



Bord na Móna

Derryadd Proposed Wind Farm

Winter Bird Surveys and Evaluation Report 2017/ 2018

May, 2018

TOBIN CONSULTING ENGINEERS



WINTER BIRD SURVEYS AND EVALUATION REPORT 2017/ 2018

PROJECT: **Derryadd Proposed Wind Farm**

CLIENT: **Bord na Móna**
Main Street,
Newbridge,
County Kildare

COMPANY: **TOBIN Consulting Engineers**
Block 10-4
Blanchardstown Corporate Park
Dublin
Ireland
T +353 1 8030401
F +353 1 803 0409
email: dublin@tobin.ie

www.tobin.ie

Client: Bord na Móna

Project: Derryadd Proposed Wind Farm

Title: Winter Bird Surveys and Evaluation Report 2017/ 2018

PROJECT NUMBER: 10364				DOCUMENT REF: 10364 Derryadd Winter Bird Surveys 2017 2018			
Revision	Description & Rationale	Originated	Date	Reviewed	Date	Authorised	Date
A	Winter Bird Surveys and Evaluation Report	PC	18/05/18	DG	30/05/18	DG	30/05/18
TOBIN Consulting Engineers							

Derryadd Proposed Wind Farm
Winter Bird Surveys and Evaluation Report 2017/ 2018

TABLE OF CONTENTS

1	INTRODUCTION	1
2	METHODOLOGY	2
2.1	DESK STUDY	2
2.2	SURVEY METHODS	3
2.2.1	<i>Vantage Point Surveys.....</i>	3
2.2.2	<i>Winter Birds Walkover Survey.....</i>	4
2.2.3	<i>Hen Harrier Roost Survey</i>	5
2.2.4	<i>Irish Wetland Bird Survey (I-WeBS)</i>	5
3	BASELINE ORNITHOLOGICAL INFORMATION	6
3.1	DESK STUDY	6
3.1.1	<i>Designated Sites.....</i>	6
3.1.2	<i>Bird Atlas 2007-2011.....</i>	7
3.1.3	<i>BirdWatch Ireland Bird Sensitivity to Wind Energy Developments.....</i>	8
3.2	FIELD SURVEY	8
3.2.1	<i>Key Species of Conservation Significance</i>	10
4	EVALUATION	18
4.1	DESK STUDY EVALUATION	18
4.2	FIELD STUDY EVALUATION.....	19

Index of Tables

Table 2.1:	Locations where I-WeBS survey were conducted	6
Table 3.1:	Special Protected Areas within a 15km radius of the proposed development area, with information on approx. distance from the propose development area.....	7
Table 3.2:	Distribution of key species of conservation concern found within the wider surroundings of the proposed development area (N05, N07, N06, N16, N17).....	8
Table 3.3:	Details the full species list for the winter bird surveys 2017/ 2018.....	9

Index of Figures

Figure 2.1:	Vantage Point and Transect Locations for the Winter Bird Surveys 2017/18	5
-------------	--	---

Appendices

APPENDIX NO. 1	Derryadd Flight Line Maps
-----------------------	---------------------------

1 INTRODUCTION

The site consists of the three bogs Derryarogue, Derryadd and Lough Bannow, which are under consideration for a large-scale wind farm development. The three bogs have a total area of approximately 2,300 hectares and are located in an area generally circumscribed by the towns and villages of Lanesborough, Derraghan, Keenagh, Killashee, and the River Shannon. The surrounding landscape is a mixture of forestry, agricultural land and cutaway peatland, and is predominantly flat. A number of scattered domestic dwellings are located along the local roads surrounding the site. The site is in commercial peat production with some areas of regenerating cutaway bog, comprising birch/willow scrub and areas of more open, dry heather and a few pools and drains. In addition, there are some active turf cutting around the margins of the site which contain bare peat areas. This Bog Group is almost entirely surrounded by a cluster of similar bogs within the Moundillon group and farmland. The River Shannon flows just less than 1 km to the north-west of Derryarogue bog.

The proposed development area (within the planning/ development (red line) boundary), and key habitats two a 5 km radius from the planning/ development boundary make up the study area.

This report has been prepared to provide information on the key bird species encountered within the study area and to evaluate the potential for ecologically significant effects to result from the proposed development. Details of the desk study undertaken and resulting methodologies employed for the investigation of baseline conditions within the study area can be found in Section 2. Section 3 details the key findings, by location and survey method. In the final section (Section 4), an evaluation is made on the potential for ecologically significant effects on avian communities identified within the study area. Any potential impacts are assessed in a regional, national and international context, as appropriate. This report has been created to present the findings of the winter bird surveys (2017/ 18) in a format which allows for comparisons between survey seasons.

This report has been completed by Mr. Pdraig Cregg (BSc Zoology: National University of Ireland Galway, MSc Evolutionary and Behavioural Ecology: University of Exeter), Senior Ornithologist with TOBIN Consulting Engineers. The author is appropriately experienced and capable of undertaking this assessment having worked on over 30 wind farm projects in both the UK (Scotland) and Ireland. Field surveys were carried out (October 2017 to March 2018) by Alan Booth (Ornithologist), Kevin Delahunty (Ecologist) and Shane Cully (Independent Ornithologist).

2 METHODOLOGY

2.1 DESK STUDY

A desktop review of published (including bird atlas records) and unpublished literature sources and existing datasets (records held on the National Biodiversity Data Centre (NBDC)) and BirdWatch Ireland was undertaken for key species of conservation concern. Target species selection and survey design were undertaken following consideration of the desk study and based on the typical bird communities likely to be found within the habitats of the study area. The following key reference sources and datasets were consulted during desktop studies:

- Barton, C., Pollock, C., Norriss, D.W., Nagle, T., Oliver, G.A. and S. Newton (2006). *The second national survey of breeding Hen Harriers (Circus cyaneus) in Ireland 2005*. Irish Birds 8: 1-20.
- Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. (2013) *Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland*. BTO Books, Thetford.
- BirdWatch Ireland (2010) *Action Plan for Upland Birds in Ireland 2011-2020*. BirdWatch Ireland's Group Action Plans for Irish Birds. BirdWatch Ireland, Kilcoole, Co. Wicklow
- Boland, H. & Crowe, O. (2012) *Irish Wetland Bird Survey: Waterbird Status and Distribution 2001/02 - 2008/09*. BirdWatch Ireland, Kilcoole, Co. Wicklow.
- Boland, H., Tierney, N. & Crowe, O. (2014). *Irish Wetland Bird Survey: Results of Waterbird Monitoring in Ireland in 2012/13*. BirdWatch Ireland.
- Boland, H., McElwaine, J.G., Henderson, G., Hall, C., Walsh, A. & Crowe, O. (2010). *Whooper Cygnus cygnus and Bewick's C. columbianus bewickii Swans in Ireland: results of the International Swan Census, January 2010*. Irish Birds, 9(1), pp.1–10.
- Colhoun, K. & Cummins, S. (2013). *Birds of Conservation Concern in Ireland 2014 – 2019*. Irish Birds, 9(4), pp.523–544.
- Copeland, A. (2011) *Birds on Cutaway Peatlands: Baseline Breeding Bird Population Survey*. Project Report 2011. Unpublished report for Bord na Móna
- Crowe, O. (2005) *Ireland's Wetlands and their Waterbirds, Status and Distribution*. BirdWatch Ireland, Newcastle, Co. Wicklow.
- Fox, A.D., Norriss, D.W., Stroud, D.A. & Wilson, H.J. (1994). *Greenland Whitefronted Geese in Ireland and Britain, 1982/83-1993/94*. The first twelve years of international conservation monitoring. Greenland White-fronted Goose Study and National Parks & Wildlife Service, Dublin.
- Gilbert *et al.*, (1998) *Bird Monitoring Methods: A manual of techniques for UK species*.
- Hardey, J. *et al.*, (2013) *Raptors: A field guide for surveys and monitoring*.
- Hutchinson, C.D. (1979) *Ireland's Wetlands and their Birds*. Irish Wildbird Conservancy, Dublin.
- Sheppard, R. (1993) *Ireland's Wetland Wealth*. Irish Wildbird Conservancy, Dublin.
- Crowe, O. & Holt, C. (2013) *Estimates of waterbird numbers wintering in Ireland, 2006/07-2010/11*. Irish Birds 9: 545-552.
- Gibbons, D.W., Reid, J.B. and R.A. Chapman (1993) *The New Atlas of Breeding Birds in Britain and Ireland: 1988-91*. T & A.D. Poyser, London.
- Hall, C., Glanville, j., Boland. H., Einarsson, O., McElwaine, G., Holt, C. A. & Rees., E.C. (2012). *Population size and breeding success of Icelandic Whooper Swans Cygnus: results of the 2010 international census*. Wildfowl, 62, pp.73–96.
- Lack, P. (1986) *The Atlas of Wintering Birds in Britain and Ireland*. T. & A.D. Poyser, Calton.

- Moran, P. & Wilson-Parr, R. (2015) *Hen Harrier Special Protection Area (SPA) Habitat Mapping Project 2014. Irish Wildlife Manuals, No. 83.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- McGuinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S., & Crowe, O. (2015). *Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland.* BirdWatch Ireland.
- NPWS, (2015) Hen Harrier Conservation and the Forestry Sector in Ireland. Report prepared by NPWS to inform the Hen Harrier Threat Response Plan (HHTRP) Version 3.2. 1-50.
- O'Connell, P. (2011) Action Plan for Lowland Farmland Birds in Ireland 2011-2020. BirdWatch Ireland, Unit 20, Block D, Bullford Business Campus, Kilcoole, Co. Wicklow.
- Ruddock, M. & Dunlop, B.J., O'Toole, L., Mee, A., Nagle, T. (2012) *Republic of Ireland National Hen Harrier Survey 2010. Irish Wildlife Manual, No. 59.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Scottish Natural Heritage (SNH) (2014). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage;
- Sharrock, J.T.R. (ed.) (1976) *The Atlas of Breeding Birds in Britain and Ireland.* T. & A.D. Poyser
- Scottish Natural Heritage (SNH) (2014). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage.
- SNH (2016) *Assessing Connectivity with Special Protection Areas (SPAs).* Scottish Natural Heritage.
- Wilson, M., Gittings, T., O' Halloran, J., Kelly, T., and J. Python (2006). *The distribution of Hen Harriers in Ireland in relation to land use cover, particular forest cover.* Coford, Environment no. 6.
- www.birdwatchireland.ie – Distribution map of I-WeBS sites in Ireland
- www.nbdc.ie – Bird distribution data (10km hectad squares)
- www.npws.ie – Distribution maps and associated information for sites designated for nature conservation by NPWS (i.e. SPAs, SACs, NHAs, pNHAs)
- IWeBS (2015) <http://f1.caspio.com/dp.asp?AppKey=f4db3000060acbd80db9403f857c>. Irish Wetland Bird Survey (IWeBS) Records.
- Map of Irish Wetlands (2015) - www.WetlandSurveysIreland.com.

2.2 SURVEY METHODS

Survey methods were selected based on the evidence of the desk study and after consideration of previous survey results. The survey methods aimed to principally target species of conservation concern, with particular reference to wintering/ migratory water birds and raptors.

2.2.1 Vantage Point Surveys

Vantage point surveys aim to quantify the level of flight activity and its distribution over the survey area. The primary purpose of the survey is to provide data to inform the collision risk model. This analysis makes predictions on the probability of mortality, resulting from birds colliding with operating turbines. Vantage points are fixed locations that are strategically positioned to provide a maximum view shed of the survey area from a minimum number of locations. The surveyed area should include the entire wind farm envelope where turbines may be positioned and should extend to a 500m radius from the outermost turbines. The view shed of a given vantage point should extend to a distance of no greater than 2km and include an arc of no greater than 180 degrees, as per SNH (2014). Vantage point watches were conducted from twelve vantage points. The location of each vantage point is mapped in Figure 2.1 below.

The vantage point methodology followed guidelines issued by the Scottish Natural Heritage (SNH) (2014) - *Recommended bird survey methods to inform impact assessment of onshore wind farms*. The minimum

requirement of 36 hours per vantage point per season (breeding and non-breeding) was achieved. The timing of watches was tailored to the ecology of the target species present on site, including dawn, day and dusk surveys. Field information recorded included; dates, vantage point location, weather, survey start and end time, species observed, time of observation, number of individuals per observation, height of flight, duration of flight, reference number to flight line. All flight lines of target species were mapped on field sheets. Behavioural observations were also recorded.

Birds that use the airspace around turbines are susceptible to collision with operating turbines. The swept area of the rotor blade is the area in which a collision is theoretically possible. Possible collision height (PCH) is therefore defined as the area of space occupied by the turbine rotors. PCH will vary between wind farms and with the specification of the manufacturer. At Derryadd PCH was considered to be within the height band of 30-175m¹ above ground level. Three height bands were used by surveyor to characterise flight height, below PCH, at PCH and above PCH.

2.2.2 Winter Birds Walkover Survey

A transect survey follows a defined linear route through a specific area. To achieve maximum coverage of suitable habitat, several routes may be needed. The transects covered a large and representative portion of the survey area. The location of each transect is mapped in Figure 1 below. The transect surveys were walked at a standard speed. Notes on aural and visual registrations of bird species were recorded during field surveys. Visual registrations were recorded with the aid of binoculars (e.g. 8 x 42) and if necessary, with the aid of a telescope (e.g. 20-45 x 60 Scope). Particular emphasis was paid to waders in areas of bare peat and other target species.

Winter season surveys were conducted between October and March (2017/ 18). Birds present were recorded by sight and song/ call. For all species, every effort was made to minimise disturbance risks that might be caused by the human intrusion associated with undertaking the survey. The surveyor regularly stopped to allow rapid detection of species presence.

Where access allowed, an adapted Brown and Shepherd (1993)² surveys was employed in suitable habitat for winter birds. Brown and Shepherd (1993) methods are suitable for surveying many upland and open country species. Suitable habitat for waders includes wet grassland, marsh, fens, river valleys, raised bog, degraded raised bog, cutover bog and blanket bog.

Raptor activity was also noted during the course of transect surveys. All areas of suitable habitat on site were investigated for aural or visual registrations and/ or physical signs (feathers, pellets, prey remains or white washing) on prominent features in the landscape. The location of any (early) breeding behaviour was noted for further future investigation.

The timing of watches was tailored to the ecology of the target species present. Field information recorded included; dates, location, weather, survey start and end time, species observed, time of observation, number of individuals per observation, reference number to flight line. All flight lines of target species were mapped on field sheets. Behavioural observations were also recorded.

The aim of this survey was to establish the distribution and abundance of birds within the proposed development area.

¹ This height is based on predictions of turbine tub heights and rotor blade lengths.

² Brown, A. F. and Shepherd, K. B. (1993). A method to survey upland breeding waders. *Birds study* 40: 189-195.

2.2.3 Hen Harrier Roost Survey

Hen Harrier Roost Surveys were conducted where suitable roosting habitat was found onsite or within the wider surroundings of the proposed development area. The proposed development traverses one 10 km grid squares with known Hen Harrier roosts: N07 (NPWS 2013). Hen Harrier roost vantage points were located in some instances in adjacent 10 km grid squares, depending on the location of suitable roosting habitat relative to the proposed development. Two vantage points were selected in the hinterland of the site: the first at Moundillon bog (N07) and the second at Derryglash bog (N06). Hen Harriers may roost communally in winter, generally in rank ground vegetation (Clarke and Watson 1997)³. Suitable roosting habitat is typically restricted to dense vegetation, such as heather or young commercially planted conifers. Although this species breeds in upland areas, wintering birds disperse widely and can frequently be found in lowland areas of the midlands of Ireland. Hen Harrier Roost Surveys were conducted at the two locations mentioned above, between October 2017 and March 2018.

Hen Harrier Roost Survey methods followed those set out by Gilbert *et al.* (1998) and were in accordance with the NPWS National Winter Hen Harrier Roost Survey recommendations (Ruddock *et al.* 2016). Surveyors were in place an hour and a half before sunset and all observations of Hen Harrier were recorded until last visible light. Information recorded by surveyors from the vantage points included; the number of Hen Harrier entering a roost, the time, age, and sex, where possible.

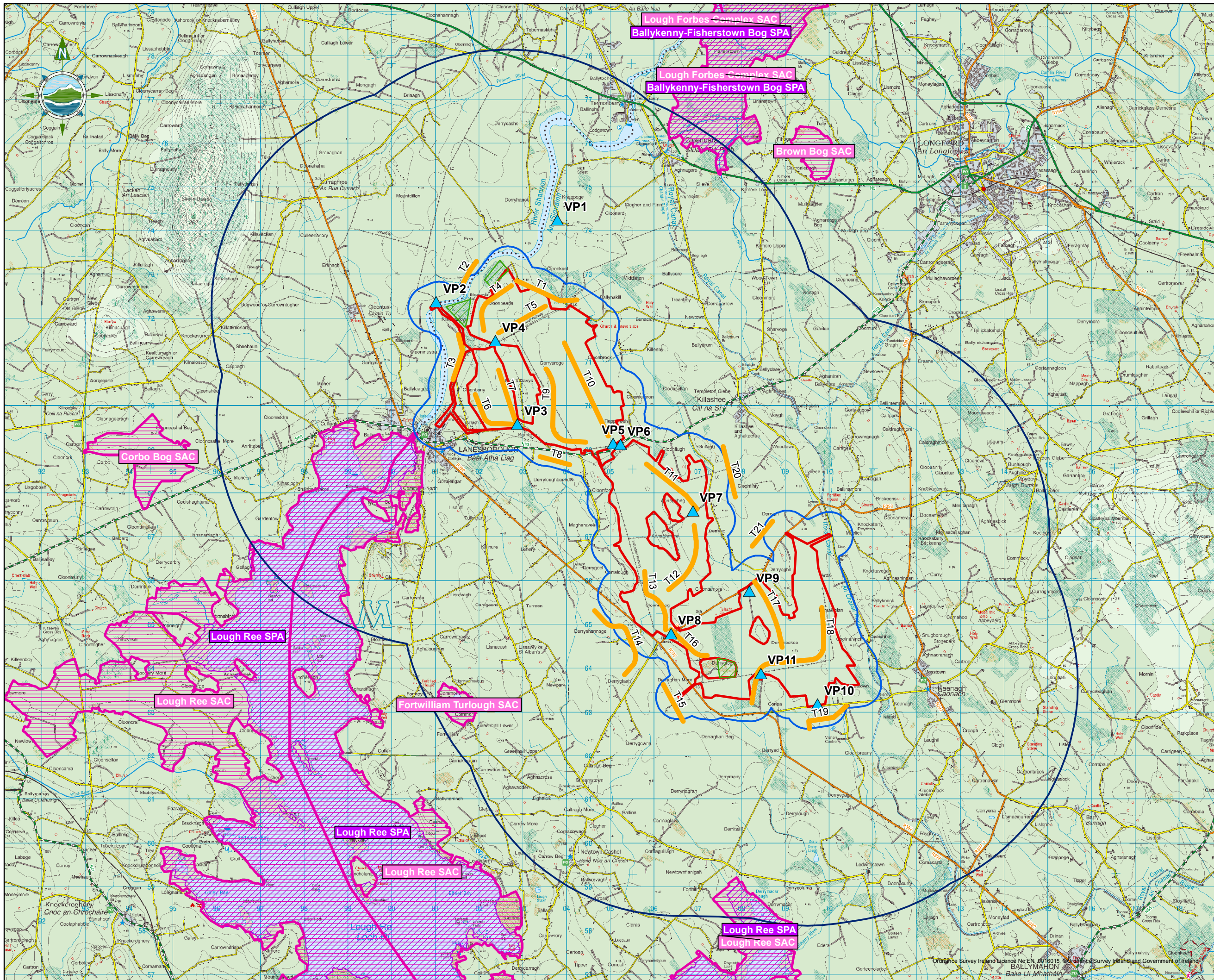
2.2.4 Irish Wetland Bird Survey (I-WeBS)

Bimonthly counts (October 2017 to March 2018) were conducted at wetland water bird sites during daylight hours (ideally at dawn or before dusk) from suitable vantage points using binoculars and/ or telescope as required. Information collected included, numbers of breeding wildfowl or wader species, the presence of marked birds (leg-ringed or neck-collared), weather conditions and habitat types were noted. Survey methodology followed the 'I-WeBS Counter Manual – Guidelines for Irish Wetland Bird Survey Counters' co-ordinated by BirdWatch Ireland. The area surveyed included the hinterland of the site to a 5km radius from the planning/ development boundary. Particular attention was paid to wintering aggregations of Little Grebe, Whooper Swan, Wigeon, Teal, Mallard, Shoveler, Tufted Duck, Goldeneye, Coot, Golden Plover and Lapwing, which are among the qualifying interest of the nearby Lough Ree SPA. The area surveyed is detailed in Table 2.1 below.







³ Clarke, R., & Watson, D. (1997). The hen harrier winter roost survey. *Raptor*, 24, 41-45.

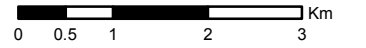
Table 2.1: Locations where I-WeBS survey were conducted

Site Number	Location	Coordinates
Derryadd IWeBS 1	Carramagrine	53.758321, -7.900860
Derryadd IWeBS 2	Tarmonbarry Bridge	53.742084,-7.917675
Derryadd IWeBS 3	Tarmonbarry Lock	53.738477, -7.919023
Derryadd IWeBS 4	Roadside overlooking channel near Tarmonbarry.	53.739119, -7.950945
Derryadd IWeBS 5	VP2; BnM Bridge overlooking Shannon	53.700619, -7.984764
Derryadd IWeBS 6	Lanesboro bridge	53.674084, -7.992305
Derryadd IWeBS 7	Ballyleague Harbour	53.673186, -7.997639
Derryadd IWeBS 8	Roscommon Road	53.675409, -8.020767
Derryadd IWeBS 9	Portnahinch	53.640150, -8.058257
Derryadd IWeBS 10	Hilltop	53.650517, -8.008101
Derryadd IWeBS 11	Hilltop (South)	53.638666, -8.010220
Derryadd IWeBS 12	Bleanavoher	53.630096, -8.013299
Derryadd IWeBS 13	Aghakeel	53.615693, -8.010796
Derryadd IWeBS 14	Fortwilliam Turlough	53.618299, -7.972853
Derryadd IWeBS 15	Carpark near Elfeet	53.588660, -7.969472
Derryadd IWeBS 16	Saints Island	53.555641, -7.893837
Derryadd IWeBS 17	Saints Island	53.557622, -7.883667
Derryadd IWeBS 18	Derrynagalliagh	53.562513, -7.866884



Legend

-  Vantage Points
-  Transect
-  Woodcock Survey
-  Site Boundary
-  Site Boundary 500m buffer
-  Site Boundary 5km buffer



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	MAY-16	Proposal Issue	M.K	AA

Client:



Project:

Derradd Windfarm

Title:

Vantage Point and Transect Locations for the Winter Bird Surveys 2017/18

Scale @ A3: 1:80,000

Prepared by: M.Kabza Checked: A.Austin Date: May 2016

Project Director: D. Grehan



Consulting, Civil and Structural Engineers,
 Block 10-4, Blanchardstown Corporate Park,
 Dublin 15, Ireland.
 tel: +353-(0)1-8030406
 fax: +353-(0)1-8030409
 e-mail: info@tobin.ie
 www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. All copyright held except as agreed for use on the project for which the document was originally issued.

Figure 2.1

Issue: A

3 BASELINE ORNITHOLOGICAL INFORMATION

3.1 DESK STUDY

The desk study aimed to collect information on the distribution and abundance of certain key bird species within the study area and the wider surroundings. The Wildlife Act 1976 is the principle national legislation providing for the protection of birds in Ireland. In a European context, certain birds are afforded additional protection under Annex I of the European Union (EU) Birds Directive (79/409/EEC, amended 2009/147/EC). Of the 500 species of wild bird which occur in Europe 194 species and sub-species are particularly threatened. Member States must designate Special Protected Areas (SPAs) for their protection and all migratory birds. In Ireland bird species are also classified as red (conservation priority), amber (lesser priority) or green (least priority) status by the Birds of Conservation Concern in Ireland (BoCCI) report, 2014-2019 (Colhoun and Cummins, 2013). This traffic light system places species in one of three categories, as an understandable mechanism to identify conservation priority. A species is classed as red listed if it fulfils one of the following criteria, their breeding range or population has declined by more than 50% in the last 25 years, their breeding population has undergone significant declines since 1990, or the species is of global conservation concern. Key species from the above listed may be subject to targeted surveys where they occur.

Target species were identified as species sensitive to this type of development. They are species listed on Annex I of the EU Birds Directive (79/409/EEC)⁴ and birds listed as being of high (Red listed) and medium (Amber listed) conservation concern (as identified by Colhoun and Cummins (2013)). Consideration is also given to common species which have been identified as relatively sensitive to potential impacts from this type of development. In addition, target species were selected from those species which made up the qualifying interest of local Special Protected Areas.

3.1.1 Designated Sites

There are no sites designated under the EU Habitats Directive and EU Birds Directive, i.e. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), located within the footprint of the proposed development area. The nearest SPAs are Lough Ree SPA to the west and Ballykenny-Fisherstown Bog SPA to the north.

⁴ The species listed in Annex I of the EU Birds Directive are those in danger of extinction, rare, vulnerable to specific changes in their habitat requiring particular attention for reasons of the specific nature of their habitat.

Table 3.1: Special Protected Areas within a 15km radius of the proposed development area, with information on approx. distance from the propose development area

Site	Conservation Interest/ Noteworthy Species
Lough Ree SPA 004060 0.75km	Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Mallard (<i>Anas platyrhynchos</i>) [A053] Shoveler (<i>Anas clypeata</i>) [A056] Tufted Duck (<i>Aythya fuligula</i>) [A061] Common Scoter (<i>Melanitta nigra</i>) [A065] Goldeneye (<i>Bucephala clangula</i>) [A067] Coot (<i>Fulica atra</i>) [A125] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Common Tern (<i>Sterna hirundo</i>) [A193] Wetland and Waterbirds [A999]
Ballykenny-Fisherstown Bog SPA 004101 4.67km	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]

3.1.2 Bird Atlas 2007-2011

The Bird Atlas project aimed to map the distribution and abundance of wintering and breeding birds across Ireland and Britain. Surveying was conducted by a network of volunteers from November 2007 to July 2011. The data was then published in 'Bird Atlas 2007-11, the breeding and wintering birds of Britain and Ireland (Balmer *et al.*, 2013). A review of Bird Atlas 2007-2011 distribution maps was made for certain key species of conservation concern. This map data can be access at the Bird Atlas Map Store (<https://app.bto.org/mapstore/specieschooser.jsp>). Records for the 10km grid square (N07, N06, N16) in which the site is found and wider surroundings (N05, N17) is presented in Table 3.2 below.

The absence of a breeding record from a given 10km grid square does not confirm that breeding did not occur. Nor does the absence from a 10km grid square confirm that the species cannot be found locally.

Table 3.2 details the distribution of key species of conservation concern found within the wider surroundings of the proposed development area (N05, N07, N06, N16, N17), as per Bird Atlas 2007-2011 distribution maps.

Table 3.2: Distribution of key species of conservation concern found within the wider surroundings of the proposed development area (N05, N07, N06, N16, N17)

Species	Non-breeding/ Wintering	Breeding	Conservation Status
Whooper Swan	Present	Absent	Annex I (EU Birds Directive), Amber Listed (BoCCI)
Wigeon	Present	Absent	Red Listed (BoCCI)
Shoveler	Present	Probable	Red Listed (BoCCI)
Pochard	Present	Absent	Red Listed (BoCCI)
Tufted Duck	Present	Probable	Red Listed (BoCCI)
Goldeneye	Present	Absent	Red Listed (BoCCI)
Little Egret	Present	Confirmed	Annex I (EU Birds Directive)
Hen Harrier	Present	Absent	Annex I (EU Birds Directive)
Lapwing	Present	Probable	Annex I (EU Birds Directive), Red Listed (BoCCI)
Golden Plover	Present	Present	Annex I (EU Birds Directive), Red Listed (BoCCI)
Woodcock	Present	Probable	Red Listed (BoCCI)
Curlew	Present	Confirmed	Red Listed (BoCCI)
Redshank	Absent	Confirmed	Red Listed (BoCCI)
Black-headed Gull	Present	Confirmed	Red Listed (BoCCI)
Herring Gull	Present	Absent	Red Listed (BoCCI)
Barn Owl	Present	Confirmed	Red Listed (BoCCI)
Merlin	Present	Absent	Annex I (EU Birds Directive), Amber Listed (BoCCI)

3.1.3 BirdWatch Ireland Bird Sensitivity to Wind Energy Developments

BirdWatch Ireland developed a mapping tool to give a spatial indication of where protected bird species are likely to be sensitive to wind energy developments⁵. The potential impact of wind energy developments on protected birds includes loss of habitat and fragmentation, disturbance displacement, collision risk and the barrier effect (obstruction movement within the landscape). Information relating to risk and expert opinion was used to assign a sensitivity score. The bird sensitivity score has been mapped on a 1 km grid square level.

The area in which the proposed development is located (N07, N06 and N16) does not have data available (unknown) for the majority of the landholding. Bird sensitivity data is available for a section of Derryadd bog in the southwest of the proposed development area. This area has been categorised as of **Low** sensitivity to impacts from the wind energy industry. This classification indicated that impacts from wind farms in this area on protected bird species are considered to be low. This is an indicative measure and may be subject to change as new information comes to light.

3.2 FIELD SURVEY

The main findings of the bird surveys are summarised for each species in this section titled Winter Bird Surveys. This section includes the results from the following surveys; Vantage Point Surveys, Winter Birds Walkover Survey, Hen Harrier Roost Survey and I-WeBS. The focus of the surveys was to quantify the level

⁵ McGuinness *et al.*, (2015) Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. Guidance Document. (Accessed: May 2018)

of flight activity at the site and to establish the distribution and abundance of those species which are at potential risk from impacts associated with the development (Target species). Sensitivity to potential effects of the development is based on the extensive desktop study conducted, consultation with relevant stakeholders and field studies. Sensitivity factors include one or more of the following – collision risk, habitat loss, disturbance displacement and/ or barrier effect within the study area.

A comprehensive list of birds recorded within the study area is provided in Table 3.3 below. Bird species assemblages vary between seasons (breeding & non-breeding/ winter); this variation is typically due to the migration rates of individual species. The breeding bird species list details conservation status and provides comments as appropriate. The level of conservation concern was drawn from the two lists; Birds of Conservation Concern in Ireland and from Annex I of the EU Birds Directive. A excel spreadsheet accompanies this report, which contains all data related to Derryadd Winter Bird Surveys 2017/ 2018 carried out by TOBIN Consulting Engineers.

Table 3.3: Details the full species list for the winter bird surveys 2017/ 2018

Species Name	Conservation Status	Comment
Blackbird (<i>Turdus merula</i>)	Green Listed	Resident
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	Red Listed	Resident
Blue Tit (<i>Cyanistes caeruleus</i>)	Green Listed	Resident
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Green Listed	Resident
Buzzard (<i>Buteo buteo</i>)	Green Listed	Resident
Chaffinch (<i>Fringilla coelebs</i>)	Green Listed	Resident
Coal Tit (<i>Periparus ater</i>)	Green Listed	Resident
Common Gull (<i>Larus canus</i>)	Amber Listed	Resident
Curlew (<i>Numenius arquata</i>)	Red Listed	Resident/ Winter visitor
Dunnock (<i>Prunella modularis</i>)	Green Listed	Resident
Fieldfare (<i>Turdus pilaris</i>)	Green Listed	Winter visitor
Goldcrest (<i>Regulus regulus</i>)	Amber Listed	Resident
Golden Plover (<i>Pluvialis apricaria</i>)	Red Listed	Resident/ migrant
Goldfinch (<i>Carduelis carduelis</i>)	Green Listed	Resident
Great Black-backed Gull (<i>Larus marinus</i>)	Amber Listed	Resident
Great Crested Grebe (<i>Podiceps cristatus</i>)	Amber Listed	Resident
Great Tit (<i>Parus major</i>)	Green Listed	Resident
Greenfinch (<i>Carduelis chloris</i>)	Amber Listed	Resident
Grey Heron (<i>Ardea cinerea</i>)	Green Listed	Resident
Hooded Crow (<i>Corvus cornix</i>)	Green Listed	Resident
Jackdaw (<i>Corvus monedula</i>)	Green Listed	Resident
Jay (<i>Garrulus glandarius</i>)	Green Listed	Resident
Kestrel (<i>Falco tinnunculus</i>)	Amber Listed	Resident
Lapwing (<i>Vanellus vanellus</i>)	Red Listed	Resident
Lesser Black-backed Gull (<i>Larus fuscus</i>)	Amber Listed	Resident
Lesser Redpoll (<i>Carduelis flammea</i>)	Green Listed	Resident
Little Egret (<i>Egretta garzetta</i>)	Green Listed, Annex I	Resident
Linnet (<i>Carduelis cannabina</i>)	Amber Listed	Resident
Long-eared Owl (<i>Asio otus</i>)	Green Listed	Resident
Long-tailed Tit (<i>Aegithalos caudatus</i>)	Green Listed	Resident
Magpie (<i>Pica pica</i>)	Green Listed	Resident
Mallard (<i>Anas platyrhynchos</i>)	Green Listed	Resident

Species Name	Conservation Status	Comment
Meadow Pipit (<i>Anthus pratensis</i>)	Red Listed	Resident
Merlin (<i>Falco columbarius</i>)	Amber Listed, Annex I	Resident, infrequent on site
Mistle Thrush (<i>Turdus viscivorus</i>)	Amber Listed	Resident
Moorhen (<i>Gallinula chloropus</i>)	Green Listed	Resident
Pheasant (<i>Phasianus colchicus</i>)	Green Listed	Resident
Pied Wagtail (<i>Motacilla alba</i>)	Green Listed	Resident
Raven (<i>Corvus corax</i>)	Green Listed	Resident
Redpoll (<i>Carduelis flammea</i>)	Green Listed	Resident
Redshank (<i>Tringa totanus</i>)	Red Listed	Resident
Reed Bunting (<i>Emberzia schoenichus</i>)	Green Listed	Resident
Robin (<i>Erithacus rubecula</i>)	Amber Listed	Resident
Rook (<i>Corvus frugilegus</i>)	Green Listed	Resident
Skylark (<i>Alauda arvensis</i>)	Amber Listed	Resident
Siskin (<i>Carduelis spinus</i>)	Green Listed	Resident
Snipe (<i>Gallinago gallinago</i>)	Amber Listed	Resident
Song Thrush (<i>Turdus philomelos</i>)	Green Listed	Resident
Sparrowhawk (<i>Accipiter nisus</i>)	Amber Listed	Resident
Stonechat (<i>Saxicola torquatus</i>)	Amber Listed	Resident
Teal (<i>Anas crecca</i>)	Amber Listed	Resident
Whooper Swan (<i>Cygnus cygnus</i>)	Amber Listed	Winter visitor
Wigeon (<i>Anas penelope</i>)	Red Listed	Winter visitor
Woodcock (<i>Scolopax rusticola</i>)	Red Listed	Resident
Woodpigeon (<i>Columba palumbus</i>)	Green Listed	Resident
Wren (<i>Troglodytes troglodytes</i>)	Green Listed	Resident

3.2.1 Key Species of Conservation Significance

Lapwing (Red Listed BoCCI)

An estimated 2,000 breeding pairs of Lapwing are present in Republic of Ireland (ROI)⁶, the wintering population reaches 210,000 annually (All Ireland (AI))⁷. It is unknown if breeding birds within Ireland are resident, migrants arrive in the autumn to coastal areas or suitable inland habitat. This species is thinly distributed across the country as a breeding species. Its breeding population have experienced a 74% decline in the past 25 years⁸.

Winter Bird Surveys

This species was recorded frequently over the course of surveys at the site. This species was observed on 38 occasions during winter vantage point surveys in 2017/ 18. Flock size ranged from 1 to 110 birds. The species was recorded in each month surveyed (October to March). A large proportion of observations concerned birds commuting or foraging along the River Shannon. During the 2010 Copland Study, Lapwings were recorded as a probable breeder at Derrycashel bog. Derrycashel bog is an area of cutaway bog

⁶ Lauder, C. and Donaghy, A. (2008) Breeding Waders in Ireland 2008, a review and recommendations for future actions. Report to the National Parks and Wildlife Service, Ireland.

⁷ Boland, H. & Crowe, O. (2012) Irish wetland bird survey: waterbird status and distribution 2001/02 – 2008/09. BirdWatch Ireland, Kilcoole, Co. Wicklow.

⁸ Colhoun and Cummins (2013) Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544.

fringing the River Shannon to the north of the site. No evidence of breeding was noted within the proposed development area in late winter/ early spring. I-WeBS surveys of the hinterland of the proposed development area recorded Lapwing principally along the River Shannon and in flooded fields adjacent to the river. Flock size ranged from 1-180 birds (2017/ 18). The Fortwilliam Turlough located c. 5km to the west of the proposed development area was also notable for its 2017/ 18 wintering population of Lapwing (maximum site count was 220 birds). Flock size was well below national importance estimates (1% of the national population is 2,100 birds). See Appendix 1 Figure 1 for details on the locations of Lapwing observations.

Golden Plover (Red Listed BoCCI, Annex I EC Birds Directive)

An estimated 150 breeding pairs of Golden Plover are present in ROI⁹, the wintering population is more abundant numbering 170,000 birds (AI)⁷. Birds within Ireland are partially migrants wintering on the coast or suitable inland habitat. This species is widely distributed around the coast and at some inland sites throughout the country. Breeding is limited to the uplands of the west and north-west of the country.

Winter Bird Surveys

This species was frequently recorded within the proposed development area. Records were made October to March 2017/ 18 at the proposed development area. During winter vantage point survey 37 observations were recorded in total. Behavioural observations included individuals/ flock roosting on bare peat within the development boundary. Flock size ranged from 1 to 800 birds. The peak count of 800 birds was recorded offsite along the River Shannon. I-WeBS surveys of the hinterland of the proposed development area recorded Golden Plover principally along the River Shannon and in flooded fields adjacent to the river. Flock size ranged from 20-600 birds (2017/ 18). The Fortwilliam Turlough located c. 5 km to the west of the proposed development area was also notable for its 2017/ 18 wintering population of Golden Plover (maximum site count was 520 birds). Although large, these flocks were well below national importance estimates (1% of the national population is 1,700 birds). See Appendix 1 for details on the locations of Golden Plover observations.

Curlew (Red Listed BoCCI)

An estimated 100-200 breeding pairs of Curlew are present in ROI (EO)¹⁰, the non-breeding population swells to 55,000 birds (AI)⁷ in winter. Wintering birds present in Ireland are resident or migrants from Scandinavia and Britain. This species is now thought to be a very rare breeder of upland and bog habitats in Ireland. The breeding distribution is poorly known, although breeding pairs are thought to still be present on the Shannon Callows. Its breeding population have experienced a 70% decline in the past 25 years⁸.

Winter Bird Surveys

Curlew were recorded on two occasions during winter vantage point surveys: 11th of October and 12th of December 2017. Both observations concerned commuting individuals. Flock size ranged from 1 to 3 birds. No further records of this species were made during winter vantage point surveys. During I-WeBS survey on the 24th of November 2018 a notable flock of 26 Curlew was recorded at Fortwilliam Turlough (c. 5km to the west of the site). Flock size was well below national importance estimates (1% of the national population is 550 birds).

⁹ Lauder, C. and Donaghy, A. (2008) *Breeding Waders in Ireland 2008, a review and recommendations for future actions*. Report to the National Parks and Wildlife Service, Ireland.

¹⁰ Expert opinion: BirdWatch Ireland

Snipe (Amber Listed BoCCI)

An estimated 5,000 breeding pairs of Snipe are present in ROI6, winter numbers are unknown owing to the difficulties in surveying this secretive species. Birds present in Ireland are resident or migrants from Scandinavia and Britain. This species is thought to be widely distributed throughout the country, but it is difficult to survey due to its secretive nature.

Winter Bird Surveys

The species was recorded frequently over the course of surveys at the site. This species was observed on 38 occasions during winter vantage point surveys in 2017/ 18. Flock size ranged from 1 to 18 birds. The species was recorded in each month surveyed (October to March). Snipe were recorded infrequently and in low numbers during I-WeBS surveys. See Appendix 1 for detailed information on the recorded locations of Snipe.

Snipe are a difficult species to survey owing to their secretive nature and nocturnal habit. As a result, this species is typically under recorded; often the most common observation of this species involved birds flying from cover in response to local disturbance.

Woodcock (Red Listed BoCCI)

Population estimates for both breeding and wintering Woodcock are unknown in Ireland. The mainly sedentary Irish population is joined by wintering birds from Fennoscandia, Russia and Britain. This species breeds in woodland of all types. Woodcock has undergone long term declines in its breeding range of greater than 70%.

Winter Bird Surveys

This species was only recorded in the final month of winter surveys at the site. On the 21st of March 2018 Woodcock were recorded on six occasions in an area of scrub to the northwest Derryarogue bog. This species was also recorded on the 22nd of March 2018 off site at Mountdillon bog (c. 2 km north of the proposed development area). See Appendix 1 for detailed information on the recorded locations of Woodcock.

Whooper Swan (Annex I EU Birds Directive)

The wintering population of Whooper Swan has been increasing since 1995, an estimated 15,104 (AI) birds winter in Ireland. This population is currently thought stable¹¹. The birds which winter in Ireland and breed in Iceland, constitute 60% of this population. Birds arrive in September or October and remain until March or April. The birds utilise the following habitats; lakes, marshes, lagoons, sheltered inlets and feed on occasion on agricultural fields.

Winter Bird Surveys

Whooper Swans were recorded regularly during vantage point surveys. Observations were made throughout the wintering period, of October to March (2017/ 18). There was a combined total of 122 separate flights recorded from winter vantage points. A large cohort of these observed flights involved individuals flying offsite along the River Shannon. These flights were primarily associated with flock commuting. Flock size ranged from 1 to 70 birds. Over the course of surveying, Whooper Swans were observed to utilise flooded

¹¹ Crowe, O. et al., (2015) Whooper Swan *Cygnus Cygnus* and Bewick's C. *Columbianus bewickii* Swans in Ireland: results of International Swan Census, January 2015. Irish Birds Volume 10 Number 2.

bog opportunistically for roosting and feeding. Notable parcels of land with feeding/ roosting flocks included, Derrycashel (offsite) and Derryarogue (onsite). On the 15th of February 2018 a flock of c. 100 birds was flushed by a tractor from an area of flooded bog in Derryarogue (onsite). The Fortwilliam Turlough located c. 5 km to the west of the proposed development area was also notable for its 2017/ 18 wintering population of Whooper Swan (maximum site count was 88 birds).

Mute Swan (Amber Listed BoCCI)

An estimated 11,440 Mute Swans winter in Ireland, the breeding population is unknown⁷. The Irish population is non-migratory and is recognised as one of seven global populations. They can be seen throughout Ireland on suitably large water bodies generally at altitudes below 300 metres.

Winter Bird Surveys

This species was irregularly seen onsite. The vast majority of observations were of birds on the River Shannon to the north and west of the site. Numbers recorded during I-WeBS surveys did not exceed 25 individuals.

Little Egret (Annex I EC Birds Directive)

The population trends for this species in Ireland are unknown, but the species is becoming increasingly widespread throughout the country in suitable coastal and wetland sites.

Winter Bird Surveys

Observations of this species were infrequent and clustered in habitats fringing the north of the site. There were five flights recorded during the 2017/ 18 winter survey season. During I-WeBS surveys this species was encountered frequently in low numbers in the wider surroundings of the proposed development area: Fortwilliam Turlough, Lough Ree and the River Shannon (2017/ 18).

Grey Heron (Green Listed BoCCI)

There are estimated to be 3,000 birds recorded in Ireland each winter during national I-WeBS surveys, the number of breeding individuals is unknown. Grey Heron have shown a gradual increasing trend throughout I-WeBS surveys⁷. The species is widely distributed in Ireland at wetland site which provide sufficient feeding and breeding opportunities.

Winter Bird Surveys

This species was occasionally recorded at the site. There were a total of 32 observations made during winter vantage point surveys. Flock size ranged from 1 to 2 birds. The species was regularly encountered during surveys of the wider surroundings of the proposed development area: Fortwilliam Turlough, Lough Ree and the Shannon River. The number of individuals per observation was low, numbers ranged from one to three birds.

Cormorant (Amber Listed BoCCI)

An estimated 5,211 breeding pairs of Cormorants are present in AI¹⁴, the wintering population numbers 14,000 birds⁷. The Irish population occurs in both marine coasts and freshwater. It can be found in rivers and lakes of sufficient size to provide nesting (generally in trees) and foraging habitat. Adults are typically non-migrants in Ireland. Breeding Cormorants are named among the species which contribute to the

integrity of Lough Ree SPA. In 2010 86 nests were recorded on the islands of the lough¹² this represents 1.7% of the All Ireland population.

Winter Bird Surveys

This species was frequently encountered during surveys at the site. In total there were 81 separate observations recorded during winter season surveys (2017/ 18). The vast majority of observations were of birds on the River Shannon to the north and west of the site. During March 2018 I-WeBS surveys, the maximum site count was 186 birds at Lough Ree. This constitutes a nationally important flock of Cormorant on Lough Ree (1% of the national population is 140 (wintering) and 104 (breeding) birds). See Appendix 1 for details on the locations of Cormorant observations.

Lesser Black-backed Gull (Amber Listed BoCCI)

An estimated 4,849 breeding pairs of Lesser Black-backed Gull are present in AI¹³, the wintering population is unknown due to an inconsistent survey effort for this species group⁷. The Irish population mainly breeds in wetlands, coastal cliffs and on islands at inland sites. Small numbers of this species are thought to migrate south in winter, but most appear to remain in Ireland. This species has bred previously on a number of the Lough Ree islands¹².

Winter Bird Surveys

Lesser Black-backed Gull was recorded frequently over the course of surveys at the site. This species was observed on 76 occasions during winter vantage point surveys in 2017/ 18. Flock size ranged from 1 to 49 birds. The species was recorded most frequently in late winter/ early spring (January to March 2018). A large proportion of observations concerned birds commuting across the site. Onsite areas are considered to contain sub-optimal foraging habitat for this species. I-WeBS surveys of the hinterland of the proposed development area recorded Lesser Black-backed Gull on islands within Lough Ree. In late March the numbers at Lough Ree peaked with 147 birds recorded roosting on islands on the lake (2017/ 18). See Appendix 1 for details on the locations of Lesser Black-backed Gull observations.

Black-headed Gull (Red Listed BoCCI)

An estimated 6,103 breeding pairs of Black-headed Gull are present in AI (All Ireland)¹⁴, counts of (wintering) Gulls are optional during nationally organised I-WeBS surveys, which results in inconsistent counts for this species group⁷. This species mainly breeds in wetlands, but it is adaptable in its habitat requirements in Ireland. Small numbers of the Irish population are thought to migrate to Southern Europe in winter, but most appear to remain in Ireland. Lough Ree is a traditional breeding site for this species¹².

Winter Bird Surveys

Black-headed Gull was recorded frequently over the course of surveys at the site. This species was observed on 65 occasions during winter vantage point surveys in 2017/ 18. Flock size ranged from 1 to 70 birds. The species was recorded in each month surveyed (October to March 2018). A large proportion of observations concerned birds commuting across the site or along the River Shannon. Onsite areas are considered to contain sub-optimal foraging habitat for this species. I-WeBS surveys of the hinterland of the proposed development area frequently recorded Black-headed Gull (2017/ 18). As with Lesser Black-backed Gulls, their numbers increased as spring approached. Peak counts were recorded during March

¹² Lough Ree SPA site synopsis: <https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004064.pdf>

¹³ Mitchell, P.I., Newton, S.F., Ratcliffe, N. and Dunn, T.E. (2004) *Seabird Populations of Britain and Ireland*. Poyser, London, UK

¹⁴ Mitchell, P.I., Newton, S.F., Ratcliffe, N. and Dunn, T.E. (2004) *Seabird Populations of Britain and Ireland*. Poyser, London, UK.

2018. The total recorded in late March 2018 was 166 birds (across all I-WeBS sites). See Appendix 1 for details on the locations of Black-headed Gull observations.

Other Key Water Bird Species

Lough Ree and the River Shannon are located adjacent to the northern section of the proposed development area. Coot (Amber Listed BoCCI), Moorhen (Green Listed BoCCI), Mallard (Green Listed BoCCI), Teal (Amber Listed BoCCI), Goldeneye (Red Listed BoCCI), Wigeon (Red Listed BoCCI), Great Crested Grebe (Amber Listed BoCCI), Common Gull (Amber Listed BoCCI) and Great Black-backed Gull (Amber Listed BoCCI) were all frequently recorded foraging in this river or Lough Ree during 2017/ 18 winter season surveys. Pintail (Red Listed BoCCI) were also occasionally recorded. On the 22nd of March 2018 three separate flocks of Redshank (Red Listed BoCCI) were recorded along the River Shannon adjacent to Derryarogue bog (offsite).

Hen Harrier (Annex I EC Birds Directive)

This species is included on the Amber List of Bird of Conservation Concern in Ireland due the historical decline in its breeding population¹⁵. In 2015, an estimated 108-157 breeding pairs of Hen Harrier were recorded during the national Hen Harrier survey (Republic of Ireland (ROI))¹⁶. This represents a decline since the 2010 national survey. Birds within Ireland are resident. Many individuals move from upland breeding habitat to lowland foraging habitat in late summer/ early autumn. This species is mainly found in the midlands, west and south-west. Hen Harrier are particularly nomadic during the autumn.

Winter Bird Surveys

Hen Harrier were recorded within the study area on 10 occasions during winter vantage point surveys. The species was recorded in each month surveyed (October to March 2018). The activities recorded included hunting and commuting through the proposed development area. Most activity was confined to the more open areas within the site boundary between the birch thickets. Both male and female birds were recorded. Additionally, Hen Harrier were recorded on two occasions offsite at Derryglash bog to the south-west of the proposed development. Although Hen Harrier were noted to utilise the site for foraging, no roost was located during the Hen Harrier Roost Surveys, undertaken October to March (2017/ 18) inclusive. See Appendix 1 for detailed information on the recorded locations of Hen Harrier.

Kestrel (Amber Listed BoCCI)

The estimated breeding and wintering populations of Kestrel is unknown in Ireland. This is a widely distributed species in Ireland, foraging and breeding in the majority of open habitats. Kestrels are largely sedentary in Ireland, only migrating to lower latitudes during the winter months.

Winter Bird Surveys

Kestrels were frequently recorded during the 2017/ 18 winter season surveys. The species was recorded in each month surveyed (October to March 2018). The species was recorded on 103 occasions during vantage point surveys and on a three occasion during walked transects. The wider surroundings also contain a resident population of Kestrels. Kestrels were observed hunting primarily in undisturbed ground, such as scrub and rough grassland. See Appendix 1 for detailed information on the recorded locations of Kestrel.

¹⁵ Colhoun and Cummins (2013) Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544.

¹⁶ Ruddock, M. *et al.*, (2016) The 2015 national survey of breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. NPWS.

Buzzard (Green Listed BoCCI)

Buzzard breeding numbers and range has been steadily increasing after a historical decline in Ireland¹⁷. Adults are largely resident within Ireland. While immature individuals are actively nomadic from their first September until they reach maturity at 2 years. This species is found predominantly in the east and north of the country. Buzzards frequent all habitats which provide open areas for hunting with trees or crags for nesting.

Winter Bird Surveys

Buzzards were frequently recorded during the 2017/ 18 winter season surveys. The species was recorded on 91 occasions during vantage point surveys and on a six occasion during walked transects. The number of individuals ranged from 1 to 3 birds per flight. The wider surroundings also contain a resident population of Buzzards. The majority of the winter season observations were of hunting and/ or soaring individuals. Buzzards were observed hunting primarily in undisturbed ground, between birch thickets. See Appendix 1 for detailed information on the recorded locations of Buzzard.

Sparrowhawk (Amber Listed BoCCI)

The Sparrowhawk is one of the most common and widespread raptor species in Ireland. In areas where it is absent it is typically due to a lack of suitable woodland or scrub for breeding¹⁸. Adults are sedentary in Ireland. This species breeding population has experienced a 33% decline over the past 25 years¹⁵.

Winter Bird Surveys

This species was observed regularly over the course of 2017/ 18 winter season surveys. The species was recorded on 48 occasions during winter vantage point surveys. Sparrowhawks were recorded on a further two occasions during walked transect and/or during Hen Harrier Roost Surveys. Both sexes were recorded. Sparrowhawk were observed hunting primarily in scrub and on cutaway bog. Sparrowhawk were recorded at a number of locations on return visits. It is therefore considered likely that the proposed development area hosts a resident population of Sparrowhawk. See Appendix 1 for detailed information on the recorded locations of Sparrowhawk.

Other raptors

On the 14th of February 2018 a Merlin (Annex I EC Birds Directive) was recorded commuting through the south of Derryadd bog (See Appendix 1). It is considered that this was likely a nomadic individual moving through the area on route to suitable wintering habitat. On the 13th of October 2017 a Long-eared Owl (Green Listed BoCCI) was recorded from a conifer plantation along the margins of Derryarogue bog. On the 16th of February 2018 a potential White-tailed Eagle (Annex I EC Birds Directive, Red Listed BoCCI) was recorded commuting along the River Shannon adjacent to the north of the site.

Passerines of High Conservation Concern

Meadow Pipit (Red Listed BoCCI) have experienced a short-term decline in their breeding population (>50%)⁸. This species was commonly encountered in peatland habitats and wet grassland.

¹⁷ Greenwood, J.J.D., *et al* (2003) Numbers and international importance of raptors and owls of Britain and Ireland. In *Birds of Prey in a Changing Environment*. pp 25-49.

¹⁸ Gibbons *et al.*, (1993) *The new atlas of breeding birds in Britain and Ireland:1988-1991*. T. & A.D. Poyser, London.

Other Fauna

On the 15th of February 2018 a Coypu (*Myocaster coypus*) track was found within the study area c. 1km to the north-west of the proposed development area at Moundillon bog. This species has been assessed as having a potential to be a high impact invasive species in Ireland. It is listed on the Third Schedule Part 2 of the European Communities (Birds and Natural Habitats) Regulations 2011 in Ireland. Given the nature of the proposed development it is not considered likely that its inclusion in the landscape would facilitate the further spread of this species locally.

This Coypu record was subsequently reported to the National Parks and Wildlife Service.

Irish hare were frequently encountered throughout the site. Badger field signs were also encountered irregularly within the proposed development area.

4 EVALUATION

4.1 DESK STUDY EVALUATION

A number of bird species of conservation concern were recorded within the proposed development area during the most recent Bird Atlas 2007-11. Grid squares N07, N06 and N16 comprise the area in which the study area is located. The study area is classified as of unknown/ low bird sensitivity to wind energy developments.

Little Egret, Curlew, Redshank, Black-headed Gull and Barn Owl were confirmed to have bred during the most recent Bird Atlas (2007-11) within the grid square N07, N06 and N16 (onsite) and N05 and N17 (wider surroundings). However, the cutaway habitats of the proposed development area are considered to be sub-optimal for these species. During the Bird Atlas (2007-11) wintering Hen Harrier were recorded as present within the relevant grid squares. The peatland habitats of the proposed development area are considered suitable for this species. Lapwing, Woodcock, Tufted Duck and Shoveler were recorded as 'probable breeders' within the relevant grid squares during the most recent Bird Atlas (2007-11). In March 2018 field surveys noted displaying Woodcock within the proposed development area.

Within the grid squares N07, N06 and N16 (onsite) and N05 and N17 (wider surroundings) a number of additional species were recorded to be present during the most recent Bird Atlas (2007-11). Whooper Swan, Wigeon, Pochard, Goldeneye, Herring Gull and Merlin were recorded as present during the winter and absent during the breeding season. The cutaway habitats of the proposed development area are unlikely to provide suitable habitat for Whooper Swan, Wigeon, Pochard, Goldeneye or Herring Gull. However temporary flooding events has previously attracted water birds (Whooper and Mute Swans) onsite. Merlin could potentially utilise the habitats of the proposed development area, however field surveys only recorded this species within the proposed development area on a single occasion October to March (2017/ 18).

As previously stated, there are no sites designated under the EU Habitats Directive and EU Birds Directive, i.e. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), located within the footprint of the proposed development area. The nearest SPAs are Lough Ree SPA to the west and Ballykenny-Fisherstown Bog SPA to the north. NPWS site synopsis details the presence of wintering water birds within the nearby Lough Ree SPA and Ballykenny-Fisherstown Bog SPA, as detailed in Table 3.1. It is considered that migratory/ wintering water bird surveys were of particular importance, given the proximity of the nearby SPAs and that developments outside the boundary of a designated site but nearby may still impact the qualifying interest within.

Although there are no European sites designated for Hen Harrier within the wider surroundings of the proposed development area, a Hen Harrier Roost was previously located with the 10km grid square N07¹⁹. The northern portion of the proposed development area is within the 10km grid square N07. This species is showing a decreasing population trend nationally. The habitat most favoured by this species within Ireland is heather moorland, conifer plantations (particularly second rotation forest)²⁰. The habitats within the proposed development area and the wider surroundings are considered suitable for wintering Hen Harrier.

In summary, local designated sites contain noteworthy bird populations which are present in nationally important numbers in some instances, therefore winter bird surveys were required to establish a population baseline to facilitate robust quantitative assessments of any potential impacts from the proposed

¹⁹ NPWS, (2015) Hen Harrier Conservation and the Forestry Sector in Ireland. Report prepared by NPWS to inform the Hen Harrier Threat Response Plan (HHTRP) Version 3.2. 1-50.

²⁰ Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

development. Similarly, the wider surroundings of the proposed development area may contain supporting habitat for several species of conservation concern. Surveys were conducted to investigate this possibility.

4.2 FIELD STUDY EVALUATION

Golden Plover (Annex I EC Birds Directive) were recorded foraging and roosting within the proposed development area. These observations were throughout the survey season, October to March (2017/ 18). Given that this species was most often recorded on bare peat within the proposed development boundary, the species is considered to utilise the site for roosting and foraging. Numbers were well below national importance estimates (1% of the national population is 1,700 birds).

Three Red Listed Birds of Conservation Concern in Ireland (BoCCI) were recorded within the proposed development area: Lapwing, Curlew and Woodcock. A Curlew was recorded twice commuting across the site. There were no further Curlew records. Woodcock was recorded as possible breeder's onsite/ within the wider surroundings of the proposed development area during the Bird Atlas (2007-11). The observation of a roding (displaying) male Woodcock within the fringing habitat of the northern boundary of the site confirms the presence of territorial males locally. Lapwing were recorded at the proposed development area. Given the presence of bare peat over a large proportion of the site, the species is considered to likely use the site for roosting and foraging. Flock size was well below national importance estimates (1% of the national population is 2,100 birds).

Whooper Swan (Annex I EC Birds Directive) were regularly encountered during winter bird surveys. The majority of records concerned birds foraging within or commuting along the River Shannon. However, during periods of heavy rain sections of the bog can be subject to flooding; during a period of heavy rain this species was attracted to the proposed development area to take advantage of this temporary feeding opportunity. Notable parcels of land with feeding/ roosting flocks included, Derrycashel (offsite) and Derryarogue (onsite). The largest flock recorded foraging/ roosting within the proposed development area contained c. 100 individuals. This constitutes a significant flock; however, numbers were below national importance estimates (1% of the national population is 150 birds).

The two gull species: Black-headed Gull and Lesser Black-backed Gull (Red Listed BoCCI) and (Amber Listed BoCCI) were frequently encountered throughout the winter survey season October to March (2017/ 18). Black-headed Gull was most commonly encountered from vantage point which bordered the River Shannon and during hinterland surveys of Lough Ree. The habitats onsite were typically not utilised for foraging for this species. Commuting flights made up the majority of the Lesser Black-backed Gull observations. Many of these flights involved individuals/ flocks crossing the site, however the majority of recorded flights concerned birds commuting along the River Shannon to the north of the site. Lesser Black-backed Gull were not found to utilise the habitats of the proposed development area for foraging, rather observations typically involved individuals/ flocks flying over the site on route to either the River Shannon or Lough Ree. Given the predominantly peatland habitats of the proposed development area, these two gull species are not considered to be dependent on the site for foraging.

The majority of other recorded water birds were noted within or adjacent to the River Shannon; these species included Little Egret (Annex I EC Birds Directive), Grey Heron (Green Listed BoCCI) and Cormorant (Amber Listed BoCCI).

Three raptor species listed on Annex I of the EC Birds Directive were recorded within the proposed development area and the wider surroundings: Hen Harrier, Merlin and White-tailed Eagle. Merlin and White-tailed Eagle were each recorded on a single occasion, during 2018 winter season surveys. Given the low level of flight activity associated with these records, it is considered that the potential for ecologically significant effects from the proposed development are limited. Hen Harrier was occasionally observed

hunting within the proposed development area. These observations were throughout the survey season, October to March (2017/ 18). Given Vantage Point Surveys and the species specific Hen Harrier Roost Surveys did not locate a roost site, it is considered that the proposed development is principally used for winter foraging.

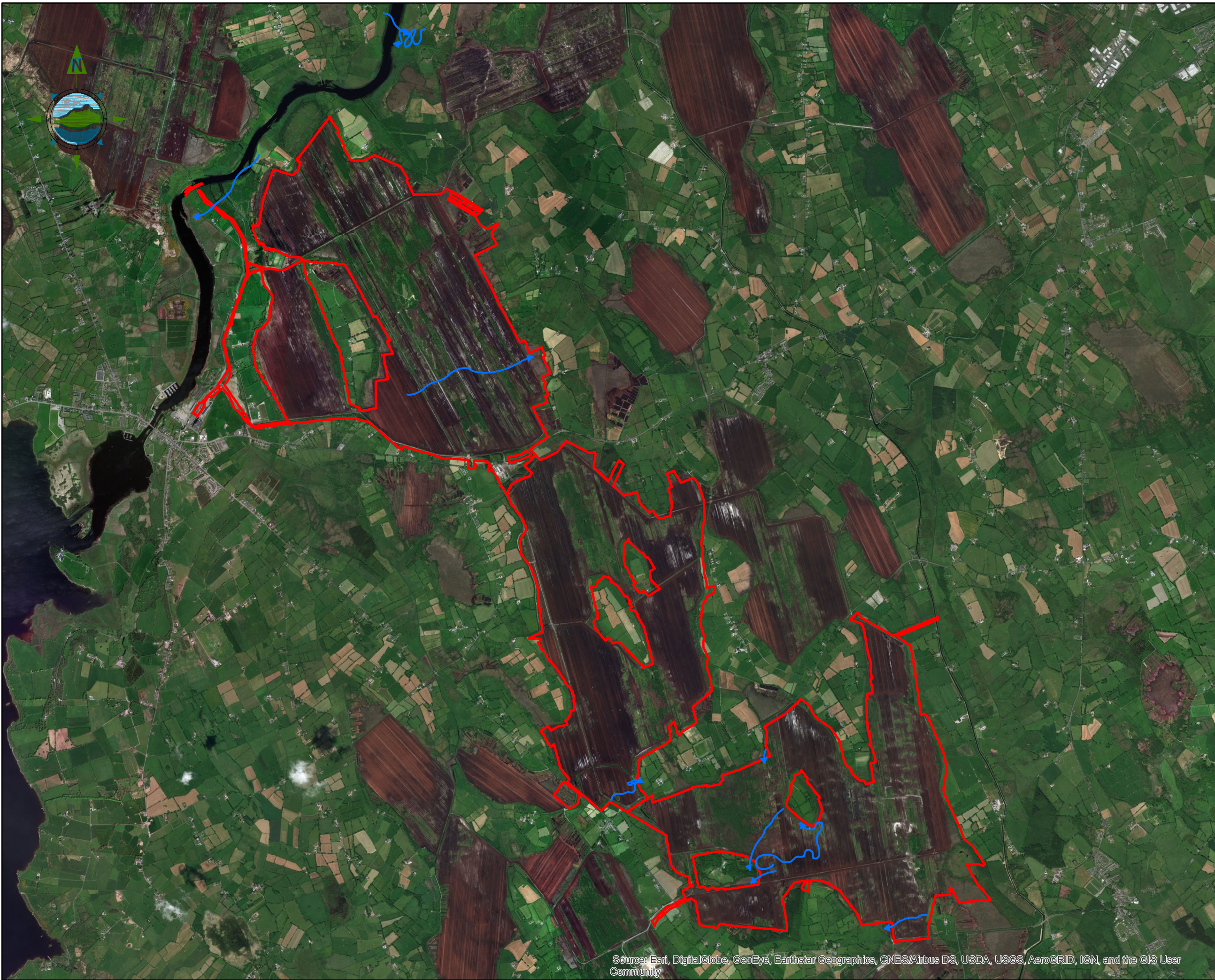
Three Amber Listed species (BoCCI) were recorded; Snipe, Kestrel and Sparrowhawk. All three are likely to be resident year-round within the proposed development area. Given the nature of the peatland habitats of the site, this species is likely to find foraging habitat within the proposed development area. Kestrel and Sparrowhawk were recorded hunting onsite. Additionally, Kestrel and Sparrowhawk were noted to utilise habitats within the wider surroundings of the proposed development area. Therefore, these species are not thought to be restricted to the habitats found within the proposed development area for foraging.

The Green Listed Buzzard (BoCCI) was the most regularly encountered raptor within the proposed development area. Given the nature of habitats within the proposed development area, Buzzard are likely to use habitats found onsite in addition to those of the wider landscape. The favourable population trend for this species nationally, limits the potential for ecologically significant impacts from the proposed development.



In summary, the principle constraint for this proposed wind farm site is the potential for impacts on wintering water birds. Potential impacts from the proposed development could include; habitat loss and fragmentation, disturbance displacement, collision risk and barrier effect. Depending on the degree of site usage, number of flight lines over the study area, the availability of alternative habitat and the results of the collision risk model (XXX collisions/year/25 years), the significance of the overall impact will only be known at impact assessment stage.

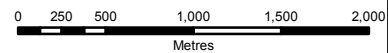
APPENDIX NO. 1

Derryadd Flight Line Maps



Legend

-  Hen Harrier Flightlines
-  Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Hen Harrier Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Hen Harrier Flightlines

Scale @ A3: 1:43,124

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

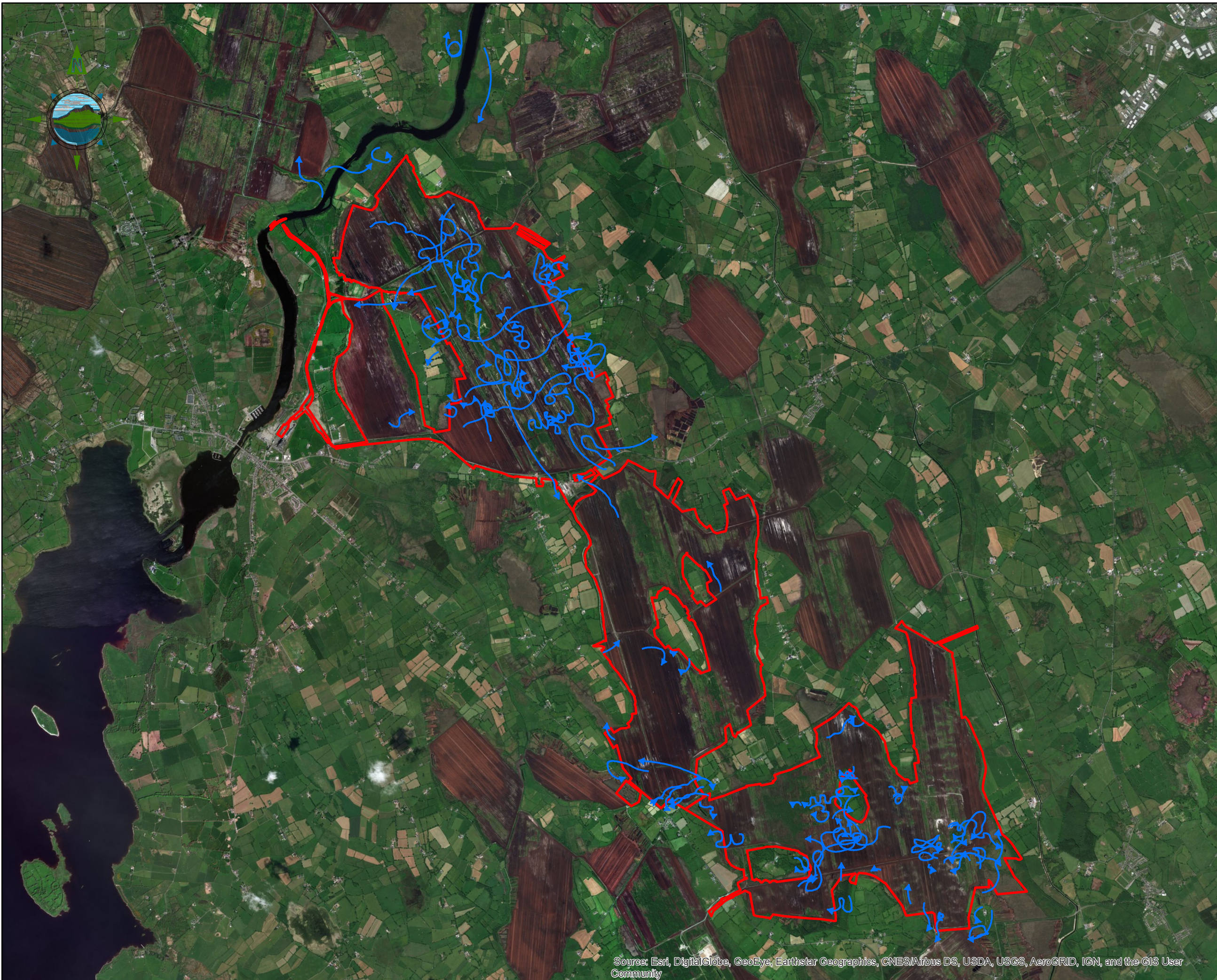


Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

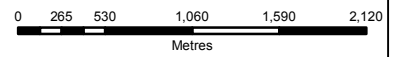
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Kestrel Flightlines
- Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Kestrel Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Kestrel Flightlines

Scale @ A3: 1:46,011

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

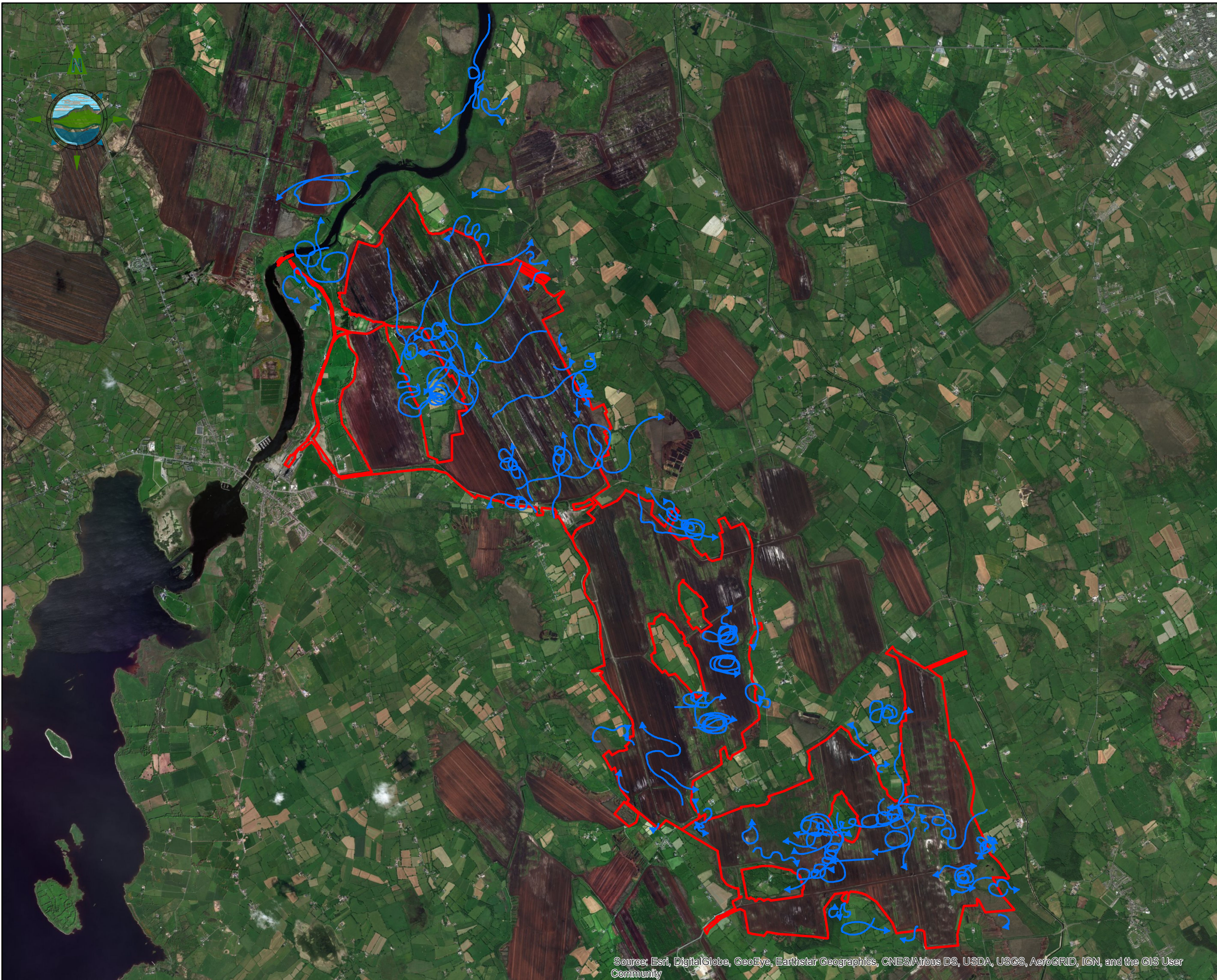
Project Director: Damien Grehan





Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

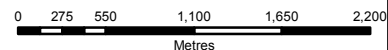
No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Drawing No.: Issue: **A**



Legend

-  Buzzard Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Buzzard Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Buzzard Flightlines

Scale @ A3: 1:47,262

Prepared by: Kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

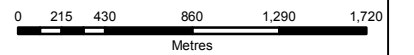
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- White Tailed Sea Eagle Flightlines
- Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	White Tailed Sea Eagle Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title:
White Tailed Sea Eagle Flightlines

Scale @ A3: 1:37,325

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

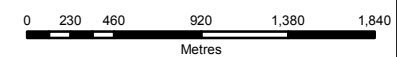
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Sparrowhawk Flightlines
- Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Sparrowhawk Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Sparrowhawk Flightlines

Scale @ A3: 1:39,988

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

TOBIN
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

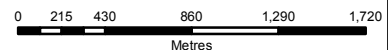
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Merlin Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Merlin Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Merlin Flightlines

Scale @ A3: 1:37,408

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

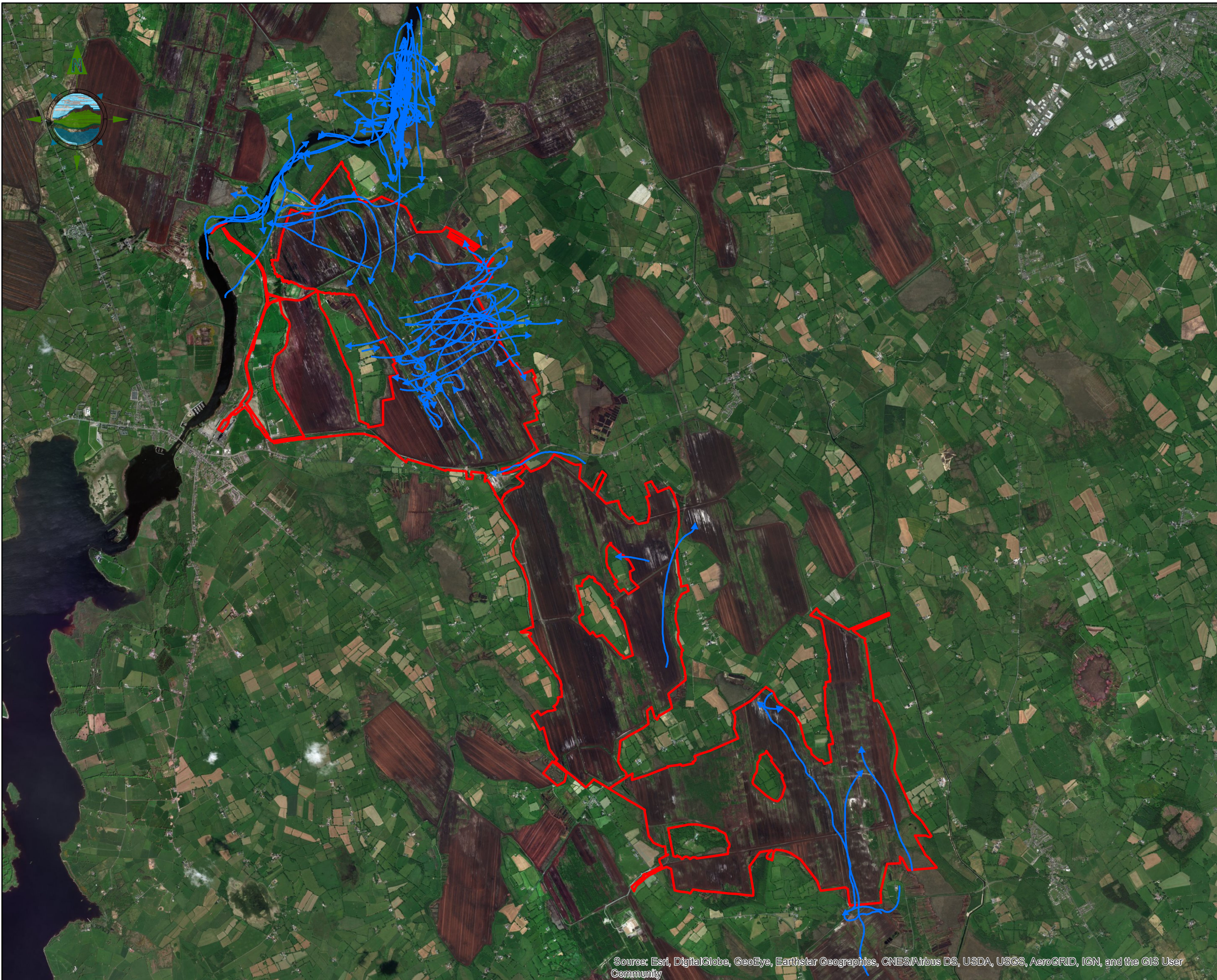


Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

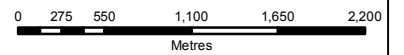
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Whooper Swan Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Whooper Swan Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Whooper Swan Flightlines

Scale @ A3: 1:47,949

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

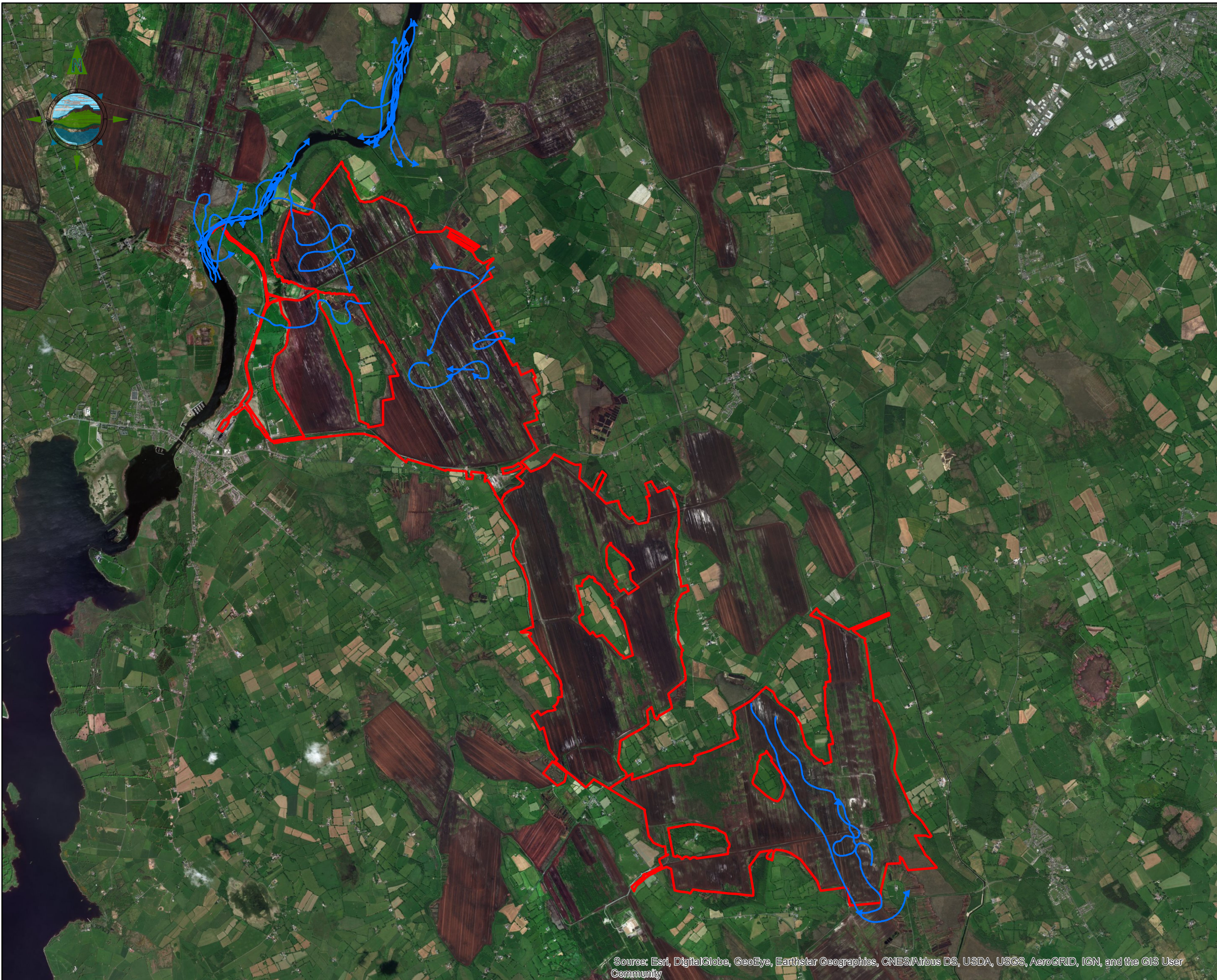


Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

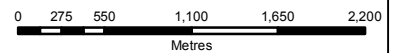
Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Mute Swan Flightlines
-  Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Mute Swan Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Mute Swan Flightlines

Scale @ A3: 1:47,949

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

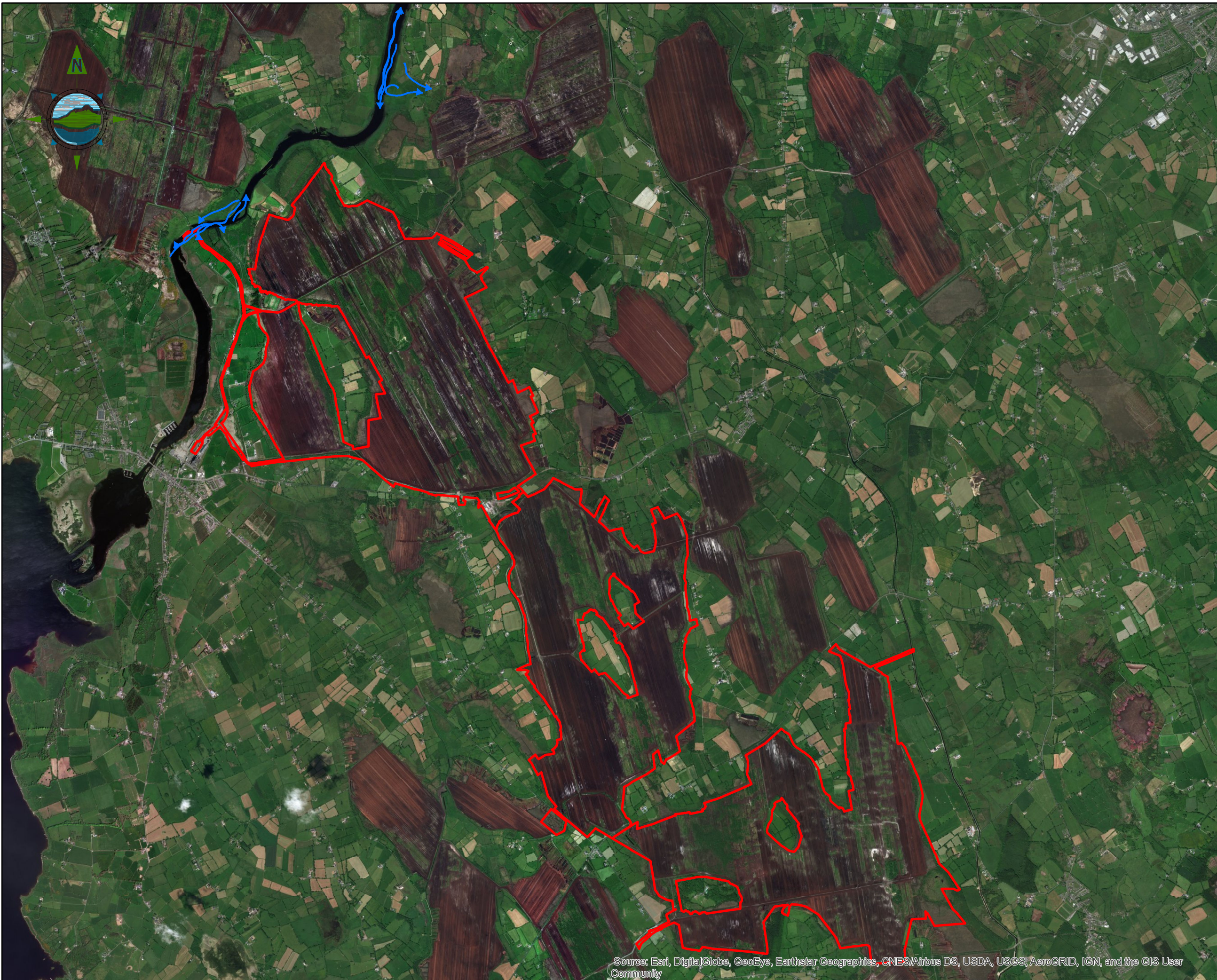


Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

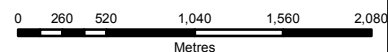
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Teal Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Teal Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Teal Flightlines

Scale @ A3: 1:44,511

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



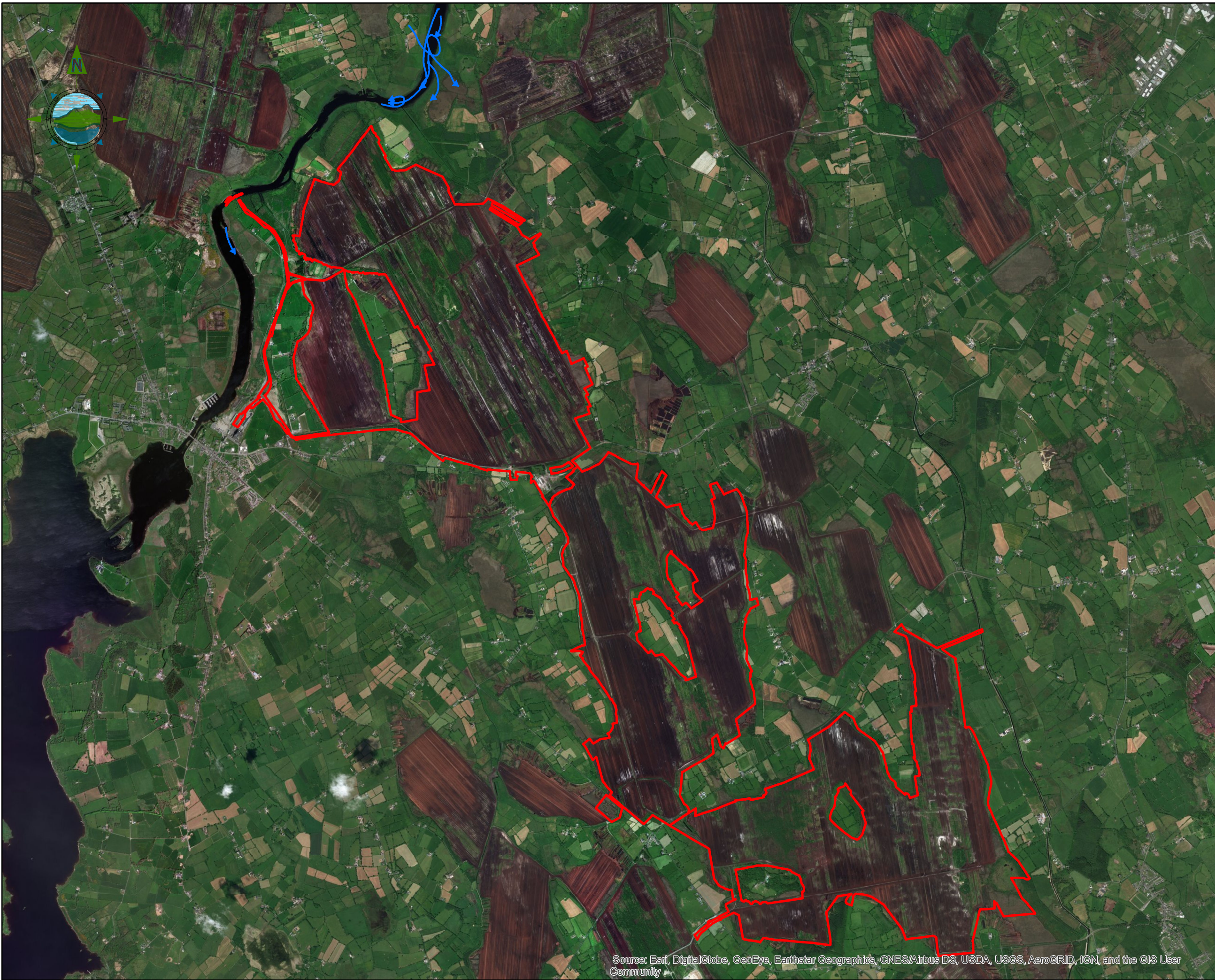
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Drawing No.:

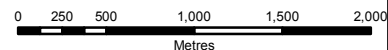
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Wigeon Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Wigeon Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Wigeon Flightlines

Scale @ A3: 1:42,883

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



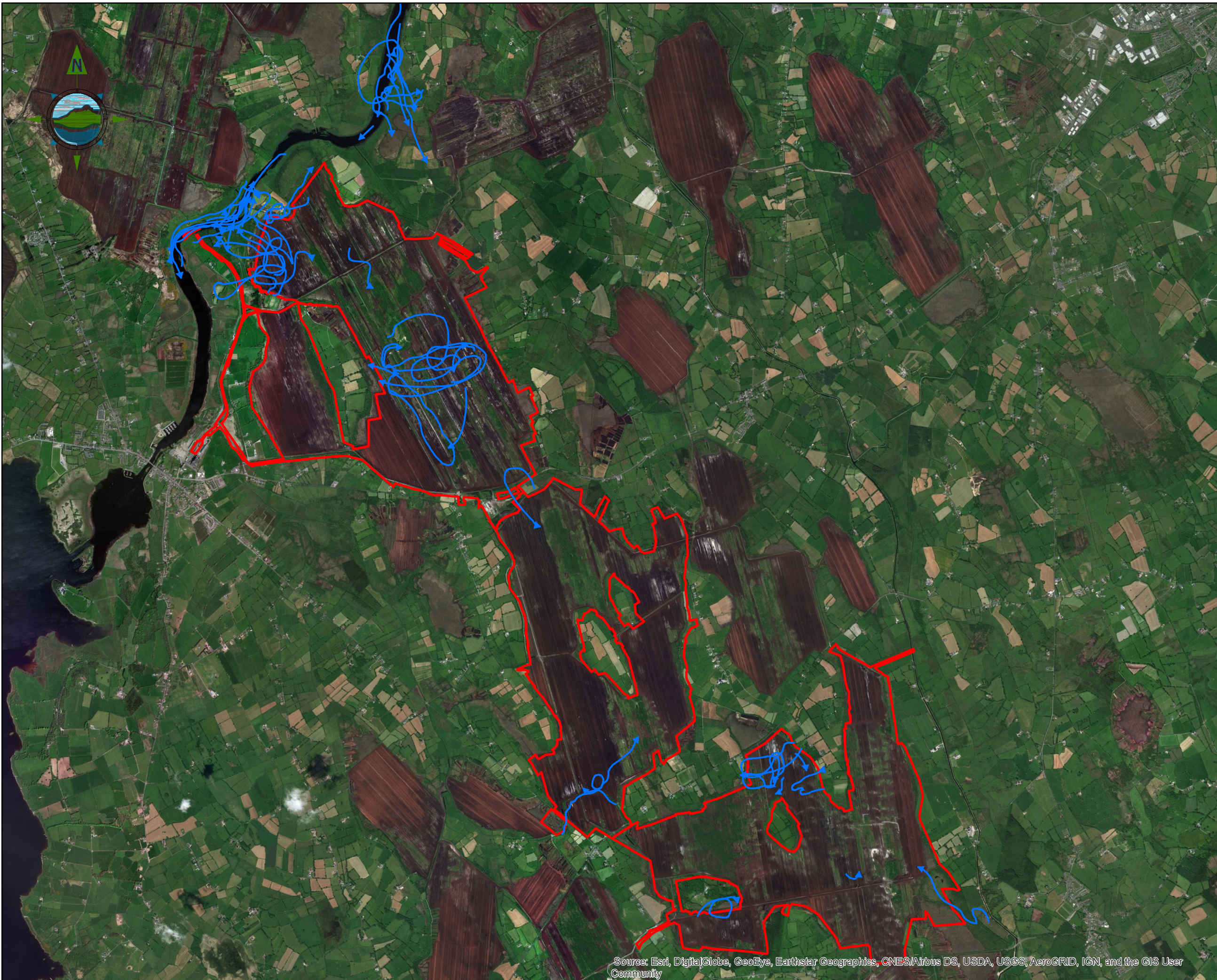
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Drawing No.:

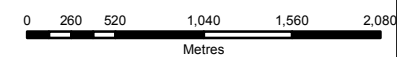
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Mallard Flightlines
- Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Mallard Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Mallard Flightlines

Scale @ A3: 1:44,511

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

TOBIN
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

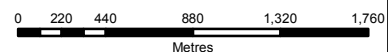
Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Woodcock Flightlines
- Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Woodcock Flight Lines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Woodcock Flightlines

Scale @ A3: 1:38,011

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Drawing No.:

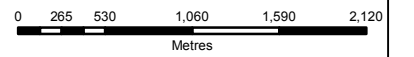
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Snipe Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Snipe Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Snipe Flightlines

Scale @ A3: 1:46,011

Prepared by: Kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

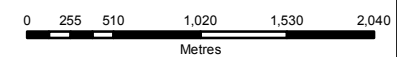
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Lapwing Flightlines
-  Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Lapwing Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Lapwing Flightlines

Scale @ A3: 1:44,451

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



TOBIN
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

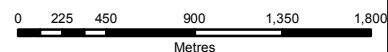
Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Curlew Flightlines
- Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Curlew Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Curlew Flightlines

Scale @ A3: 1:38,553

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



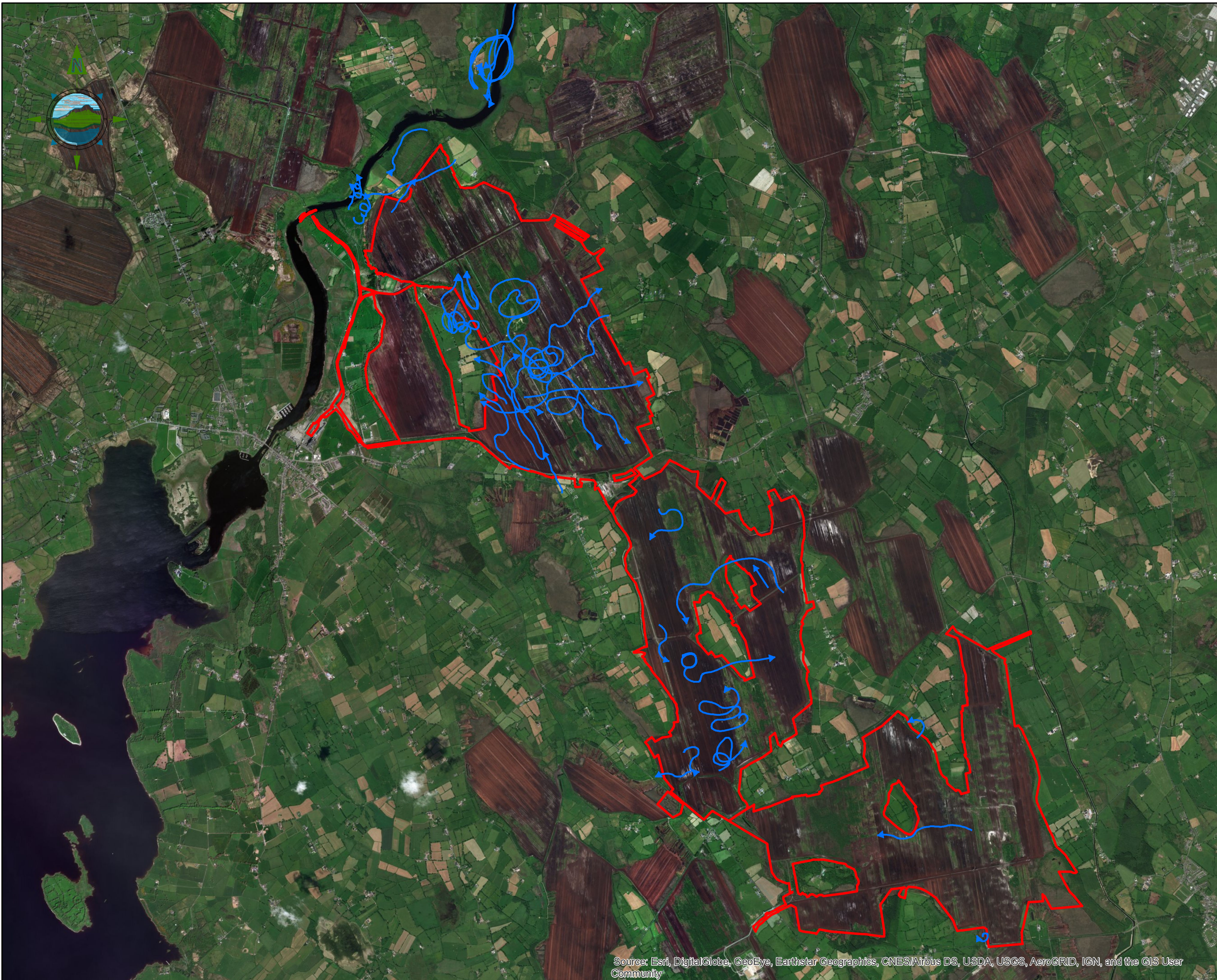
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Drawing No.:

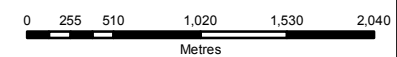
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Golden Plover Flightlines
- Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Golden Plover Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Golden Plover Flightlines

Scale @ A3: 1:44,451

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

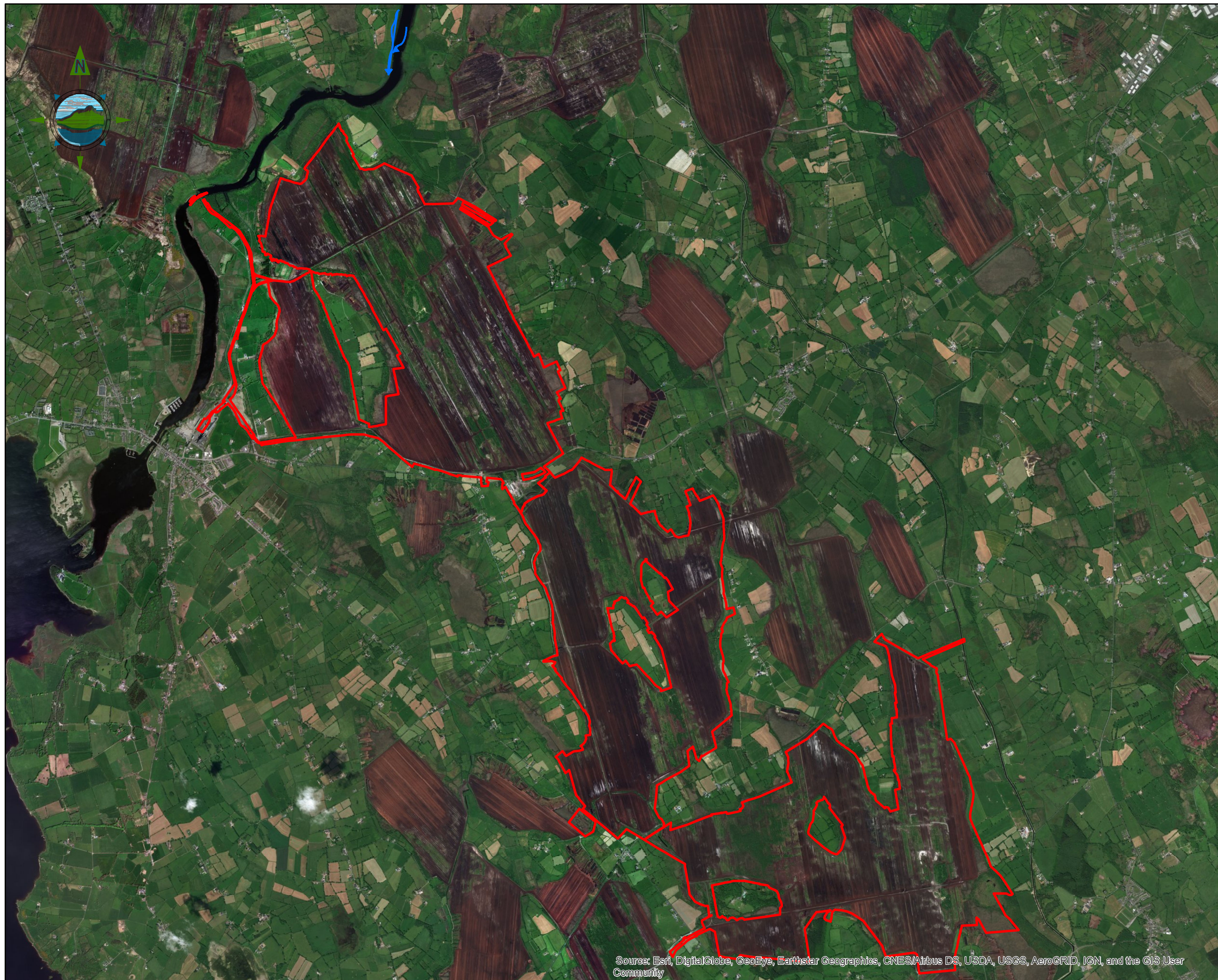
Project Director: Damien Grehan

TOBIN
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

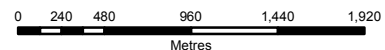
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Redshank Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Redshank Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Redshank Flightlines

Scale @ A3: 1:41,927

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Drawing No.:

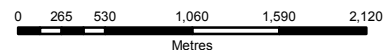
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Cormorant Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Cormorant Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Cormorant Flightlines

Scale @ A3: 1:46,011

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



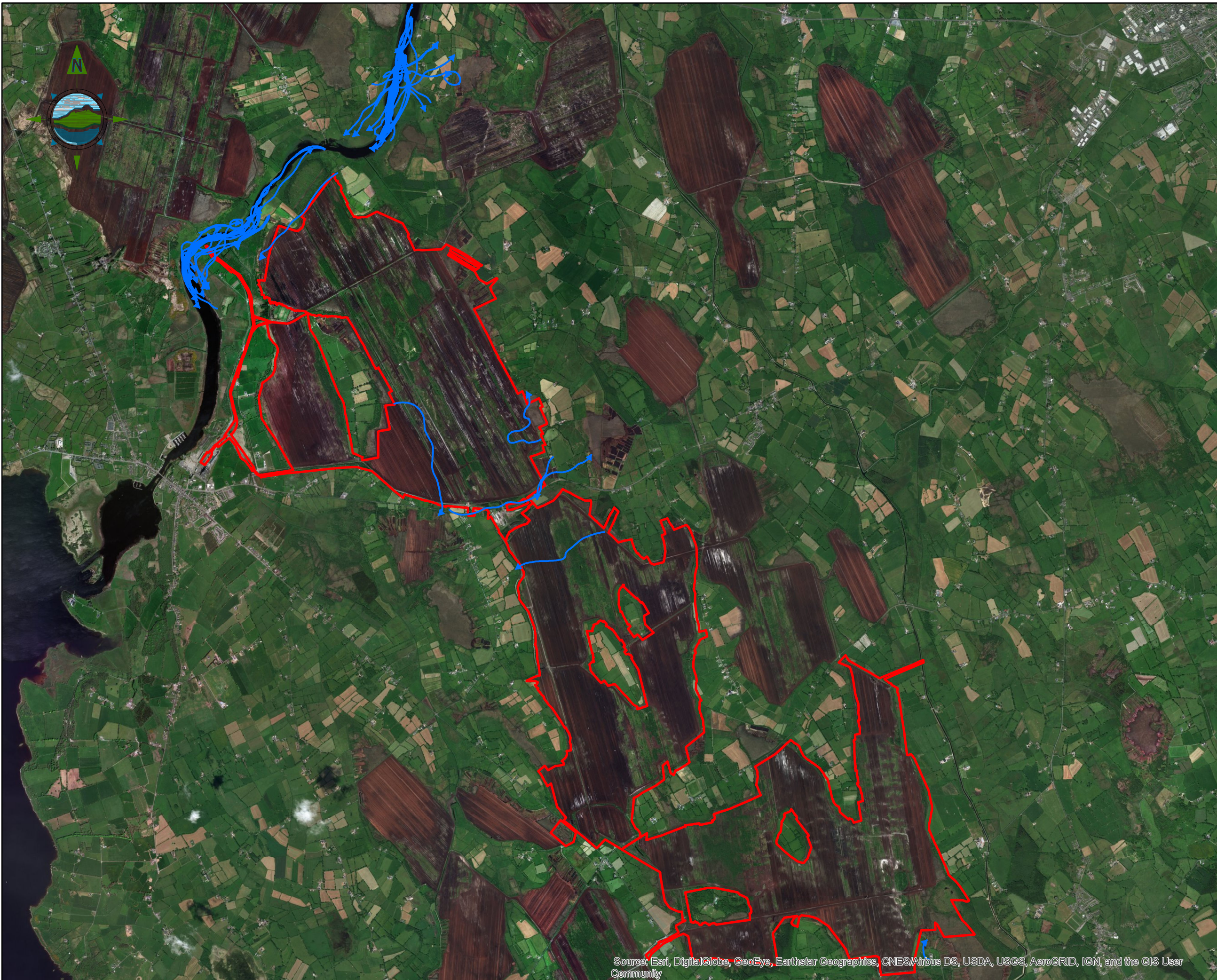
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Drawing No.:

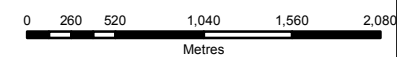
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Black Headed Gull Flightlines
- Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Black headed Gull Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Black headed Gull Flightlines

Scale @ A3: 1:44,511

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

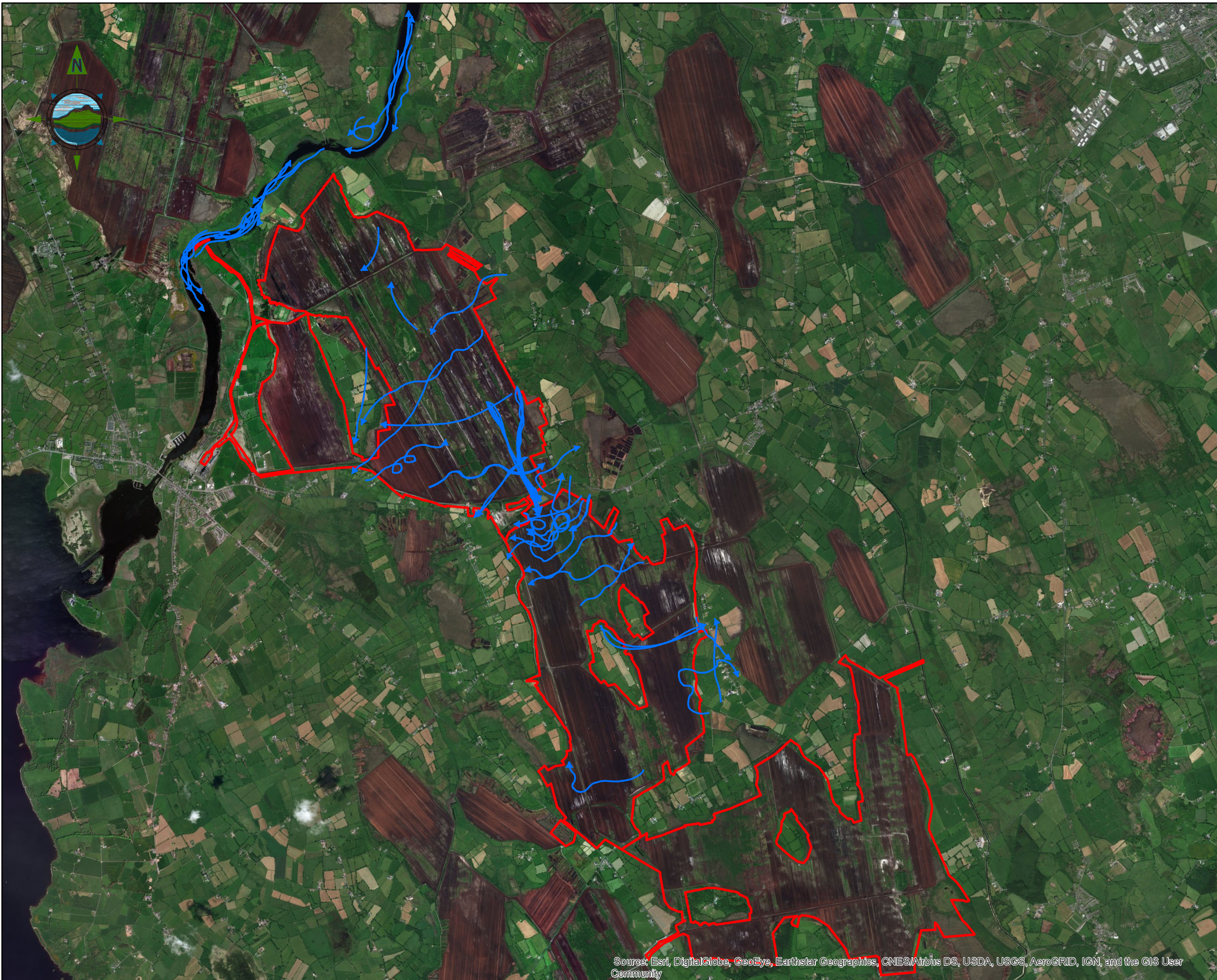
TOBIN
Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Issue: **A**

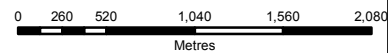
Drawing No.:

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Lesser Black-backed Gull Flightlines
-  Proposed Derryadd Wind Farm Site



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Lesser Black-backed Gull Flightlines	KD	PC

Client: Bord na Mona

Project: Derryadd Windfarm Winter Bird Surveys 2018

Title: Lesser Black-backed Gull Flightlines

Scale @ A3: 1:44,511

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan

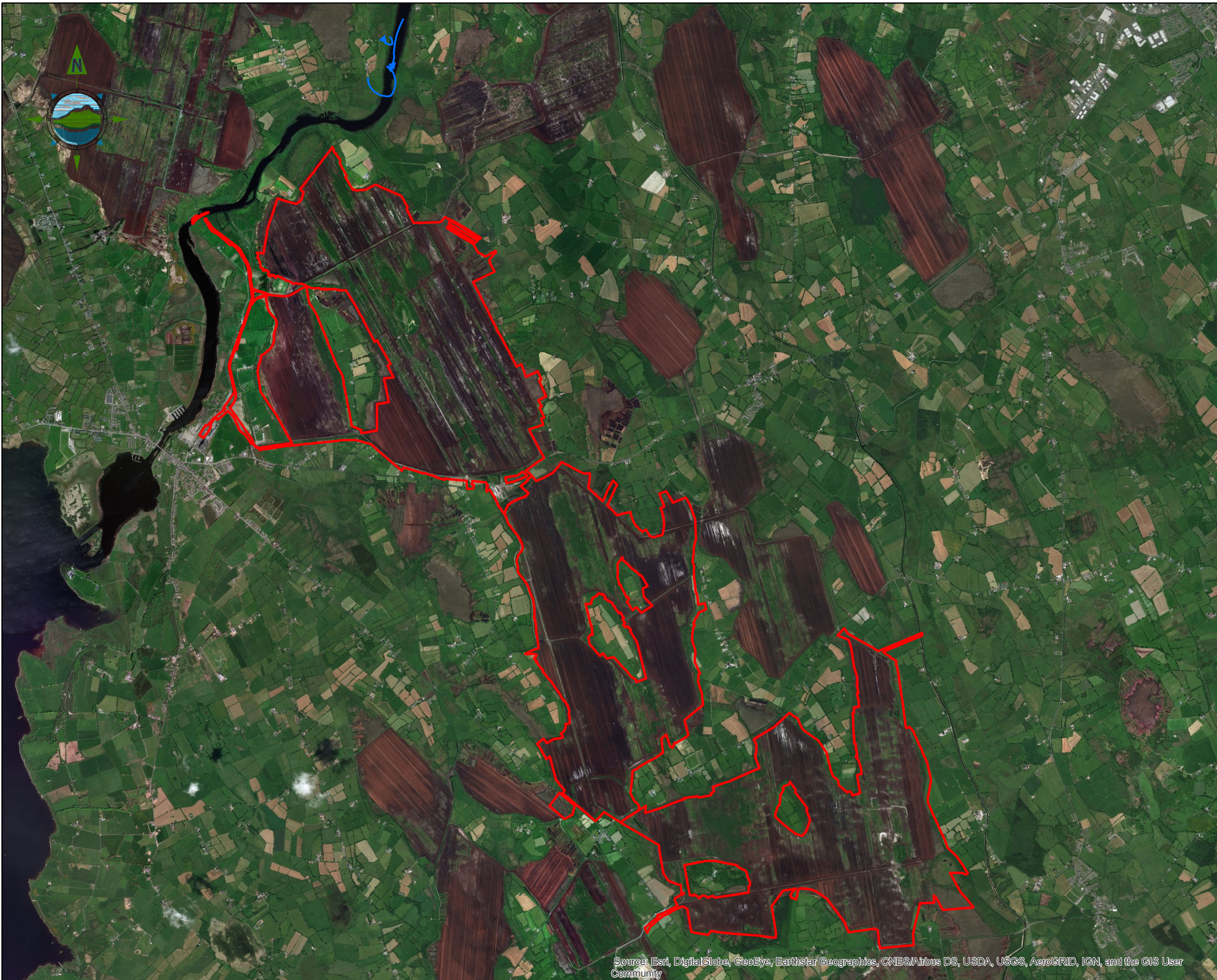


Consulting, Civil and Structural Engineers,
 Block 10-4, Blanchardstown Corporate Park,
 Dublin 15, Ireland.
 tel: +353-(0)1-8030406
 fax: +353-(0)1-8030409
 e-mail: info@tobin.ie
 www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

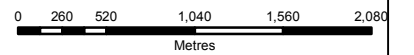
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Greater Black-backed Gull Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Greater Black-backed Gull Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Greater Black-backed Gull Flightlines

Scale @ A3: 1:44,511

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie



No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

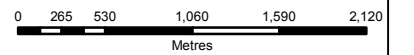
Drawing No.: Issue: **A**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Common Gull Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Common Gull Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Common Gull Flightlines

Scale @ A3: 1:46,011

Prepared by: kevin Delahunty Checked: Pdraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Drawing No.:

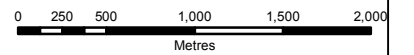
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Herring Gull Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Herring Gull Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Herring Gull Flightlines

Scale @ A3: 1:42,835

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



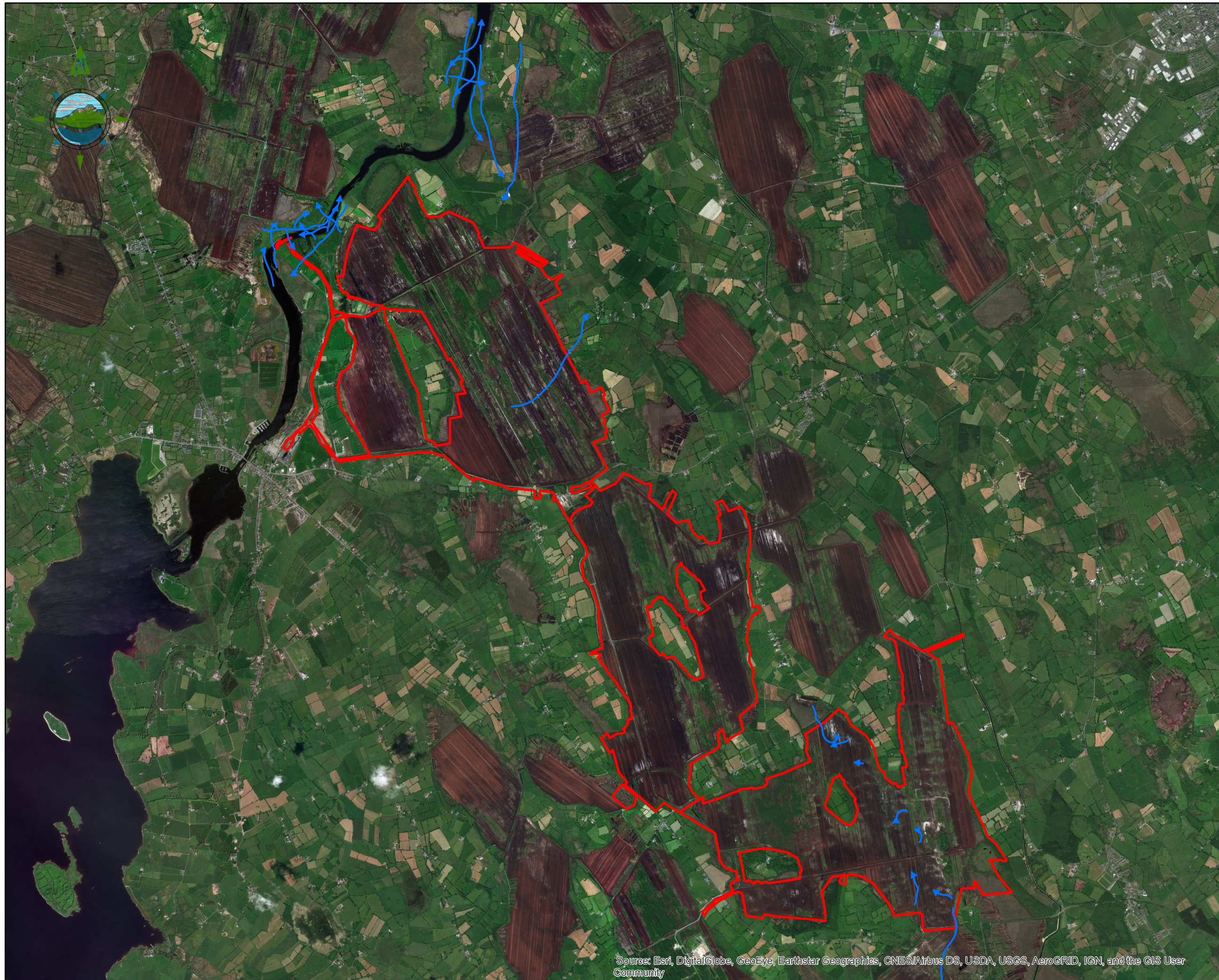
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Drawing No.:

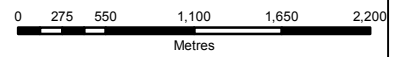
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Heron Flightlines
- Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Heron Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Heron Flightlines

Scale @ A3: 1:47,262

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.



Drawing No.:

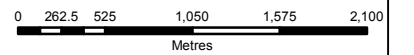
Issue:
A

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

-  Little Egret Flightlines
-  Proposed Derryadd Wind Farm Site



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	30/05/2018	Little Egret Flightlines	KD	PC

Client: Bord na Mona

Project:
Derryadd Windfarm Winter Bird Surveys 2018

Title: Little Egret Flightlines

Scale @ A3: 1:45,494

Prepared by: kevin Delahunty Checked: Padraig Cregg Date: 30/05/2018

Project Director: Damien Grehan



Patrick J. Tobin & Co. Ltd.
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

No part of this document may be reproduced or transmitted in any form or stored in any retrieval system of any nature without the written permission of Patrick J. Tobin & Co. Ltd. as copyright holder except as agreed for use on the project for which the document was originally issued.

Issue: **A**

Drawing No.:

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community