site).

4.2.5 *Other species of note*

Tara Mines tailing ponds

On 19th of November 2008 large numbers of golden plover *Pluvialis apricaria* (>3000 individuals) were noted as roosting at Tara Mines tailing pond. This species is listed on Annex 1 of the EU Birds Directive and a flock of this size is considered nationally significant. This flock flew northwest from Tara Mines tailing ponds at Dawn and small flocks of golden plover detected as feeding in the Blackwater Valley during the day survey are likely to have been these birds.

Other species noted at Tara Mines tailing ponds include lapwing (max 150), curlew (max 30), gull species – mainly black headed (500+), mallard and other unidentified duck (>400), teal (10) and a single brent goose.

5 DISCUSSION

5.1 FEEDING SITES

The recently published figures for numbers of waterbirds wintering in Ireland (Crowe *et al*, 2008) show that the wintering population of Whooper Swans in Ireland is 12,730. Any site that regularly holds 1% of this figure (i.e. 127 Whooper Swans) is considered to be of national importance for Whooper Swans.

The overall survey area regularly retains nationally significant populations of Whooper Swan spread out into four main clusters utilised to varying degrees depending on time of year, food availability and probably roost security. Not all Whooper Swans recorded during the survey periods can be linked to the roost sites at Tara Mines tailing ponds and Headford Estate as large numbers of feeding Whooper Swans at Balrath for example were not roosting at these roost sites and may likely be roosting within feeding grounds.

Two sites within the overall survey area, exceeded the qualifying national figures for Whooper Swans. These are discussed below

Grange (2007/early 2008): exceeded this qualifying figure during Wintering Survey Period 1. The roost site for the Whooper Swans feeding at Grange was determined as the Headford Estate and the flightline between the two sites did not cross any of the route corridor options.

Balrath (late 2008): exceeded this figure during Wintering Survey Period 2 when a large group (128) was noted in a large arable field. These Whooper Swans were not roosting at Headford Estate and Tara Mines tailing ponds was unlikely to be a roost site given its distance (>13km). These Whooper Swans were likely to have been roosting at their feeding location or at another undetermined site.

No other site held nationally important numbers of Whooper Swans in Wintering Survey Period 2. The Cruicetown feeding site has reportedly held up to 200 Whooper Swans in the recent past but during this survey, a maximum of 82 Whooper Swans were recorded (Winter Survey Period I).

Other important sites noted in late 2008 include Sedenrath and Fyanstown which during November 2008 and December 2008 had counts of 73 and 105 Whooper Swans respectively within a relatively small area along the Blackwater Valley.

Within the study area, it would appear that the feeding sites fall into four clusters of sites based on both survey periods survey work to date.

1. Currently (outside of Balrath) the western cluster including Carnaross, Balgeeth, Fordstown and Black Lough, appear chiefly to be areas that are used when Whooper Swans are migrating and not as regular overwintering sites. Balrath, appears to be an important foraging area at least in some years depending on food resources. It is not known currently where Whooper Swans

which use these sites roost at night though at Balrath they may roost at the foraging areas as localised flooding and the open terrain may suit them.

2. A central cluster using either Headford Estate or Tara Mines tailing ponds as the roost. This includes the sites in the Blackwater Valley; Sedenrath, Fyanstown and Bloomsbury, and the outlying sites at Grange, Emlagh and Carlanstown.
3. A network of sites further east along the Blackwater Valley that roosts at Tara Mines tailing ponds including Teltown, Tankardstown and Liscartan, and historically the sites in the Yellow River area. In Wintering Survey Period 2, Whooper Swans feeding in the overall Blackwater Valley as far as Kells were likely roosting in Tara Mines tailing ponds up to 8km from feeding sites.
4. A northern cluster that includes Cruicetown, Whitewood Lough, Breakey Lough, Newcastle Lough and Clooney Lough was determined during Wintering Survey Period 1. Wintering Survey Period 2 has not determined significant Whooper Swan usage in this area suggesting, as noted in Wintering Survey Period 1, that this area becomes more important later in the season. The location of a flock (49) close to Clooney Lough in December 2008, within the route corridor option, potentially indicates this seasonal dynamic movement as a response to foraging. With the exception of Cruicetown and the area close to Clooney Lough, all the other sites are thought to be suitable as roosts with Whooper Swans probably using the immediately adjacent fields for feeding. Breakey Lough is probably another stopover site that is used infrequently and not throughout the winter period.

All of these clusters contain sites where Whooper Swans were recorded in the past and in some cases during the course of this study. This shows that Whooper Swans can react to local conditions and will choose sites that provide them with suitable feeding habitat. While, Whooper Swans generally require suitable feeding habitat to be reasonably close to their roosting sites; the number and distribution of roost areas particularly in the south of the study area is probably a constraint within this part of Ireland which leads to quite extensive daily migration to rich feeding areas (predominantly arable crops such as potato and grain stubble) and/ or roosting in areas of temporary winter flooding in extensive arable areas which provide good visibility for predator detection.

Due to rotational constraints of tillage areas, Whooper Swans are prevented from using the same fields year after year where by in contrast, permanent improved pasture can support flocks of Whooper Swans over long periods, thus enabling them to establish a high level of site fidelity.

This seasonal feeding pattern is evident as noted at the north of the study area where arable crops are scarce and Whooper Swans feed in small family groups on improved grassland and generally commute to small lakes (Whitewood, Breakey and Newcastle Lough) to roost. The concentration of large flock recorded, in the more arable landscape in Meath during the early part of the winter suggests that these are favourable / optimal forage areas where Whooper Swans can fatten up on available arable crop

remains before spreading out into smaller flocks and moving into more improved grassland habitats with small lakes in the Northern portion of the study area, later in the winter.

Further details on the sites where Whooper Swans were recorded during this study are given below.

Grange

This site was utilised during Wintering Survey Period 1 and is a large field that had been used for potatoes and that had been harvested. This area was ploughed in Wintering Survey Period 2 and therefore of little value for Whooper Swans and consequently none were observed. During the Wintering Survey Period 1, a large flock of Whooper Swans had used this field with 146 being recorded on December 5th 2007. This site only lies some 2-3 km to the northeast of the Headford Estate roost and numbers from this roost suggest that Whooper Swans were using the field at Grange from mid-November to the Christmas/New Year period. It is not known why the Whooper Swans stopped using this area; some unharvested potatoes were still evident in the field but perhaps there were insufficient quantities to sustain the large flock and so they dispersed looking for other food supplies. Potato waste is often unavailable in winter due to the resource being eaten out by Whooper Swans, rooks and other birds and being damaged by frosts and through decomposition.

This site was ploughed for Wintering Survey Period 2 and therefore is not being used currently.

Fyanstown

This site was utilised during Wintering Survey Period 1. It appears to have been used by Whooper Swans from February 2008 on, although Whooper Swans were only recorded by the Project Team on March 12th 2008. Numbers of Whooper Swan at the Headford Estate roost in February suggest that a flock of Whooper Swans was present somewhere in the vicinity of Headford during this time and they were recorded flying into the roost from the direction of Fyanstown (S Holt *pers comm.*) It is also possible that at least some of these Whooper Swans were using the Tara Mines tailing ponds roost as the nine Whooper Swans that were seen to leave the Tara Mines tailing ponds roost on March 12th were seen to cross the line of route corridor option 3 and to continue to fly westwards towards Fyanstown. When they crossed this route corridor option, they were to the north of Teltown, the other feeding site known to be in use at that stage of the year. Fields in this area were also used in November 2008 and December 2008 close to the Blackwater River.

Teltown

This site was utilised during Wintering Survey Period 1. None have been recorded to date in Wintering Survey Period 2. This was an improved grassland field with river Blackwater running alongside it. Whooper Swans were recorded here on March 12th 2007 but additional records show that they were present intermittently from mid January 2008 to mid March 2008. It is not known where these Whooper Swans roost, the nearest roost is at Tara Mines tailings ponds and Whooper Swans were seen to leave the roost and fly westwards but it was not confirmed that they flew to Teltown.

Cruicetown

This site was utilised during Wintering Survey Period 1. None have been recorded to date by the Project Team in Wintering Survey Period 2, though approximately 30 swan species were recorded by the landowner in December 2008 which probably included Whooper Swan. This site appears to be the most reliable feeding site in the study area in that it has been used since the late 1950's and it is also reported that up to 200 Whooper Swans have used this site in the past. Numbers present at the site during this study did not reach nationally important numbers so far. The Whooper Swans that feed at this site, roost on Whitewood Lough with the flightline between the feeding and roosting site crossing the proposed route corridor option 3b. If this route is to be chosen, then further studies to look at the potential impact on the use of this site should be undertaken. The Cruicetown feeding site is at a height of approximately 80m AOD whilst the Whitewood Lough is at 51m AOD. Depending on the exact location of the powerline, there is a possibility that the Whooper Swans would have sufficient height as they take off from the Cruicetown site to fly over the powerline. However, this altitude differential may only benefit the swans flying one way but the uphill flight in the opposite direction could be a disadvantage, especially in strong headwinds. In such circumstances the Whooper Swans could be forced to fly lower and at a greater risk of collision with powerlines. This aspect needs more thorough investigation once a final route corridor option has been chosen.

East Clooney Lough

A flock of swans (49) was noted within the route corridor 3b in December 2008 close to Clooney Lough. These Whooper Swans are likely responding to local food availability indicating that this species is not necessarily site specific in terms of foraging, in the southern part of the survey area at least. This area will require further monitoring during the course of the survey season.

5.2 ROOSTING SITES

Three significant regular roosting sites were identified; Headford Estate, Whitewood Lough and Tara Mines tailings ponds. Smaller lakes such as Breaky and Newcastle Lough are also used at least on occasion by Whooper Swans. The Headford Estate held nationally important numbers of Whooper Swan in Wintering Survey Period 2; these were the Whooper Swans that were feeding at Grange. After the Whooper Swans stopped using Grange, numbers at Headford Estate dropped and usage of the roost became intermittent. It is possible that Whooper Swans may be temporarily roosting in winter flooded arable fields around Balrath though this has not yet been confirmed.

Tara Mines tailing ponds held nationally important numbers of Whooper Swan during November 2008 though none were detected in December 2008. This fits in with previous published material on Whooper Swan census carried out such as Crowe *et al.*, (2005)

It would appear likely that the Whitewood Lough roost site was used during the period November 2007 to March 2008 to coincide with the period that the Whooper Swans were present at Cruicetown.

In Wintering Survey Period 1, Tara Mines tailings ponds were only used intermittently throughout the study period with a maximum of 43 recorded in March 2008. However during the most recent study period, (Wintering Survey Period 2), the site has been more readily utilised with nationally significant

numbers (140). In addition reports by staff suggest that > 100 Whooper Swans have been regularly roosting on these ponds since the start of November 2008. Results this year tie in with findings made during the International Whooper Swan census carried out in January 2005, when 142 Whooper Swan (a nationally important number) were recorded at Tara Mines tailings ponds (Crowe *et al*, 2005). Furthermore, Robinson *et al*, noted that Tara Mines tailings ponds was used by Whooper Swans feeding in the Yellow River area, whilst Headford Estate is used by Whooper Swans feeding around Kells (Robinson *et al*, 2004). This indicates that these two roost sites have been known for some time and are capable of supporting nationally important numbers of Whooper Swans, if they are feeding in the locality.

None of these roost sites will be directly impacted by any of the proposed route corridor options.

Flightlines from Tara Mines tailings ponds, Whitewood Lough and potentially Clooney Lough area do cross route corridor option 3.

6 POTENTIAL IMPACTS

Route Corridor Option 1

The site at Carnaross which was used by Whooper Swans in March 2008 lies within this route corridor option, Black Lough, where Whooper Swans have been recorded in the past but not during the course of this study, lies just on the border of the route corridor option, and Breakey Lough lies within 1km of the route corridor option. All of the sites found within this route corridor appear to be used as stopover sites during the migration period and not as regular overwintering sites.

Whooper Swans have been recorded in the Carnaross areas in previous years but at a site that lies further to the west than the site where they were recorded this winter (2008). This suggests that there are a number of suitable fields in the Carnaross area and that Whooper Swans may switch sites depending on local conditions (availability of food, local disturbance). Numbers of Whooper Swans using these sites are generally low with the highest count recorded being the 19 Whooper Swans recorded at Carnaross.

Small numbers (5) were recorded at Breakey lough feeding beside the lake in November 2007 and October 2008 which suggests that this site is not regularly used.

It therefore seems that route corridor option 1 would lead to a minor or even neutral impact on wintering Whooper Swans in the area, although it is likely that mitigation measures through line marking would be required where the route crosses the river Blackwater to reduce the likelihood of Whooper Swans (including species other than Whooper Swans such as golden plover) colliding with the powerline.

Further studies are ongoing in the Breakey Lough and Carnaross areas to determine specific areas requiring line marking and the potential impacts on Whooper Swans.

Route Corridor Option 2

This route corridor option also includes the site at Carnaross and the site at Balgeeth where Whooper Swans have been recorded previously. Fordstown, Balrath, Barfordtown and Breakey Lough all lie within 1km of this route corridor option with Balrath and Breakey Lough being the only sites where Whooper Swans were recorded during Wintering Survey Period 2.

Whooper Swans were recorded three times at Balrath to date; during December 2007, November 2008 (when nationally significant numbers – 128, were present) and December 2008. Small numbers of Whooper Swans (max 5) were recorded twice at Breakey Lough in November 2007, March 2008 and October 2008.

As with route corridor option 1, it appears that the majority of sites that are found along this route corridor option are stopover sites, used on migration. Balrath appears to be an exception and appears to be a relatively important foraging and possible a roosting area at least during November 2007 and

December 2008, when forage material is available. Balrath is one of a cluster of sites in this area including Balgeeth, Barfordtown and Fordstown area that are currently being utilised or were used in the past. This suggests that there is a variety of sites available in this area for the Whooper Swans to use and again local conditions would dictate the sites that the Whooper Swans will use.

Mitigation measures in the form of line marking will probably be required at Carnaross and Balrath as a flightline was witnessed crossing this route corridor option at Balrath. Line marking may also be required around Balgeeth as these areas are used at least occasionally by significant numbers of Whooper Swans.

Further studies are ongoing in the Balgeeth, Balrath, Barfordtown and Fordstown area to determine specific areas requiring line marking and the potential impacts on Whooper Swans.

Route Corridor Option 3

In the southern and northern sections of the study area, route corridor option 3 forms a single route corridor, but in the middle section it forms two sub-options; 3a and 3b.

In the southern section, the route corridor option includes the feeding site at Teltown and the site at Tankardstown where Whooper Swans have been recorded previously. Tara Mines tailing ponds and the cluster of sites around the ponds lie approximately 2km to the east of this route corridor option.

A flightline was confirmed as also crossing this route corridor option near Donaghpatrick flying northwest up the Blackwater Valley probably to the Fyanstown, Sedenrath areas where Whooper Swans were noted later feeding. It is clear therefore that this route corridor option does have the potential to impact on feeding sites and the potential also exists for direct collision impacts as Whooper Swans fly in to roost and fly out again to feed from the Tara Mines tailings ponds and up the Blackwater Valley to feed.

Mitigation measures in the form of line marking may be required if this route corridor option is chosen. This will follow best practice following a review of relevant studies e.g. McKenzie Bradshaw (2006). Nationally important numbers of Whooper Swans were confirmed at Tara Mines tailing ponds in Wintering Survey Period 2 and previous studies such as Colhoun (2005) also recorded. Therefore careful mitigation design following best practice is required to minimise impacts on nationally important populations of Whooper Swans (and possibly golden plover) arising from the development of a powerline along this route option.

In the northern section, Newcastle Lough lies approximately 1.5 km to the east of the route corridor option. This site held seven Whooper Swans throughout Wintering Survey Period 1 and 10 Whooper Swans were noted in December 2008.

Route corridor option 3a is the western sub-option. No Whooper Swans were recorded in this route corridor option during the course of this study but it does contain the sites at Carlanstown and Emlagh

where Whooper Swans have been recorded in the past. Carlanstown had 142 Whooper Swans in February 2003.

Route corridor option 3b is the eastern sub-option. One site lies within the route corridor option itself, near Clooney Lough and was detected in December 2008. Further monitoring in Wintering Survey Period 2 will aim to determine flightlines here.

A second confirmed flightline between Cruicetown and Whitewood Lough crossed this route corridor option towards its northern end. If this route corridor option is chosen, then further studies should be undertaken to determine the level of impact that could occur as a result of this flightline crossing this route corridor option.

Further studies are ongoing in the Clooney Lough, Teltown, Tankardstown and Tara Mines tailing ponds areas to determine specific areas requiring line marking and the potential impacts on Whooper Swan

Conclusion

In conclusion, no flightlines were recorded crossing route corridor option 1, furthermore none of the sites associated with this route corridor option appear to be sites where Whooper Swans regularly spend the entire winter.

A flightline was noted crossing route corridor option 2 in the Balrath area. This area appears to be an important foraging area for numbers of Whooper Swans that can exceed nationally important levels.

Route corridor option 3 is crossed by two confirmed and one probable flightline. Two of these flightlines (one confirmed) crosses route corridor option 3b and not 3a.

Given, the importance of the Tara Mines tailing ponds roost site and the regular flightlines along the Blackwater Valley and the probable importance of the Whitewood Lough and the Cruicetown area to Whooper Swan numbers; this route corridor option can be concluded as likely to have the greatest level of potential impact on the wintering Whooper Swans.

Sites at Balrath and the Blackwater Valley area including Tara Mines tailing ponds hold nationally important numbers of Whooper Swans therefore the potential exists for impact on internationally important sites or Whooper Swans populations at route corridor options 2 and 3.

The mobile and dynamic feeding patterns of Whooper Swan in this area as they respond to local feeding conditions is obvious and will require further studies to definitively locate all potential areas where Whooper Swan may be at risk. This study is ongoing and will continue to at least April 2009.

7 RECOMMENDATIONS

Route corridor option 1 affects the least number of sites and flight lines, followed by route corridor option 2. Route corridor option 3 could potentially impact on the feeding site at Teltown and the flight line between the Blackwater Valley and Tara Mines tailings ponds. Additionally, route corridor option 3b will cross a feeding area close to Clooney Lough and the flight line between Cruicetown and Whitewood Lough.

If route corridor option 2 is selected, then further studies will be required in the Balrath area, as this area appears to be more important in Wintering Survey Period 2, compared to studies in Wintering Survey Period 1, with nationally important numbers recorded in November 2008.

If route corridor option 3 is chosen, then additional studies should be made into the level of activity at the three flightlines in order to assess the full level of any potential impact. Further studies on flightlines should particularly look at flight altitudes and mitigating factors such as adjacent tall trees. These studies should also assess the level of usage of the Blackwater Valley area and collect further data that allows a more accurate determination of Whooper Swans which are using the Blackwater Valley are roosting at Tara Mines tailings ponds.

For all route corridor options, mitigation measures in the form of line marking will be required in areas where Whooper Swans have been recorded and particularly where the flightlines cross the route. A review of how effective line marking can be in reducing bird collisions with powerlines was undertaken by McKenzie Bradshaw Environmental Consulting for the proposed Beauly to Denny 400kV overhead transmission line in Scotland (McKenzie Bradshaw 2006). Their review found that most studies undertaken have shown that line marking results in significant reductions in bird collisions. Their review cites a study undertaken by Bevanger (Bevanger 1994). In this study, Bevanger states that the use of natural features in siting of the powerline can aid in reducing collision by Whooper Swans, such as the base of cliffs or alongside rows of trees as these features would naturally cause the Whooper Swans to fly higher and over the wires. It must also be borne in mind that Whooper Swans fly to and from roosting sites in poor light and therefore powerline markers will need to be visible to the Whooper Swans in such conditions.

Haas *et al* also provide some general principles for protecting Whooper Swans 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.
- Attachment of clearly visible black-and-white markers on cables posing a high collision risk, particularly the earth cable of high voltage powerlines.

Therefore, consideration will be required regarding the design of pylons at points where flightlines cross the route corridor options, in order to reduce collision risk using the general principles outlined above.

Haas *et al.*, (2005) advocate the use of black and white markers on the earth cable to make it more visible to Whooper Swans. There are now a number of different products available. Further research will be undertaken to determine the best available line marker and spacing of such for avoiding collisions with Whooper Swans and possibly golden plover.

The use of such mitigation measures should ensure that the proposed overhead powerline does not significantly impact on the nationally important wintering population of Whooper Swans in this area.

This will require confirmation by undertaking further studies to determine the potential level of impact at individual sites where the proposed line would cross identified flight lines or feeding sites. This survey work is ongoing and will continue at least until the remainder of winter 2009 (April)

The impact of siting pylons within known feeding sites will need to be assessed on an individual site basis. In addition the availability of suitable alternative habitat close to existing feeding areas that could be used by the Whooper Swans will be determined.

The use of such mitigation measures, stated above should ensure that the proposed overhead powerline will not significantly impact on the nationally important wintering population of Whooper Swans.

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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 mention of Meath or Blackwater Valley

- 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
 - Irish wintering population of Whooper Swan is 12,730 further establishing Irish importance for Icelandic population. Meath population; 4 flocks totalling 97 Whooper Swans. Fig 1, shows point in Boyne Valley (Newgrange?) with a flock of 30-69. No information on movements of Whooper Swans within Boyne/Blackwater valley.

- 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 bewickii* 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. Meath population; 7 flocks totalling 252 Whooper Swans. Tara Mines tailings Ponds 142 Whooper Swans, nationally important (threshold is 130). No information on movements of Whooper Swans within Boyne/Blackwater Valley.

- 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. River Boyne identified as a nationally important site for moorhen (542) and river Blackwater (Meath) for Whooper Swan (241)

- 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.
- For Meath, the wintering bird sites that are located close to the proposed route corridor options are:
 - Tara Mines tailings ponds N840710, peak count of 46 Whooper Swan,
 - Clooney Lough, N830820, peak count of 50 Whooper Swan
 - Ballyhoe Lakes N850950, peak count of 45 Whooper Swan
 - River Boyne O007728 (Newgrange), peak count of Whooper Swan 58
 - Yellow River N842744, peak count of 10 Whooper Swan
- The species account ranks sites in their importance for wintering Whooper Swans. There are 13 sites of international importance (ie holding >1% of flyway population, threshold level is 210 Whooper Swans) and a further twelve of national importance (ie holding >1% of all-Ireland population, threshold is 130). The river Blackwater flock is of national importance with a five year mean of 182, making it the 15th most important site for Whooper Swan in Ireland. It is noted that the flock is not regularly monitored and that it is likely that numbers have remained at important levels.
- 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.
 - The main causes of death of Whooper Swan in Britain and Ireland are flying accidents (eg collisions with overhead powerlines).
 - Lists river Blackwater (Meath) as 43rd in GB and Ireland with a five year mean of 103.
 - Flocks have been recorded in a variety of locations including Grange (O7777), Emlagh (O7978), Sedenrath (O7675), Barfordstown (O7273) around Kells, and also along the Yellow River (N8377) between Tara Mines tailing ponds and Wilkinstown. The location of these feeding sites would suggest that Whooper Swans roost at the permanent waterbodies at Headford Estate (when feeding around Kells) and Tara Mines tailings ponds (from Yellow River feeding areas).



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