

**WINTER ORNITHOLOGICAL SURVEY LOT No.1:
MOUNTDILLON, DERRYAROGUE, DERRYADD, DERRAGHAN
(BY MALACHY WALSH & PARTNERS, 2015)**

A REVIEW OF SURVEY COVERAGE AND METHODS.

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1. Introduction

Malachy Walsh and Partners were commissioned by Bord na Mona to carry out surveys in the summer of 2015 at a number of sites on Bord na Mona land. Surveys covered a group of bogs near Lanesborough in counties Roscommon and Longford. The bogs surveyed were: Mountdillon, Derrycashel, Derryarogue, Derryadd, Lough Bannow, Derryaghan, Derryshanoge and Derrycolumb. These sites are being considered for the development of wind farms. Results from the 2014/15 winter surveys are presented in the report: Winter Ornithological Survey Lot No.1: Mountdillon, Derryarogue, Derryadd, Derraghan (Summer 2015) (Malachy Walsh & Partners, 2015)

ANIAR Ecology were contracted to review the methods used in the 2014/15 winter bird survey, with the following aims:

- To assess whether the current survey approach (coverage, methods) adequate to characterise the ornithological interest of the site.
- To establish whether the current survey approach adequate to assess the importance of the site for target species identified in the first year of survey (e.g. Whooper Swan, waders).
- To assess whether the current survey approach will generate sufficient and appropriate data for impact assessment including collision risk modelling?

2. Background

Bird surveys are used to inform the Environmental Impact Assessment (EIA) and Habitats Directive Assessment (HDA) process through:

- Site characterisation
- Identifying species of conservation interest (Red listed, Annex I, SPA connected)
- Gaining sufficient data to assess impacts; in this case collision, displacement, disturbance.
- Ensuring adequate survey approach and design to complete meaningful post construction monitoring.

Before survey work begins it is good practice to gather all existing data on the site and its hinterland. This data can be gathered from numerous sources including grey and published literature, websites and from people with local knowledge of the site. The existing data on the site together with an overview of the habitats present, gives some idea as to the species likely to be present and the most appropriate survey approach. The survey approach includes survey design, survey coverage (spatial and temporal) and survey methods and is required to provide baseline data on the site for:

- Site characterisation and to,
- Ensure coverage of potential target species

To ensure consistency in survey approach, standard survey methods are followed. Survey requirements in Ireland have largely been guided by those used in Scotland (SNH, 2014) where wind farm development is progressing rapidly. Other standard methods are followed for specific species groups e.g. raptors (Hardey *et al.*, 2013), breeding waders (Brown & Sheppard, 1993). National survey approaches also provides useful guidance specific to Ireland e.g. Hen Harrier Survey (Ruddock *et al.*, 2012).

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Survey approach and requirements are also informed by scientific literature e.g. the use of a 500m buffer arising from research into the disturbance effects of windfarms on upland breeding birds (Pearce Higgins, 2009).

While standard ecological guidance from the Irish Government is largely absent, survey approach is being formed through the decisions of An Bord Pleanála. Two recent decisions by the Bord (Adderloo Windfarm Report, October, 2015 and Meenbog Windfarm Report, March, 2016) have given some indication of the standard of survey design and approach that will be required to inform EIA and HDA. Some key points from these recent decisions are described.

2.1 ADDERROO WINDFARM

The Inspector reports states that, “Comprehensive survey work is necessary in order to create a detailed picture of bird distribution and flight activity and the usage of the development site by key bird species”..... and that.....“The survey data submitted, [therefore], fails to present a complete picture of the various bird species present at the site and their movements. This absence prevents a scientifically robust assessment of the site with regard to potential ornithological impacts”.

It is concluded in relation to the ornithological assessment that, “... the underlying methodology is inadequate with regard to the limited duration and extent of VP surveys at the development site and the lack of any dedicated surveys of significant waterbodies or potential roosting or feeding sites...”.

Concerns over the assessment of cumulative impacts with regard to barrier effects are also raised.

2.2 MEENBOG WINDFARM

The Inspectors report found that, the data in the EIS, “did not provide for a robust analysis of the usage of the site by key bird species”. The ecological baseline studies were considered to be “methodologically inadequate” and there was “essentially no reliable information of bird flight paths, foraging or breeding areas”.

There was “a serious issue with the methodology undertaken due to the visibility ranges from the selected Vantage Points and the coordinated use of these vantage points”. Further on this point it was found that, “No view shed analysis appears to have been carried out in order to show that flight paths as indicated can be scientifically validated. Viewsheds from each Vantage Point within different height bands are required in order to scientifically validate that flight lines area accurate and representative. Without viewshed analysis, the flight line data as provided is wholly inadequate”.

The scope of the survey work was also found to be lacking “having regard to the number of water bodies throughout the site and the potential for waterfowl. The failure to investigate the usage of the water bodies as a habitat for bird species of conservation concern and in particular the Whooper Swan and Greenland White-Fronted Goose” was considered by the Inspector to further invalidate any conclusions drawn in the EIS regarding collision risk and disturbance for these species

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Of importance for all wind farm survey work was the explicit endorsement by the Bord of the SNH Guidance as a measure of good practice. The Guidance provided by SNH is specifically referred to under the Flora and Fauna section of the Inspectors Report, where it is concluded that, “Most significantly, the survey methodology for bird species has not followed best practice by reference to Scottish Natural Heritage Guidance”

3. Scope of review

With reference to the above, the 2014/15 Winter Ornithological Survey Report prepared by Malachy Walsh & Partners (MWP Report), together with field of view maps and shapefiles of flight lines were reviewed. The results of this review are presented below under the following headings:

- Sourcing of existing data
- Survey coverage (spatial)
- Survey approach (VP watches and transect surveys)
- Coverage of target species
- Gaps in species coverage

Text shaded grey are statements of fact drawn from the 2014/15 Winter Ornithological Survey Report (hereinafter referred to as the MWP Report). All other text is comment and discussion arising from the review and relevant to the text shaded grey.

3.1. SOURCING OF EXISTING DATA.

The MWP Report (Winter) states that as part of the desk study, relevant bird records for the preceding 20 years, were gained from a number of sources; the main sources are then listed (Section 1.2). The results from this review of existing information are not presented as a discrete section of the Report, but are referred to during the discussion of results.

The sources of data reviewed by MWP are relevant to their assessment, however there are some additional and more recent sources of data which should also be reviewed.

Of considerable relevance for this site is its location adjacent to Lough Ree and the River Shannon (the MWP Report makes reference to the River Shannon as a flyway for wildfowl and waders). In this context it is important to present and use the most recent wintering bird data available, for example:

- Summary I-WeBs data is now available on the BirdWatch Ireland website and presents recent data for waterbirds including Whooper Swan and Greenland White-fronted Geese on Lough Ree, the River Shannon Callows and the River Suck Callows. Other wetland sites in the area are also likely to be present in the I-WeBs database.
- Boland and Crowe (2012) updates Crowe (2005) as a reference for the Status and Distribution of Irelands waterbirds.
- Robinson *et al.* (2004) provides the most recent review of the status of Whooper Swans in Ireland.

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- Results of the annual Greenland White-fronted Goose census are available from National Parks and Wildlife for the year 2013/2014 (Fox *et al.*, 2014) and contact with the local National Parks and Wildlife Service Conservation Ranger is likely to provide useful local knowledge regarding site use. The last monitoring report (Fox *et al.*, 2014) shows 165 Greenland White-fronted Geese on the River Suck Callows. The last count for north Lough Ree recorded 26 Greenland White-fronted Geese in 2011 (Fox *et al.*, 2012).
- The results of wintering bird surveys at other Bord na Mona sites are likely to be useful in providing data relevant to proposed development site. These reports should be reviewed for data on geese and swan feeding and roosting sites, which may be of relevance to the Derryadd site. Data for the wider area will also be important in terms of cumulative impact assessment.
- Surveys for other developments will be reported in other EIA's; this may provide useful additional information on the proposed development site and/or its wider area

3.2. SURVEY COVERAGE (SPATIAL)

From the MWP Report, although not stated, the survey area would appear to be solely the proposed development site. Surveys (VP watches and transects) focus on lands within the development site boundary. Section 3.3.12 refers to infrequent visits to the lakeshore of Lough Ree when a count of Whooper Swan was completed. Parts of the River Shannon were also visited where it lies adjacent to the development site. However there is no reference to, or methodology presented for, systematic surveys outside of the development site boundary.

The development site is the focus of the winter bird surveys. A further year of Vantage Point watches will be important in terms of establishing use of the development site. Surveys in Year 1 have shown the site is used by Whooper Swans. While not recorded during surveys in Year 1 Greenland White-fronted Geese are also present in the wider area (e.g. Lough Ree, River Suck). Both Whooper Swan and Greenland White-fronted Geese are vulnerable to collision, of conservation interest, and likely to be connected to SPA's. It will be important to establish any flock locations for these species within the local and regional area and their connection to the development site (flight paths, roosting and/or feeding sites). This will inform both the assessment of project specific and cumulative impacts.

3.2.1 Local connectivity.

Whooper Swan use fields and wetlands for feeding and roosting. There may be a roost site close to the development site which is regularly used by Whooper Swan and from which they commute to a number of feeding sites. Survey data for year 1 showed regular use of the development site by Whooper Swan. To establish if Whooper Swan feeding and roosting sites are present close to the proposed development and to inform the emerging picture of site use by Whooper Swan, surveys for feeding and roosting sites within approximately 5km of the development site should be completed each month. Where Whooper Swan (or Greenland White fronted Geese) flocks are identified, their feeding and roosting sites and their foraging range should be established through targeted watches. The foraging range of a flock may extend beyond the 5km survey area and where this occurs, the survey area should be extended to include the contiguous range. The priority is to gain a picture of geese and swan activity within 5km of the development site and where these flocks are connected to sites beyond 5km, this too should be established. With this data flight activity within the proposed development site can be given context; essential for the assessment of direct,

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indirect (i.e. where connectivity exists) and cumulative impacts. Surveys should take the form of I-WeBS point counts, recording flock location, activity (forage/roost) number and age (Adult/Juvenile). Where a flock has been located, follow up surveys at dawn and dusk should be completed to establish flight lines, roosting or feeding sites and foraging range.

Whooper Swan are a species of conservation interest for Lough Ree SPA. The location of this flock should be established and monthly counts undertaken (which could also be covered using aerial surveys). If surveys suggest a link between the Lough Ree flock and the proposed development site, dawn and dusk watches of the Lough Ree flock to establish foraging range may be required.

3.2.2 Regional Connectivity

The development site is located between a number of important wetland sites: the River Suck Callows, The River Shannon Callows, Lough Ree, Ballykenny Fishertown Bog. These sites are all SPA's and are important for Whooper Swan and for Greenland White-fronted Geese. A key element of the assessment must be to establish if there is any use of the development site by geese or swans connected to these sites. The most effective method to gain a picture of regional site use is by means of aerial survey. Three to four aerial surveys are recommended to cover the development site and an area of 20km around the site. This will provide context for data gained at the development site level, will aid in the survey and assessment of site of use at local level and will inform cumulative impact assessment. During aerial surveys all geese and swan flocks should be mapped, counted and feeding or roosting activity noted.

3.3. SURVEY APPROACH

3.3.1 VP survey

Fifteen Vantage Points were used by Malachy Walsh and Partners (MWP) to survey use of the site (flight lines and flight heights) by birds. From each VP 36 hours of watching was completed as recommended by SNH (2014). The dates of the watches are listed (MWP Report section 3.1) and cover the winter season, with monthly watches between October 2014 and March 2015. Field of view maps were prepared by MWP and show the field of view which could be observed from each VP; and therefore site coverage.

VP watches are used to:

- Assess the use of the site (site characterisation) and inform an evaluation of its importance (together with existing and historical data/information)
- Inform disturbance and displacement impact assessment
- Gather data with which to inform collision risk modelling

VP watches are the standard method used specifically for wind farm surveys. A number of points in relation to the application of this method at the development site are listed below.

3.3.1.1. Timing of VP watches

Winter VP watch and transect surveys by MWP covered the winter months from October 2014 through to March 2015.

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Standard survey coverage for the winter season is from October to March, as completed by MWP. Monthly surveys were completed over this period and give a sample of site use throughout the winter season. This is relevant and appropriate as the proposed development site lies adjacent to a number of sites use by wintering birds.

In addition and as stated in the MWP Report, the proposed development site is located on the River Shannon flyway for migratory waterbirds. As such, the site is likely to be important not just over the winter months, but also during Spring and Autumn migration. Where this is the case migration watches are recommended (SNH, 2014). These watches should target the key migration periods for Whooper Swan and Greenland White-fronted Geese in particular. The departure times of geese and swans from Iceland (Autumn migration) and from Wexford (Spring migration) can be sought and dawn and dusk surveys targeted for a 3-6 day period following departure. Without targeted surveys such as this, the question of site use during migration will remain unanswered. Site use and flight activity by geese and swans during migration will be important to establish, given their conservation status, SPA connectivity and the vulnerability of these species to wind turbine collision.

3.3.1.2 Coverage of 180 degree arc

SNH recommend that each VP should give the surveyor a 180 degree viewing arc over the site. The surveyor scans this 180 degree arc continuously; this is the survey area of the VP. The field of view maps show that some VPs cover more than a single 180 degree arc, however it is not clear if two watches are completed at the VP, or just one which covers views both ahead and behind. For future surveys it is important to ensure that each VP covers a single 180 degree arc, for 6 hours per month throughout the winter season. If a VP is covering views both ahead and behind the observer, then two VP watches at this location may be required.

3.3.1.3 Field of view maps

In addition to the provision of field of view maps, proper Viewshed analysis should be completed. This should take into account the combination of field of view and topography to allow the reader to clearly see what areas are visible to the observer. This analysis is also required to inform collision risk modelling.

3.3.1.4 VPs and site coverage

The field of view maps show that not all of the site is covered by the current VP locations. This means that there is no survey coverage to establish use for some parts of the site. The largest gap is between VP 13 and 14, but there is also an important gap between VPs 1, 2, 3 on the north side of the Shannon River and VPs 4, 5 and the south side. Additional VPs may be required to cover parts of the site which are not in view from any VP. Unless a rationale can be presented for not covering these areas (unsuitable habitat for example) then this is a weakness in the survey coverage

3.3.1.5 Coordinated counts

It is not clear from the information available (MWP Report section 3.1) if any watches were completed with coordinated count effort. It would be appropriate for sections of the site to be covered with coordinated count effort. Coordinating counting allows birds to be tracked and reduces error from double counting.

3.3.1.6 Flight height bands

The flight height bands used in the VP watches are too broad to be useful for collision risk modelling. The following bands are recommended by SNH: height below rotor sweep area, the rotor sweep area and above the rotor sweep area. Where the turbine dimensions are not known, the flight height should be assigned to specified height bands, as narrow as practical whilst ensuring observer accuracy. SNH Guidance (2014) advises that flight height within each band should be recorded every 15 seconds whilst the target species is in view. Given use of the site by Whooper Swan collision risk modelling will be required for this site. A consistent, and as far as practical, detailed approach to flight height assessment will be essential to inform this assessment.

3.3.2 Transect surveys

3.3.2.1 General winter birds

Transect surveys were completed in November 2014 and again in March 2015. Twenty three transects were surveyed. Forty six species were recorded during the transect surveys. Most species recorded were passerines, but waders, raptors and Whooper Swan were also recorded.

Transect surveys are important to assess site use by passerines. Roosting flocks of Golden Plover may also be picked up during transect surveys as well as roosting Whooper Swans, where the wetland may not be visible from a VP.

It is important that transects covered in year 1 are covered again in year 2. The data can then be used to confirm year 1 results and to provide a more robust baseline data set, from which to monitor change. It is noted that the wintering bird community will change with habitat change and this variable should be considered in any monitoring data, especially given the transitional nature of habitats present on the site.

The transect survey approach, coverage and timing appears to be adequate for the site and species concerned. However, grid co-ordinates should be provided for the exact route of each transect. Ideally, transects should follow a defined land-mark to ensure accurate repeatability. Where extra transects are added for breeding season coverage, these should also be covered during the winter season.

3.4. TARGET SPECIES

The MWP report presents data for one year of winter surveys and has established that the site is used by waterfowl, raptors and passerines. Use of the site by a number of target species (species of conservation interest and/or SPA connected species) was also shown.

3.4.1. Whooper Swans

The MWP Report shows that Whooper Swan were recorded using the site throughout the winter. Most observations were of Whooper Swan commuting or flying through the site; however on two occasions swans were recorded roosting within the site. Flight activity and site use linked to the River Shannon and Lough Ree and to man-made ponds in the north of the development site was noted.

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As described above (Section 3.1, 3.2 and 3.3.1.6) use of the development site by Whooper Swans requires additional context based on existing data and based on new survey data gained at local (5km or more from the development site and including the Lough Ree flock) and regional (20km from the development site) levels. This will enable flight activity within the development site, by Whooper Swan to be explained and SPA connectivity assessed.

It will also be important to ensure detailed flight height data (3.3.1.6) is available for collision risk modelling, as this will be an important element of the impact assessment (see below).

3.4.2 Golden Plover

The MWP report describes use of the development site by roosting and commuting Golden Plover during October, November and March.

VP watches and transect surveys repeated in Year 2 will provide additional data on site use by Golden Plover. If flight height data is assigned to smaller flight height bands (3.3.1.6) this will allow more accurate collision risk assessment for this species. No alterations to surveys for this species are considered necessary.

3.4.3. Hen Harrier

The MWP Report describes use of the development site by foraging, hunting, commuting and roosting Hen Harrier during October, December and March.

VP watches and transect surveys repeated in Year 2 will provide additional data on site use by Hen Harrier. If flight height data is assigned to smaller flight height bands (3.3.1.6) this will allow more accurate collision risk assessment for this species. No alterations to surveys for this species are considered necessary.

3.4.4 Other species of conservation interest

A number of Red-listed species were recorded during VP watches (Black headed Gull, Lapwing, Herring Gull, Grey wagtail, Curlew, Meadow pipit). These species will be adequately surveyed during Year 2 with the continuation of VP watches and transect surveys.

3.6. GAPS IN SPECIES COVERAGE

3.6.1 Waterbird activity during migration.

It is likely that there is a movement of birds through the proposed development site during Spring and Autumn migration. The proposed development site is located between wetlands to the north and to the south. There is little available data on migration routes within Ireland, however they are known to follow water bodies and some waterbirds may well move down from Irelands northern coast through various wetlands including Lough Ree to winter on wetland sites such as the River Shannon or River Suck callows. Given the potential scale of this development and the potential for cumulative impacts (increasing number of wind farms planned and proposed for the midlands area) the risk of collision to migrating water birds is likely to become significant. While it is argued that migratory waterbirds fly above the tip height of turbines, data is limited. Griffin *et al.*, (2011) found that during migration Whooper Swans were found to fly overland at a mean flight height of 10 m (+/- 9m) above ground with a median height of 42 m.

3.5.2 Greenland White-fronted Geese

Greenland white-fronted Geese are an Annex I species, and are species of Special Conservation Interest at the Ballykenny Fishertown Bog SPA and the River Suck Callows SPA. Outside of counties Donegal and Wexford where the majority of Ireland's white-fronted geese winter, the River Suck is of considerable importance, with only three other sites supporting flocks of over 100 geese. Lough Ree is also known to support a small flock of Greenland White –fronted Geese. Further data on use of Lough Ree by Greenland White –fronted Geese (number and location of traditional feeding and roost sites) is required. Continued and additional VP watches during Spring and Autumn migration, together with local (including traditional sites on Lough Ree) and regional surveys will provide data on use of the development site by this species during both the winter and migration periods.

3.5.3 NIGHT SURVEYS

Movement of birds through the site during the hours of darkness, particularly during the spring and autumn migration periods, should be assessed and the use of bird detection radar should be considered.

4. Conclusion

A number of gaps in the Year 1 winter season survey approach have been identified and can be addressed as follows:

4.1 EXISTING DATA

- Review additional sources of existing data. This will help to target Year 2 surveys and to give additional context to Year 1 data.

4.2 SURVEY COVERAGE – LOCAL

- Survey suitable habitat within 5km of the proposed development site for swans and geese. Where flocks are identified, the foraging range of these flocks should be established with dawn and dusk watches. Where this range extends beyond the 5km local survey area, surveys outside of this area will be necessary. Monthly surveys over the winter should be completed.
- Complete monthly counts of Lough Ree to monitor site use by geese and swans and to assess any link between these flocks and the development site. Local knowledge and survey work will establish regularly used feeding and roost sites by these species.

4.3 SURVEY COVERAGE – REGIONAL

- Complete aerial surveys within c.20km of the proposed development three to four times over the winter season. This will provide a picture of goose and swan flock locations relative to the proposed development site, necessary to inform assessment of project level and cumulative impacts.

4.4 VP SURVEYS

- Complete additional VP watches during Spring and Autumn migration.
- Improve VP coverage of site. Additional vantage points may be required to cover areas not viewed by current VPs (as shown by field of view maps).
- Ensure that each VP is used to cover a single 180 degree arc only. If a 6 hour watch in Year 1 was used to cover a survey area greater than a single 180 degree arc, this will have to be amended for Year 2. This will have implications for number of VPs and the number of survey days required.
- Complete coordinated counts of sections of the site (e.g. either side of River Shannon).
- Record flight heights at intervals which reflect: height below rotor sweep area, the rotor sweep area and above the rotor sweep area. Current intervals are too broad.
- Complete view shed analysis. This should be done to reflect ground level view shed and at 30m and 50m bands, which are potential lower sweep-zone heights of typical turbines.

4.5 GAPS IN SPECIES COVERAGE

- Additional summer transect to be also completed during the winter season
- Transect route should be repeatable.

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4.6 GAPS IN SPECIES COVERAGE

- Use of the site (commuting, roosting) by migratory birds and specifically by Greenland White-fronted Geese should be established. Additional surveys detailed above will be relevant to these species.
- Assessments of bird interest during the hours of darkness should be made, particularly during the spring and autumn migration periods.

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