

Ornithology Report

Bord na Móna

**Winter ornithological survey for Lot No.1: Moundillon,
Derryarogue, Derryadd, Derraghan (Winter 2015/16)**



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1 INTRODUCTION

Malachy Walsh and Partners was commissioned by Bord na Móna to conduct ornithological surveys, over the winter 2015/2016 period, at a number of sites on Bord na Móna lands, in counties Longford and Roscommon. The following report gives a detailed account of the results of the ornithological surveys carried out during this time.

1.1 SCOPE OF ASSESSMENT

The purpose of the ornithological surveys was to record all bird species present within the various sites as well as record bird activity and site usage over the winter 2015/16 period. The area surveyed comprised eight individual sites, namely Moundillon, Derrycashel, Derryarogue, Derryadd, Lough Bannow, Derraghan, Derryshanoge and Derrycolumb, a group of Bord na Móna bogs known collectively as Lot No.1. Bird surveys were carried out between September 2015 and March 2016, inclusive.

2 METHODOLOGY

2.1 WINTER BIRD SURVEY

The survey methodology was designed so as to allow the winter bird community, both within the sites and in the surrounding areas, to be determined. Surveyors utilised methodologies proposed by Gilbert *et al.* (1998), Madders (2002), NPWS guidelines (Anon, 2003) and Percival (2003) and surveys were carried out with regard to guidelines produced by Scottish Natural Heritage in May 2014 (*Recommended bird survey methods to inform impact assessment of onshore wind farms*).

The objectives of the winter bird survey were to:

- Locate and identify all wintering birds present within the focal area
- Record avian activity and site-usage within the focal area
- Record any species of conservation concern and assess their status within the site

Two survey methods were employed, namely vantage point surveys and transect surveys.

2.1.1 Vantage Point Surveys

Vantage point surveys were carried out by suitably qualified personnel throughout the winter 2015/16 survey period (September to March inclusive). These surveys allowed for large study areas to be viewed from fixed points without the need to walk the field of view. The overall aim of these surveys was to establish the level of bird activity occurring within the sites. Vantage point surveys were carried out in accordance with NPWS guidelines (Appendix 4) and with regard to Scottish Natural Heritage survey recommendations (2014).

The main objectives were:

- To record usage of the sites by bird species, in particular raptors, waders, wildfowl, Annex 1 species and other species of conservation interest
- To observe the flight patterns and behaviour of key species potentially occurring within and around the vicinity of the survey area

During the vantage point surveys, any species of interest seen in the area was observed until it was lost from view. The flight patterns and behaviour of key species (raptors, wintering wildfowl and waders) occurring within the vicinity were recorded. Any observed flight path was mapped on OSI 1:50 000 mapping. During these observations the following information was recorded:

- The time that the bird was located and the duration of the observation;
- Sex and age of the bird(s) (adult/juvenile), where possible to determine
- Behaviour observed such as foraging, commuting or displaying;
- Estimation of flight height. Flight height was classified as <10m, 10 - 100m and >100m;
- Habitats used during flight observation period;
- Weather conditions at time of sighting.

The vantage point (VP) surveys were carried out at fifteen locations throughout the total survey area in order to assess the level of bird activity occurring. The location of each vantage point is marked on a map of the study area included in the figures in Appendix 1. During the winter survey period, September 2015 to March 2016 inclusive, each vantage point was watched for six hours per month, giving a total of 630 vantage point hours for the duration of the winter survey.

Winter Vantage Point surveys were undertaken on the following dates:

- September 8th, 9th, 10th, 11th, 12th, 15th, 16th, 17th, 18th, 22nd, 23rd, 24th, 30th 2015
- October 6th, 9th, 12th, 13th, 14th, 15th, 16th, 19th, 20th, 22nd, 23rd 2015
- November 4th, 5th, 11th, 12th, 17th, 18th, 19th, 20th, 24th, 28th, 29th 2015
- December 2nd, 3rd, 4th, 6th, 7th, 8th, 9th, 10th, 14th, 15th, 16th, 20th 2015
- January 6th, 7th, 8th, 13th, 14th, 15th, 19th, 20th, 21st, 22nd, 26th, 27th, 28th 2016
- February 2nd, 3rd, 4th, 5th, 9th, 10th, 11th, 12th, 16th, 17th, 18th, 19th, 24th, 25th 2016
- March 7th, 9th, 10th, 11th, 14th, 15th, 16th, 18th, 23rd, 24th, 25th, 29th, 30th, 31st 2016

2.1.2 Transect Surveys

A transect survey is a walkthrough of a specific area of the site with surveyors following a defined route. A transect may comprise a single route through a particular part of the site, or it may comprise a number of routes, depending on the site-specific habitats and site topography. Transect surveys were carried out on two site visits during the winter 2015/2016 period; one early in the season (November 2015) and a second survey later in the season (March 2016). During each of these transect surveys a total of fifteen transect routes were walked, giving a total of thirty transects completed during the winter 2015/16 period. Transect routes can be viewed in Appendix 1.

The overall aim of the transect surveys was to record all bird species encountered (seen or heard) within a 100m band along each transect route. Methodology followed that of the Countryside Bird Survey, devised and employed by Birdwatch Ireland (CBS, 2012).

The objectives of the surveys were:

- To locate and identify all wintering birds present within the site
- To record any species of conservation concern

2.1.3 Surveyors

The following competent experts carried out ornithological surveys over the winter 2015/16 period:

- John Murphy (Senior Ecologist/Ornithologist);
- Joe Adamson (B.Sc., M.Sc., MCIEEM Senior Ecologist);
- Austin Cooney (Ornithologist)
- Caroline Lalor (Ecologist)
- Hazel Tough (Ecologist)

2.2 DESK STUDY

In addition to the bird survey work carried out on site, relevant bird records for the preceding twenty years were obtained. The main sources of information were:

- Irish Bird Reports and the journal *Irish Birds*, published by BirdWatch Ireland
- Birds in Central Ireland – Mid Shannon Bird Report - reports were available for the following periods: 1992-1995, 1996-1999, 2000-2003, 2004-2007 and 2008-2011 (S. Heery)
- Ireland's Wetlands and their Waterbirds, Status and Distribution. BirdWatch Ireland, Newcastle, Co. Wicklow (O. Crowe, 2005)
- Greenland White-fronted 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 (A.D. Fox, D.W. Norriss, D.A. Stroud, & H.J. Wilson, 1994)
- Documented bird records available on the NPWS online mapping system (www.npws.ie)
- Documented bird records available from the National Biodiversity Data Centre website (www.biodiversityireland.ie)

3 EXISTING ENVIRONMENT

3.1 CHARACTERISTICS OF THE PROPOSAL

Bord na Móna has commissioned winter bird surveys relating to the potential development of wind energy projects across a range of bog groups (known individually as Lots). Malachy Walsh and Partners was commissioned to conduct such surveys at a bog group known as Lot No.1. The study area under consideration in this ornithological report comprised four main sites on Bord na Móna lands, comprising eight individual bogs, which together make up Lot No.1.

3.2 SITE LOCATION/DESCRIPTION

Lot No.1 consists of four main sites which are comprised of eight individual bogs in total, namely Moundillon, Derrycashel, Derryarogue, Derryadd, Lough Bannow, Derraghan, Derryshanoge and Derrycolumb. All are located within the Irish Midlands in the counties of Roscommon and Longford. See Appendix 1 for a map of the locations of the various bog groups.

The dominant habitat type throughout the overall site is cutover bog which occurs extensively throughout the survey area. Most areas of the site are in continuous peat production; therefore overall the site offers little in the way of habitat diversity. Discrete sections of woodland (both broadleaf and conifer) occur within the site, particularly at the edge of cutaway areas. Many areas of cut-over envelop linear strips of willow and other species occurring along drainage ditches. The margins of cutaway areas often comprise some remnant raised bog vegetation, dominated by ling heather (*Calluna vulgaris*).

3.2.1 Moundillon/Derrycashel

This site is located in county Roscommon, approximately 2 ½ km north of Lanesborough and to the west of the River Shannon. The site exhibits a mosaic of bare peat, scrub and cutaway habitats. Large areas of the site are out of production and re-colonisation of bare peat, in the form of willow (*Salix* sp.) and birch (*Betula pubescens*) scrub is evident in parts. Vantage point 1 (VP1) covers Derrycashel Bog which has an approximate area of 380 hectares. Vantage points 2 and 3 (VP2 and VP3) cover Moundillon Bog which has an approximate area of 580 hectares.

3.2.2 Derryarogue

Derryarogue Bog is found in county Longford, northeast of the town of Lanesborough with the N63 National Road located to the south. The site is situated to the east of the River Shannon which is located approximately 400m from the northern and western boundaries, at its closest point. For the most part the site is bordered by farmland although a Coillte forest occurs at the northwest boundary of the site. There are significant areas of bare peat within the site boundary. Vantage points VP4, VP5 and VP6 cover Derryarogue Bog which has an approximate area of 840 hectares.

3.2.3 Derryadd/Lough Bannow

These sites are located in county Longford to the southeast of Lanesborough town. The area is located to the south of the N63 National Road and to the north of the R392 Regional Road. The site consists of large areas of bare peat and a mixture of scrub and conifer woodland. Vantage points VP7 and VP8 are located in Derryadd Bog. There are two sections (totalling approximately 41 hectares), towards the centre of this bog, that are not part of Bord na Móna lands. Vantage points VP8, VP12 and VP15 are situated in Lough Bannow Bog. There are two sections (totalling approximately 50

hectares), towards the west and northern parts of this bog, that are also not part of Bord na Móna lands. These areas comprise farmland and associated dwellings.

3.2.4 Derryaghan/Derryshanoge/Derrycolumb

The Derraghan/Derryshanoge/Derrycolumb complex is also located in county Longford, to the south of the R392 Regional Road. The site is located 4-5km to the east of Lough Ree and Newtowncashel is situated approximately 2km to the west. The site is predominantly bare peat with some birch woodland. Areas of bare peat are bounded by hedgerows, scrub and/or woodland. Derraghan Bog is covered by vantage point VP13 and has an approximate area of 300 hectares. Derryshanoge Bog is covered by vantage points VP9, VP10, VP11 and VP13. This site has an approximate area of 440 hectares. Derrycolumb Bog is situated at the southern extremity of the study area. It is covered by vantage point VP14 and has an approximate area of 360 hectares.

3.3 DESIGNATED SITES

3.3.1 European Designated Sites

3.3.1.1 Special Areas of Conservation (SAC)

The European Union Habitats Directive (Directive 92/43/EEC) requires Member States to designate areas for the protection of certain habitats and species, considered to be of Community importance and as listed in Annex I and Annex II of the Directive. These areas are known as Special Areas of Conservation (SACs) and are afforded strict legal protection. The Habitats Directive established the Natura 2000 network which is a network of nature conservation areas extending throughout Europe. There are six SACs within 10km of the project site, as outlined in Table 1 below.

3.3.1.2 Special Protection Areas

The European Union Directive on the Conservation of Wild Birds, known as the Birds Directive (Directive 2009/147/EC) requires Member States to designate legally-protected areas for the conservation of endangered or migratory species of birds, as listed on Annex I of the Directive. These areas are called Special Protection Areas (SPAs) and since 1994 all SPAs also form part of the Natura 2000 network of protected sites. There are two SPAs within 10km of the project site, as outlined in Table 1 below; Lough Ree SPA (004064) located 330m to the south of Derraghan Bog, at its closest point and Ballykenny-Fisherstown Bog SPA (004101), located 3.15km east of Mountdillon.

Both the EU Birds and Habitats Directives are implemented in Irish law under the European Communities (Birds and Natural Habitats) Regulations 2011.

3.3.2 Nationally Designated Sites

Under Irish legislation, sites considered to be of national importance in terms of nature conservation are designated as Natural Heritage Areas (NHAs) under the Wildlife Act (1976) and the Wildlife Amendment Act (2000). There are currently many additional sites throughout the country which are proposed as Natural Heritage Areas (pNHAs). However a consultative process with affected landowners is currently ongoing and until this is completed these pNHA sites are not subject to legal protection. There are seven NHAs and thirteen pNHAs situated within 10 km of the study area boundary. Six of the pNHA sites overlap with SACs, as outlined in Table 1 below.

Table 1. Designated sites within 10km of the study area

Site Name (Site Code)	Features of Interest	Proximity to the study area at the closest point
Lough Ree SPA (004064)	<ul style="list-style-type: none"> • 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] 	<p>330m to the south of Derraghan Bog</p> <p>540m south west of the study area (Lanesborough)</p>
Ballykenny-Fisherstown Bog SPA (004101)	<ul style="list-style-type: none"> • Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] 	3.15km east of Mountdillon
Fortwilliam Turlough SAC and pNHA (000448)	<ul style="list-style-type: none"> • Turloughs [3180] 	1.88km west of the site
Lough Ree SAC and pNHA (000440)	<ul style="list-style-type: none"> • Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) [6210] • Degraded raised bogs still capable of natural regeneration [7120] • Alkaline fens [7230] • Limestone pavements [8240] • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] • Bog woodland [91D0] • <i>Lutra lutra</i> (Otter) [1355] 	<p>330m to the south of Derraghan Bog</p> <p>540m south west of the study area (Lanesborough)</p>
Corbo Bog SAC and pNHA (002349)	<ul style="list-style-type: none"> • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] 	4.9km south west of Mountdillon
Brown Bog SAC and pNHA (002348)	<ul style="list-style-type: none"> • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] 	5.9km east of Mountdillon
Lough Forbes Bog Complex SAC and pNHA (001818)	<ul style="list-style-type: none"> • Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150] • Active raised bogs [7110] 	3.15km east of Mountdillon

Site Name (Site Code)	Features of Interest	Proximity to the study area at the closest point
	<ul style="list-style-type: none"> • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] 	
Clooneen Bog SAC and pNHA (002348)	<ul style="list-style-type: none"> • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] • Bog woodland [91D0] 	6.3km north east of Mountdillon
Forthill Bog NHA (001448)	<ul style="list-style-type: none"> • Raised bog 	710m south west of Derraghan
Mount Jessop Bog NHA (001450)	<ul style="list-style-type: none"> • Raised bog 	3.8km north east of Derryadd
Lisnarrigh Bog NHA (002072)	<ul style="list-style-type: none"> • Raised bog 	5.65km west of Derryarogue
Derrycanan Bog NHA (000605)	<ul style="list-style-type: none"> • Raised bog 	7.2km west of Mountdillon
Rinn River NHA (000691)	<ul style="list-style-type: none"> • The close proximity to the River Shannon Callows and Lough Forbes Complex SACs increases the ecological interest and scientific value of the site • The Rinn River provides a corridor for the movement of plants and animals between Lough Rinn (also an NHA) and Lough Forbes • Flooding callows • Raised bog • There is also a semi-natural margin between Rinn River and Ballageeher Bog, which is of ecological importance 	7.6km north east of Mountdillon
Aghnamona Bog NHA (000422)	<ul style="list-style-type: none"> • Raised bog 	8.35km north east of Mountdillon
Cloonageeher Bog NHA (001423)	<ul style="list-style-type: none"> • Raised bog 	9.6km north east of Mountdillon
Derrymore Bog pNHA (000447)	<ul style="list-style-type: none"> • Bogs 	6.7km east of Derryadd
Lough Bannow pNHA (000449)	<ul style="list-style-type: none"> • Lake / reed / wetland / marshes and wet, inundated grasslands / waterbirds / plant species 	Adjacent to Derryarogue, 100m south of the site at its nearest point
Kilglass and Grange Loughs pNHA (000608)	<ul style="list-style-type: none"> • Group of lakes / calcareous / reedswamps / freshwater marshes / very wet grassland on peat / winter waterfowl / birds / remote reedbeds 	7.1km north of Mountdillon
Cordara Turlough pNHA (001821)	<ul style="list-style-type: none"> • Turlough / carboniferous limestone / rare habitats / wildfowl 	850m west of Derraghan

Site Name (Site Code)	Features of Interest	Proximity to the study area at the closest point
Lough Bawn pNHA (001819)	<ul style="list-style-type: none"> • Lake / bog, fen, wet and dry woodland / freshwater marsh habitats / birds 	Partially within in the study area at Derryadd
Royal Canal pNHA (002103)	<ul style="list-style-type: none"> • Hedgerow / calcareous grassland / reed fringe / open water / scrub / woodland 	Flows along the eastern boundary of the site, 220m away at its closest point
Derry Lough pNHA (001444)	<ul style="list-style-type: none"> • Wet grassland / fen / fen woodland / open water 	Adjacent to Derraghan

3.3.3 Internationally Designated Sites

3.3.3.1 Ramsar Sites

The Convention on Wetlands, also known as the Ramsar Convention, is an intergovernmental treaty which aims to conserve and protect wetlands and their resources around the world¹. The desk-top review concluded that there are no Ramsar sites within 10km of the study area.

3.3.3.2 Important Bird and Biodiversity Areas (IBAs)

The Important Bird and Biodiversity Areas (IBAs) Programme, overseen by Birdlife International, aims to identify, conserve and protect those areas throughout the world considered to be of the greatest significance to bird populations². There is one IBA in the vicinity of the study area; Lough Ree IE128. This site is located 330m to the south of Derraghan Bog at its closest point and 540m south west of the study area near Lanesborough. The following is taken from the Birdlife International website: 10,788 ha of the Lough Ree IE128 site are covered by a Special Protection Area (Lough Ree SPA, 10,788 ha). Lough Ree is the third-largest lake in Ireland, and is situated on the River Shannon system between Lanesborough and Athlone. The shoreline, with many indented bays, has extensive reedbeds, callow and lowland wet grassland. Land-uses include low-intensity grazing on the grasslands, angling and other recreational uses³.

¹ <http://www.ramsar.org/> [Accessed 12/01/2016]

² <http://www.birdlife.org/worldwide/programmes/important-bird-and-biodiversity-areas-ibas> [Accessed 12/01/2016]

³ <http://www.birdlife.org/datazone/sitefactsheet.php?id=651> [Accessed 12/01/2016]

4 WINTER 2015/2016 RESULTS

4.1 VANTAGE POINT SURVEY RESULTS

A total of 68 species were recorded during the winter (2015/2016) vantage point surveys. Table 2 below provides details of all species recorded throughout the survey period. Species names are colour-coded, in line with the standard 'traffic-light system', used to indicate conservation status in Ireland. Species highlighted in red represent species that are 'red-listed' (considered to be of high conservation concern); species highlighted in orange represent species that are 'amber-listed' (considered to be of lesser conservation concern but still with an unfavourable conservation status). Remaining species, which are 'green-listed', are considered to have a favourable conservation status (Calhoun and Cummins, 2013). Additionally, many species are considered to be of unfavourable conservation status in a European context. These species, as well as migratory species, are listed on Annex 1 of the EU Birds Directive (Directive 2009/147/EC). They are afforded strict protection and their presence requires the designation of areas as Special Protection Areas (SPAs). Annex 1 species are denoted with an asterisk (*) and highlighted in bold in the results table below.

Table 2. Species total counts per month - Winter 2015/2016 period

Common Name	Scientific Name	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	Peak Monthly Count	Mean Monthly Count
Arctic Redpoll	<i>Carduelis hornemanni/exilipes</i>	0	0	1	0	0	0	0	1	0
Barnacle goose*	<i>Branta leucopsis</i>	0	0	0	13	0	0	0	13	1
Blackbird	<i>Turdus merula</i>	35	64	94	59	112	91	94	112	78
Blackcap	<i>Sylvia atricapilla</i>	5	0	0	0	0	0	0	5	0
Black-headed gull	<i>Chroicocephalus ridibundus</i>	0	0	0	0	0	0	3	3	0
Blue tit	<i>Cyanistes caeruleus</i>	2	20	35	18	35	14	19	35	20
Bullfinch	<i>Pyrrhula pyrrhula</i>	2	6	16	2	17	6	2	17	7
Buzzard	<i>Buteo buteo</i>	20	5	1	2	5	4	28	28	9
Chaffinch	<i>Fringilla coelebs</i>	31	62	143	78	93	102	159	159	95
Chiffchaff	<i>Phylloscopus collybita</i>	2	0	1	0	1	1	0	2	0
Coal tit	<i>Periparus ater</i>	10	10	31	12	39	16	21	39	19
Cormorant	<i>Phalacrocorax carbo</i>	0	0	0	0	1	2	8	8	1
Crossbill	<i>Loxia curvirostra</i>	0	0	2	2	2	3	11	11	2
Curlew	<i>Numenius arquata</i>	0	1	0	0	0	0	0	1	0
Dunnock	<i>Prunella modularis</i>	2	9	27	16	27	29	40	40	21
Fieldfare	<i>Turdus pilaris</i>	0	65	254	59	151	170	32	254	104
Goldcrest	<i>Regulus regulus</i>	6	11	28	7	19	9	14	28	13
Golden plover*	<i>Pluvialis apricaria</i>	0	25	9	85	182	0	535	535	119
Goldfinch	<i>Carduelis carduelis</i>	17	73	61	31	6	1	5	73	27
Great tit	<i>Parus major</i>	8	9	10	6	12	12	10	12	9
Greenfinch	<i>Carduelis chloris</i>	2	2	13	10	0	0	2	13	4
Greenland White-fronted goose*	<i>Anser albifrons flavirostris</i>	0	0	3	0	0	0	0	3	0

Common Name	Scientific Name	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	Peak Monthly Count	Mean Monthly Count
Grey heron	<i>Ardea cinerea</i>	0	2	0	0	1	1	2	2	0
Greylag Goose	<i>Anser anser</i>	0	0	0	0	1	0	0	1	0
Hen Harrier*	<i>Circus cyaneus</i>	1	0	0	2	3	0	0	3	0
Hooded crow	<i>Corvus cornix</i>	53	99	116	62	79	101	94	116	86
House Martin	<i>Delichon urbicum</i>	2	0	0	0	0	0	0	2	0
House Sparrow	<i>Passer domesticus</i>	0	0	0	0	2	2	0	2	0
Jackdaw	<i>Corvus monedula</i>	107	102	387	108	184	288	187	387	194
Jay	<i>Garrulus glandarius</i>	0	0	0	1	0	0	1	1	0
Kestrel	<i>Falco tinnunculus</i>	6	12	8	2	4	4	10	12	6
Kingfisher	<i>Alcedo atthis</i>	0	0	0	0	1	0	0	1	0
Lapwing	<i>Vanellus vanellus</i>	0	0	13	11	0	0	0	13	3
Lesser black-backed gull	<i>Larus fuscus</i>	0	0	0	0	0	0	75	75	10
Linnet	<i>Carduelis cannabina</i>	26	23	45	32	4	4	7	45	20
Long tailed tit	<i>Aegithalos caudatus</i>	6	21	61	43	30	23	8	61	27
Magpie	<i>Pica pica</i>	44	63	50	24	55	41	30	63	43
Mallard	<i>Anas platyrhynchos</i>	0	0	27	55	18	0	29	55	18
Merlin*	<i>Falco columbarius</i>	0	3	2	4	3	1	1	4	2
Meadow pipit	<i>Anthus pratensis</i>	179	59	101	26	34	48	148	179	85
Mistle thrush	<i>Turdus viscivorus</i>	13	7	24	16	8	16	17	24	14
Mute Swan	<i>Cygnus olor</i>	0	0	0	4	2	0	2	4	1
Peregrine falcon*	<i>Falco peregrinus</i>	0	0	1	0	1	0	0	1	0
Pheasant	<i>Phasianus colchicus</i>	5	6	6	5	4	7	15	15	6
Pied wagtail	<i>Motacilla alba</i>	23	50	39	6	9	12	23	50	23
Raven	<i>Corvus corax</i>	40	41	26	7	21	19	23	41	25
Redpoll	<i>Carduelis flammea</i>	27	30	142	85	60	23	18	142	55
Redwing	<i>Turdus iliacus</i>	0	39	364	160	247	400	60	400	181
Reed bunting	<i>Emberiza shoenicus</i>	11	37	71	31	49	30	19	71	35
Robin	<i>Erithacus rubecula</i>	39	72	89	43	73	89	105	105	72
Rook	<i>Corvus frugilegus</i>	131	197	427	85	216	265	176	427	213
Sand martin	<i>Riparia riparia</i>	4	0	0	0	0	0	0	4	0
Siskin	<i>Carduelis spinus</i>	6	0	8	1	5	0	10	10	4
Skylark	<i>Alauda arvensis</i>	2	4	1	0	3	3	8	8	3
Snipe	<i>Gallinago gallinago</i>	1	3	16	4	6	2	6	16	5
Song thrush	<i>Turdus philomelos</i>	6	10	12	7	11	16	18	18	11
Sparrowhawk	<i>Accipiter nisus</i>	0	2	3	3	3	4	3	4	2
Starling	<i>Sturnus vulgaris</i>	161	99	1,038	342	687	912	363	1,038	514
Stonechat	<i>Saxicola torquatus</i>	4	14	12	6	4	4	17	17	8
Swallow	<i>Hirundo rustica</i>	660	0	0	0	0	0	0	660	94
Teal	<i>Anas crecca</i>	0	0	0	25	6	1	0	25	4
Water Rail	<i>Rallus aquaticus</i>	0	0	0	0	1	0	0	1	0
Wheatear	<i>Oenanthe oenanthe</i>	5	5	0	0	0	0	0	5	1
Whooper swan*	<i>Cygnus cygnus</i>	0	3	12	26	144	78	13	144	39
Willow warbler	<i>Phylloscopus trochilus</i>	3	0	0	0	0	0	0	3	0
Woodcock	<i>Scolopax rusticola</i>	0	0	0	0	1	0	0	1	0
Woodpigeon	<i>Columba palumbus</i>	21	41	195	50	69	45	73	195	70
Wren	<i>Troglodytes</i>	24	55	70	44	42	53	74	74	51

Common Name	Scientific Name	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	Peak Monthly Count	Mean Monthly Count
	<i>trogodytes</i>									
Total Species		42	42	47	46	53	42	48		

Note: Annex 1 species are denoted with an asterisk (*) and highlighted in bold

Bird species recorded during the winter vantage point surveys are considered typical of the habitats present within and adjacent to the site. Of the 68 species, there were six raptor species, namely buzzard (*Buteo buteo*), hen harrier (*Circus cyaneus*), kestrel (*Falco tinnunculus*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*) and sparrowhawk (*Accipiter nisus*). There were six red listed species, twenty-seven amber listed species and six Annex I species, protected under the EU Birds Directive, observed during the vantage point surveys. Annex I species included three species of raptor namely hen harrier, merlin and peregrine along with whooper swan (*Cygnus Cygnus*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and golden plover (*Pluvialis apricaria*).

The most abundant species recorded overall, throughout the winter 2015/16 vantage point surveys, was starling (*Sturnus vulgaris*), with a peak count of 1,038 recorded in November 2015. Starlings were recorded on almost every survey day during this month. The largest flock was observed at VP14 when 468 birds were counted. The mean count for starlings was also the highest for all recorded species, with an average of 514 birds per month. Starling is amber listed in Ireland due to a moderate recent decline in large parts of its European population. The Irish population is currently stable⁴. The next most abundant species observed was swallow with a peak count of 660 recorded in September 2015. The average number of swallows recorded per month was 94, as per Table 2 above. The largest single daily record for swallow was ninety birds recorded on the 8th September 2015 at VP6 when a steady stream of birds was observed moving southwards throughout the duration of the watch. It is likely that this group was utilising the River Shannon as a flyway on their southward journey. Such movements southward by swallows at this time of year would be highly typical of the species in preparation for annual migration to wintering grounds in South Africa and would occur throughout the country. Therefore it is likely that the flock observed on 8th September represented a pre-migratory gathering, as is typical of the species during autumn. This group may possibly have bred in the general area or roosted nearby or indeed at some other location to the north of the site. Swallow is an amber-listed species in Ireland due to concerns over declines in the European population⁵.

4.1.1 Raptor Vantage Point Observations

Six raptor species were observed while carrying out winter 2015/16 vantage point surveys, namely hen harrier, kestrel, sparrowhawk, peregrine falcon, buzzard and merlin. Tabulated summaries of all observations of these species are available in Appendix 2. Flight paths for each species are available in Appendix 3.

⁴ <http://www.birdwatchireland.ie/IrelandsBirds/Starling/tabid/446/Default.aspx> [Accessed 02/05/2016]

⁵ <http://birdwatchireland.ie/IrelandsBirds/SwallowMartins/Swallow/tabid/1034/Default.aspx> [Accessed 02/05/2016]

4.1.1.1 Hen harrier

Hen harriers (*Circus cyaneus*) prey on a variety of small birds and mammals. The species breeds in the uplands with favoured breeding habitat comprising young forestry plantation, although they will also nest in moorland heather. In winter, hen harriers are more widespread and can be found in lowland areas. Due to a decline in the breeding population hen harrier is Amber-listed in Ireland. Additionally, they are listed on Annex I of the EU Birds Directive due to historic declines in the European population⁶. Six observations of hen harriers were made while carrying out the winter 2015/16 vantage point surveys, three of which were from VP1. There follows a brief summary of these observations.

On the 24th September an immature bird (possibly a second-calendar year male) was observed from VP1, foraging low over an area of depleted raised bog and willow scrub. The bird was tagged on the right-wing. On the 16th December a wing-tagged bird was recorded from the same VP, presumably the same bird, hunting over vegetation in the middle of the site, east of the VP location. On the 26th January a wing-tagged hen harrier, again believed to be the same bird, was observed from VP1, hunting along the road to the north-east of the site. The individual was harassed by a kestrel for a short period after which it continued hunting low to the ground.

Hen harrier was also recorded at VP12 when on the 3rd December a female was observed flying in low over the VP location before moving off over trees to the south-west of the site. On the 20th January, during VP 5, a male hen harrier flew in from the south-east of the site. It flew low over regenerating cutover bog and rough pasture, hunting along a boundary between cutaway bog and a tree-line before flying off out of view in a north-westerly direction. The final observation of hen harrier occurred on the 26th January at VP2 when an adult female was observed hunting over woodland while flying in a westerly direction.

4.1.1.1.1 Summary of Hen Harrier Observations

In summary there were six observations of hen harriers in total over the winter 2015/16 survey period. These sightings occurred in the months of September, December and January. The peak count was recorded in January when three hen harriers were recorded. The majority of sightings (three) were from VP1 with the remaining three occurring at VPs 12, 5 and 2. All observations were of birds flying at <10 metres in height with the longest single flight observation lasting approximately 240 seconds. All observations were of single birds displaying typical hunting/foraging behaviour. There follows a breakdown of the duration of all hen harrier observations as a percentage of the total survey time.

⁶ <http://birdwatchireland.ie/IrelandsBirds/Raptors/HenHarrier/tabid/394/Default.aspx> [Accessed 14/01/16]

Table 3: Duration of hen harrier observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	0	0
Height <10m	585	0.03
Height 10-100m	0	0
Height >100m	0	0
Total	585	0.03

4.1.1.2 Merlin

Merlin (*Falco columbarius*) is a rare breeding bird in Ireland. The species nests on the ground in upland habitats such as moorland and blanket bog. It may also nest in woodland and has taken to nesting in forestry plantations adjacent to moorland areas. The species has a much wider distribution during the winter months, moving from uplands to coastal areas, where concentrations of birds provide ample opportunity for hunting. The species requires large, open areas in which to hunt, often perching at height in order to spot prey on the ground. Due to a small breeding population merlin is amber-listed in Ireland and is also listed as an Annex I species⁷.

There were thirteen separate observations of merlin over the course of the seven month survey period. Three of these were from VP1 with a further three from VP11. There were two observations of merlin from VP15 as well as single observations from VPs 3, 7, 9, 12 and 14. There follows a brief summary of these observations.

There were three observations of merlin during October 2015. On the 9th October a female was observed from VP14 flying low over the bog in a north-westerly direction. The bird flew at <10m height before perching on a peat mound. Following this the bird dropped out of view. On the same day a female was also observed from VP15, flying in an easterly direction to the south-west. This bird was also observed flying low over the bog, at a height <10m, before going out of view behind a peat mound. On the 15th October a female was observed from VP11 flying low over the bog in a westerly direction. On the 19th November, during VP11, an adult female was observed perched on a peat mound to the north of the VP location. This bird remained perched for 780 seconds before going out of view behind a peat mound.

⁷ <http://birdwatchireland.ie/IrelandsBirds/Raptors/Merlin/tabid/398/Default.aspx> [Accessed 14/01/2016]

There were four observations of merlin during December 2015. On the 2nd December a juvenile female was observed from VP12 sitting on a peat mound in the middle of the site. The bird was observed for some time before flying off low (2m height) towards the north-east of the site. On the 7th December an adult male was observed from VP11 sitting on a peat mound. The bird alighted almost immediately, flying in a westerly direction approximately 2m above the ground, before disappearing out of sight behind the mound. On the 15th December, during VP1, a juvenile male flew in from the north hunting over open bog. This bird flew between 1-3 metres above the ground, to the east of the VP and the road, moving south over cutover bog. The following day an immature bird was observed from VP1. This bird came into view from the north of the site, flying low (1m height) hunting over a flooded area of the bog. After sixty seconds it moved off in a southerly direction. Merlin was recorded on three occasions during January 2016. On the 6th January a merlin was observed from VP15. This bird flew in from the south at a height of 3-4m, heading over the bog in a northerly direction at a height of 1 metre above the ground. On the 14th January at VP9 adult female perched on peat mound for four minutes before flying to the north-west over the bog at approximately 2 metres height. Finally on the 27th January an adult male was seen from VP3 hunting very low over open bog to the east of the VP location.

There were only single monthly sightings of merlin during February and March 2016. These records comprised an adult male, observed from VP1, which flew onto the site hunting having come from a northerly direction. On the 9th March an adult female was observed hunting low above the ground (<1 metre height) heading westwards along the road/railway line from VP7.

4.1.1.2.1 Summary of merlin observations

In summary there were thirteen observations of merlin over the winter 2015/16 survey period. Merlin was recorded in every survey month except September. The peak count for this species was recorded in December when four birds were recorded. The majority of sightings were from VP1 and VP11. All flight observations were of birds flying at <10 metres in height with the longest single observation lasting approximately 60 seconds. All observations were of single birds typically displaying hunting/foraging behaviour although on several occasions birds were observed sitting resting on peat mounds, the longest observation of which lasted 780 seconds. There follows a breakdown of the duration of all merlin observations as a percentage of the total survey time.

Table 4: Duration of merlin observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	1,336	0.06
Height <10m	467	0.02
Height 10-100m	0	0

Flight category	Time (sec)	Percentage (%)
Height >100m	0	0
Total	1,803	0.08

4.1.1.3 *Peregrine*

Peregrine is both a coastal and upland species, utilising both habitat types for hunting and breeding. In Ireland, breeding sites are mainly located on cliffs, either in coastal or inland mountainous areas (Moore, et al., 1992). During the breeding season, peregrines will hunt in the vicinity of the nest-site. However, during the winter months, peregrines will often move to areas with high concentrations of prey, such as coastal estuaries which offer congregations of wintering water-birds. Historically, peregrine populations have undergone major declines on a global scale due largely to unintentional poisoning from widespread pesticide use and to a lesser extent deliberate persecution. However, due to increases in the peregrine population the species is no longer considered to be of unfavourable conservation concern. Peregrine is classed as 'Least Concern' on the European Red List for birds and is green-listed in Ireland (Colhoun & Cummins, 2013). Peregrine are listed as an Annex I species under the EU Birds Directive (2009/147/EEC).

There were two separate observations of peregrine during the winter 2015/16 survey period. On the 12th November, during VP7, an adult male was observed sitting on a peat mound in the north of the site, adjacent to a large body of standing water. This bird flew low over the water (<10m height) disturbing a female mallard sitting on the water. The bird was seen to return to the peat mound before flying out over the water again, attacking the mallard. This behaviour continued for 600 seconds before the peregrine tired and landed on rushes at the water's edge. During this observation the peregrine consistently flew at a height <10m above the ground/water. On the 21st January an adult male was observed sitting on plastic-covered peat to the west of VP5. The bird was observed for more than ten minutes before flying off low in a south-easterly direction.

4.1.1.3.1 Summary of peregrine observations

In summary there were two observations of peregrine over the winter 2015/16 survey period. These occurred at VP7 in November and VP5 in January. On both occasions males were observed sitting on peat mounds for relatively extended periods (seventeen minutes in the case of the observation at VP5). When birds were observed in flight they flew at <10 metres in height above the ground. Overall the total flight time for both observations was approximately 840 seconds. There follows a breakdown of the duration of all peregrine observations as a percentage of the total survey time.

Table 5: Duration of peregrine observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	1,170	0.05
Height <10m	840	0.04
Height 10-100m	0	0
Height >100m	0	0
Total	2,010	0.09

4.1.1.4 Kestrel

Kestrel has a widespread breeding distribution in Ireland typically nesting in trees or cliffs. They typically hunt small mammals although invertebrates and small birds may also be taken. They have a characteristic hunting style, being capable of hovering in mid-air for short periods while they scan the ground below for signs of prey. They typically hunt over open ground including farmland, moorland, wetlands and coastal areas. They may also frequent more built-up areas, often seen hunting along roadside verges. Kestrel is amber-listed in Ireland due to a continuing, moderate decline in the European population⁸. In total, forty-seven individual observations of kestrels were made over the course of the winter 2015/16 survey with kestrels often observed numerous times during the one VP watch. There follows a summary of some of these observations. A more detailed summary of all observations is given in Appendix 2.

On the 10th September, during VP14, an adult female was observed hovering over a patch of gorse, north of the VP, at an approximate height of 30m. This bird was observed for 70 seconds before disappearing out of view. On the 15th September an adult female was observed from VP15 perched on a peat mound preening and looking for prey. This bird remained sitting for 260 seconds before flying west into an area of scrub where it disappeared from view. On the 16th September a female was observed flying low over the bog along a peat mound east of VP11. This bird flew <10m above the ground before moving behind the mound.

On the 12th October, during VP4, an adult male was observed hunting over cutover bog and deciduous woodland for approximately 35 seconds. Also on the same day at VP5 an adult male was seen hunting over farmland at a height of 25 metre above the ground. On the 13th October an adult male was observed from VP13 perched on a telegraph pole. The bird flew west over the bog and into

⁸ <http://birdwatchireland.ie/IrelandsBirds/Raptors/Kestrel/tabid/397/Default.aspx> [Accessed 14/03/2016]

an area of scrub where it was lost from view. On the 14th October during VP4 a kestrel was observed hunting over cutover bog and willow scrub. On the following day a female was observed from VP10 perched on a peat mound preening. This bird was observed for 240 seconds before moving out of view. On the 19th October a female was observed from VP9 perched on a peat mound for 720 seconds before moving out of view. On the 22nd October a female was observed from VP7 flying in a north-westerly direction approximately 3 metres above the bog. On the following day, during VP6, a female was observed hovering above an area of gorse, approximately 50-60m above the ground. The bird moved off in a westerly direction before dropping out of view into the gorse. On the 28th October an immature female flew into the site from the west at <10m height, during VP15. This bird hovered looking for prey, before dropping to the ground. Following this it took flight again and flew east, between 2-3m above the ground, towards farmland to the east of the site. Also on this day an adult male was observed from VP14. This bird flew in from farmland to the south-east of the site, hovering over an area of bare peat near the train line crossing. It then flew north hunting over rough ground at the edge of the bog before flying towards farmland to the east of the site.

On the 4th November, during VP8, a male was observed flying along a hedgerow at the boundary between farmland and bog. The bird flew approximately 2m above the ground, before moving off to the south. On the 11th November an adult female was observed flying along a hedgerow, again at a boundary between farmland and bog. The bird flew south from VP6 at a height of between 8-10m, drifting out of view over the hedgerow and tree-line. On the 18th November an adult male was observed from VP10 flying over the south of the site in a westerly direction. The bird hunted at an approximate height of 2-3m above the ground. On several occasions the bird was grounded by high winds before eventually flying off west towards a tree-line. On the 24th November a bird was seen hovering to the north of the site, near VP5, at a boundary between cutaway bog and spruce plantation. The bird hovered at 12-15m height before disappearing over the spruce plantation.

On the 4th December an adult female was observed hovering over bog south-west of VP10. The bird was observed for 40 seconds before dropping out of view behind a peat mound. On the 16th December a female was observed hunting from VP1. The bird hovered high over the bog before heading north. On the 6th January an immature female was observed from VP15. This bird hunted over farmland to the west of the VP, traversing the bog in a north-south pattern, at <10m height, before eventually moving off west. On the 20th January a kestrel was observed from VP4 hunting in the north-eastern section of the site. The bird was observed flying back and forth over the bog, stopping to hover on several occasions, before flying off in an easterly direction. On the 26th January, during VP1, a kestrel was observed chasing a hen harrier along a tree line at the edge of the bog. The kestrel gave up after a time and dropped out of view.

On the 2nd February, during VP14, a pair flew southwards along the eastern edge of the site, calling to and harassing each other. The bird flew at approximately 6-8m height, moving south quickly. On the 10th March, during VP7, an adult bird was observed hunting over woodland in the far northwest of the site. The bird alternated between perching on a tree and heading out over the bog to hunt before being harassed by a raven. The kestrel landed on a peat mound and appeared to pick at insects on the ground before dropping over to the other side of mound and out of view. On the 15th March a female flew from north of the road at VP12. She was observed hunting for 60 seconds along a tree line to the west of the VP location at approximately 4 metres height.

4.1.1.4.1 Summary of kestrel observations

A total of forty-four kestrel observations were made during the winter 2015/16 survey period. The peak count was recorded in October when twelve birds were recorded. The majority of the observations involved birds hunting, mainly over scrub, heath and vegetated cutover bog.

Table 6: Duration of kestrel observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	5,260	0.23
Height <10m	5,424	0.24
Height 10-100m	2,030	0.09
Height >100m	0	0
Total	12,714	0.56

4.1.1.5 Sparrowhawk

Sparrowhawk (*Accipiter nisus*) is a small bird of prey resident throughout Ireland all year round. Their main prey is small birds which are typically taken mid-flight. Sparrowhawks often rely on the element of surprise, typically utilising hedgerows or other forms of cover to catch prey unawares. Their capacity for agile flight allows them to hunt in relatively covered areas such as through woodland. They have a widespread breeding distribution in Ireland although areas with woodland are favoured as they nest in trees. They are known to frequent urban areas such as parks and gardens where sufficient cover exists. In the latest assessment of the conservation status of Ireland's birds sparrowhawk has been downgraded to the amber-list due to short-term declines in abundance (Colhoun & Cummins, 2013). Seventeen separate observations of sparrowhawks were made during the winter 2015/16 survey. There follows a brief summary of some of these observations. Further details on all sparrowhawk observations are given in Appendix 2.

On the 14th October a female was observed from VP12 hovering south-east of the VP location at approximately 100m height. Following this the bird dropped out of sight into a wooded area. On the 29th October a large female was observed from VP15 flying low over a road and along a peat embankment, at less than 10 metres height, before moving off in a south-westerly direction. On the 19th November a female was observed from VP13 flying east over the bog, at a height of 2-3m, before disappearing into a wooded area. On the 24th November an adult female was observed during VP4 flying in a northerly direction, east of the VP. It flew approximately 5m above the ground before going out of view behind a hedgerow.

On the 2nd December an adult male flew low over the bog (1-2m height) from the north of VP7. It flew low across the road in an easterly direction over cutover bog towards farmland and hedgerows. On the 8th December an adult male was observed flying along a road in a northerly direction, from VP13. The bird flew low (0.5m height above the ground) before disappearing behind a hedgerow. On the 14th December a female flew from farmland to the east of VP8 over open bog, hunting at a height of 8m before flying off quickly in a westerly direction. On the 6th January an adult female flew from the east of VP15 towards the west of the site, at an approximate height of 1-2m. On the 14th January a female was observed to the north-west of VP6, hunting while moving in a south-easterly direction. The bird flew low across the bog, at an approximate height of 2m.

On the 2nd February, during VP14, a female flew very quickly across the bog and main road, heading south-east at less than 1m height above the ground. On the 4th February, at VP8, a juvenile male flew onto the site from the south-west. At the south-eastern corner of the site the bird was harassed by hooded crows. On the 16th February, during VP6, a female was observed hunting low over the bog adjacent to the railway line. The bird flew quickly low to the ground, at less than 1m height, heading from west to east. On the 11th March, a large female was observed flying over VP15 having come from the west. The bird passed overhead at a height of 4-5 metres. On the 15th March, during VP8, a large female was observed hunting over farmland to the south-west of the VP for approximately 60 seconds, while being harassed by hooded crows. The bird flew at between 4-5 metres before being chased off in a westerly direction.

4.1.1.5.1 Summary of sparrowhawk observations

A total of seventeen separate observations of sparrowhawks were made while conducting the winter 2015/16 bird surveys. The peak count for this species was recorded in February when a total of four sparrowhawks were recorded. Observations were typically of birds hunting or commuting. The vast majority of sightings were of birds flying at less than 10 metres height, often only 1-2 metres above the ground, which is typical flight behaviour for this species when hunting small passerines. There were no observations of sparrowhawks flying at between 10-100 metres height and a single observation at greater than 100 metres when a sparrowhawk was observed hovering during VP12. The majority of sightings occurred from VP8 and VP15 with three observations made from each VP. Mobbing of sparrowhawks by hooded crows was recorded on two separate occasions, both at VP8.

Table 7: Duration of sparrowhawk observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	0	0
Height <10m	655	0.03
Height 10-100m	130	0.01

Flight category	Time (sec)	Percentage (%)
Height >100m	0	0
Total	785	0.04

4.1.1.6 Buzzard

Buzzards are a medium-sized bird of prey which is found predominantly in the east and north of the country. The majority of the Irish population are resident although numbers are boosted by birds from Britain during the winter season. Buzzards require large, open expanses of land in which to hunt and take a wide variety of prey including small mammals, birds, amphibians and invertebrates. They typically nest in trees or on cliffs. Buzzard is green-listed in Ireland and the European population is considered to be secure⁹. In total sixty separate observations of buzzard were made during the winter 2015/16 survey period, although seventeen of these sightings pertained to birds observed outside the site boundary. Buzzard was therefore the most frequently observed bird of prey during the survey period. Like kestrel, buzzards were often observed on several occasions throughout individual VP watches. A brief summary of some of these observations is given in the following paragraphs. Further details on these and all other observations are given in Appendix 2.

On the 10th September two adults were observed from VP14 flying from the west of the site in an easterly direction. They flew over bog and woodland at an approximate height of 50m before going out of view behind a tree-line. On the 15th September three adults were observed from VP14 soaring over the bog at a height of 150m. They moved south before soaring in an easterly direction over woodland then disappeared behind a tree-line. On the 16th September three adults were again observed, this time from VP13. These birds were observed outside the site boundary, soaring at a height of approximately 200m before disappearing from view. On the 6th October three adults were observed south of VP14 soaring at a height in excess of 200m. On the same day three adults, presumably the same birds, were again seen from VP14, soaring east over woodland. Birds were observed for 120 seconds at a height in excess of 100m. On the 9th October one bird was observed flying in a westerly direction north of VP14. This bird flew at an approximate height of 80m before disappearing behind a tree-line. On the 16th October an adult was observed flying in a southerly direction, north-west of VP11. This bird flew over woodland at an approximate height of 200m, continuing in a southerly direction before moving out of view.

On the 6th January a juvenile was observed sitting on the ground in an improved field to the east of VP14, outside the site boundary. On the following day an adult was observed from VP15 hunting above the tree-line to the south-east of the site. This bird flew at a height of 3-4m above the ground. On the 14th January an adult was observed perched on a pole in an area of conifer near VP6. The bird remained here for 30 minutes during a snow shower before flying low (3-5m height) over the bog towards farmland in the north-west, again landing on a pole. Approximately 30 minutes later the same bird flew back across the site in an east-south-easterly direction, approximately 8m above the

⁹ <http://birdwatchireland.ie/IrelandsBirds/Raptors/Buzzard/tabid/396/Default.aspx> [Accessed 14/01/2016]

ground. On the 3rd February, during VP14, a buzzard was observed soaring at between 30-40m for approximately 3 minutes in the south-eastern corner of the site where bog meets farmland. The bird was heard calling continuously as it drifted eastwards. On the 11th February during VP5 an adult was observed perched on power line pole east of the VP location. The bird flew north-eastwards approximately 20 metres above the ground. The same bird was observed again on another pole southeast of the VP where it remained for more than an hour before flying off in unknown direction. On the 18th February, during VP9, a buzzard was observed circling over open bog, at between 20-25 metres above the ground. The bird drifted off to the southern section of the site after approximately 60 seconds of soaring, followed closely by a kestrel.

On the 10th March, a buzzard was observed soaring in circles to the north-west of VP6 at between 10-12 metres before drifting out of sight towards the northern section of the bog. Presumably the same bird re-appeared some time later perched on top of a tall conifer in the north-eastern corner of the site. The bird remained in-situ for several minutes before flying off to the east. On the 14th March there were three separate observations of buzzards from VP11. A buzzard was harassed by hooded crows as it flew low over the bog heading in a south-easterly direction. Sometime later two birds were observed soaring on two different occasions north-east of the VP at between 10-100 metres height. Also on the same day seven separate observations of buzzards were made at VP13. Sightings varied between two and three birds however all were observed to the south-east of the VP location. Probable courtship displays by a pair were observed. Two buzzards were also observed on multiple occasions in the same location on the 18th March during VP13.

4.1.1.6.1 Summary of buzzard observations

There were a total of forty-three on-site observations of buzzard during winter 2015/16 vantage point surveys. The peak count for this species was recorded in March with twenty-eight birds recorded. Buzzards were most frequently recorded at VP13, VP11 and VP14. Overall, the number of birds per sighting ranged from single individuals up to six birds, observed during VP13 in September. In general observations were of birds hunting, soaring and commuting although displaying behaviour was recorded on three separate occasions at VP3, VP13 and VP15, all during the month of March. There were also several observations of buzzards being mobbed/harassed by other species, namely swallow, hooded crow, rook, raven and jackdaw.

Table 8: Duration of buzzard observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	20,040	0.88
Height <10m	403	0.02
Height 10-100m	6,142	0.27
Height >100m	4,000	0.18

Flight category	Time (sec)	Percentage (%)
Total	30,585	1.35

4.1.2 Wildfowl/Wader/Gull and Other Wetland Species Vantage Point Observations

A total of thirteen species of wildfowl, wader, gull and other wetland bird species were recorded throughout the winter 2015/16 vantage point surveys. Tabulated summaries of all species observations are located in Appendix 2 and flight paths can be found in Appendix 3. There follows a brief summary of observations of each species including breakdowns of observation durations as a percentage of total survey time.

4.1.2.1 Barnacle Goose

Barnacle goose (*Branta leucopsis*) is a winter visitor to Ireland, returning between October and April, from its breeding grounds in Greenland¹⁰. During the winter months they can be seen in coastal grassland where they forage on grass and other plants as well as in estuaries and salt marsh. Barnacle goose is amber-listed in Ireland due to a highly localised over-wintering population which is important in an international context (Colhoun & Cummins, 2013). They are also listed on Annex I of the EU Birds Directive¹¹.

There was a single observation of barnacle goose throughout the entire winter 2015/16 survey period. On the 14th December a flock of thirteen barnacle geese were observed as they flew up the River Shannon, near to Lanesborough town, south of VP3 and outside the site boundary. This was a very good inland record for this species. Although there are historical records of barnacle geese from Turren Turlough (1996-2001)¹², located approximately 1km from the site boundary due west of VP10, none have been recorded during the four I-WeBS counts which have been carried out at the site between the 2004/05 and the 2012/13 winter seasons (BWI, 2016). Similarly, a single historical record exists from Lough Iron, which is located c.24km from the site boundary and is designated as a SPA (Site code: 004064), from the winter of 2006/07 when one individual was recorded during that season's I-WeBS count (BWI, 2016a). The closest known wintering populations of barnacle geese to the site are located at Lissadell in Co. Sligo and Belmullet in Co. Mayo. Given the absence of any records for this species in the area in recent years and the unusual nature of this sighting given its inland nature it is considered probable that the flock observed in mid-December was displaced, most likely due to adverse weather conditions rather than representing a local wintering population.

4.1.2.2 Greenland White-fronted Goose

Greenland white-fronted goose (*Anser albifrons flavirostris*) is a scarce winter visitor to Ireland, between October and April. They can be found in a variety of habitats including peatlands, coastal dunes/grassland, saltmarsh and agricultural grassland where they graze on vegetation and other

¹⁰ <http://birdwatchireland.ie/Default.aspx?tabid=156> [Accessed 14/03/2016]

¹¹ http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/b/branta_leucopsis_en.htm [Accessed 14/01/2016]

¹² <http://maps.biodiversityireland.ie/#/Map> [Accessed 16/06/2016]

plant matter. However, the distribution of the wintering population is highly-localised and for this reason the species is amber-listed in Ireland¹³. It is also an Annex I species.

There was one observation of Greenland white-fronted goose between September 2015 and March 2016. On the 11th November three birds were observed during VP7 feeding in drains and a wet area of bog just in front of the VP. The geese fed in this area along with mallards for the duration of the VP. A map showing the location of these birds can be found in Appendix 3.

Greenland white-fronted goose is regularly recorded during winter months along the River Suck (BWI, 2016a), located approximately 20km to the west and south-west of Lanesborough and the species is a qualifying interest species for the River Suck Callows SPA (004097). It is also a qualifying interest species for Lough Croan Turlough SPA (004139) which is situated in excess of 20km to the south-west of the site boundary. Greenland white-fronted goose is not a qualifying interest species for Lough Ree SPA (004064) however has been recorded present once during the five I-WeBS (Irish Wetland Bird Survey) counts carried out at the site between the winters of 2004/05 and 2010/11 (BWI, 2016b). The three birds observed in Derryadd Bog in November 2015 may possibly have represented a breakaway group from one of these SPA sites or indeed may have been en-route to these wetland areas.

Table 9. Duration of Greenland white-fronted goose observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	10,800	0.48
Height <10m	0	0
Height 10-100m	0	0
Height >100m	0	0
Total	10,800	0.48

4.1.2.3 Greylag Goose

Greylag goose (*Anser anser*) is mainly a winter visitor between November and April although small numbers breed in Ireland in isolated pockets close to lakes and other water-bodies. The over-

¹³ <http://birdwatchireland.ie/Default.aspx?tabid=153> [Accessed 14/03/2016]

wintering population graze on arable agricultural land, particularly in the east and north of the country. Due to a highly-localised wintering population the species is amber-listed in Ireland¹⁴.

There was one observation of this species during the winter 2015/16 survey period. On the 19th January one bird was observed feeding amongst whooper swan and mallard in a waterlogged area of bog to the north of VP6. The bird was observed throughout the duration of the VP. A map showing the location of this bird is given in Appendix 3.

Table 10. Duration of greylag goose observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	10,800	0.48
Height <10m	0	0
Height 10-100m	0	0
Height >100m	0	0
Total	10,800	0.48

4.1.2.4 Mute Swan

Mute swan (*Cygnus olor*) is widespread throughout Ireland all year round breeding on lakes, ponds and rivers. They feed mainly on aquatic plants although they may occasionally be seen grazing on land. Mute swan is amber-listed in Ireland due to the importance of both the breeding and over-wintering populations in an international context (Colhoun & Cummins, 2013).

There were three observations of mute swan during the survey period. On the 14th December four mute swans were observed feeding in a flooded field, in amongst whooper swan, teal and lapwing, just north of VP3, near the road leading to VP1 and VP2. On the 26th January two mute swans were seen feeding at the edge of flooded pool on the bog, in amongst whooper swan, to the north-east of VP1. Finally on the 29th March two birds were observed feeding in a pond in the middle of the bog during VP5. Observations are shown on a map of the area which can be found in Appendix 3.

¹⁴ <http://birdwatchireland.ie/Default.aspx?tabid=154> [Accessed 14/03/2016]

Table 11. Duration of mute swan observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	21,600	0.95
Height <10m	0	0
Height 10-100m	0	0
Height >100m	0	0
Total	21,600	0.95

4.1.2.5 Whooper Swan

Whooper swan (*Cygnus Cygnus*) is a large species of swan which over-winters in Ireland, typically between the months of October and March. They have a relatively wide distribution in winter, occurring mainly in the mid-lands and mid-west of Ireland. During the winter season they can be seen in estuaries and other wetland habitats as well as lowland agricultural areas where they feed on a variety of aquatic plants, as well as occasionally foraging on grass and spilt grain. Whooper swan is amber-listed in Ireland due to a highly restricted, national breeding population and a localised wintering population (Colhoun & Cummins, 2013). The wintering population is internationally important given that Ireland holds more than 20% of the European wintering population¹⁵. The species is also listed on Annex I of the Birds Directive¹⁶. Whooper swan is a qualifying interest species for Lough Ree SPA (004064), situated approximately 330m to the south of Derraghan Bog, at its closest point and 540m south-west of the study area (Lanesborough).

Whooper swans were commonly recorded on the site during the winter 2015/16 survey period. In total there were twenty-two separate observations with a mean of thirty-nine individuals recorded per month. There follows a brief summary of some of the observations for this species. Additional information can be found in Appendix 2 and all observations are shown on a map in Appendix 3.

On the 14th October three adults flew in from the southeast, at approx. 20m height, and landed in an area of cutover bog to the north-west of VP2. On the 29th October four adults were observed from VP14 flying from the west of the site in a south-easterly direction. They flew at a consistent height of 15m above the ground and were observed for a total time of 120 seconds. On the 20th November

¹⁵ <http://birdwatchireland.ie/IrelandsBirds/Swans/WhooperSwan/tabid/151/Default.aspx> [Accessed 14/01/2016]

¹⁶ http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/c/cygnus_cygnus_en.htm [Accessed 14/01/2016]

one bird was observed north of VP11 flying in a south-westerly direction at an approximate height of 30m. On the 2nd December two birds were recorded feeding in a flooded area just north of VP7. These birds remained in-situ for the duration of the vantage point survey. On the following day two birds were again observed feeding in the same flooded area, for the duration of the VP, although water levels were noted to have dropped dramatically overnight. On the 14th December a flock of eighty-six whooper swans were observed just north of VP3, in a flooded field, close to the road leading towards VP 1&2. This flock was mixed with other wildfowl and wader species such as teal, mute swan and lapwing. On the 15th December twenty-two birds were observed feeding in a flooded area of bog, due west of VP2. The flock remained for much of the duration of the VP watch.

On the 14th January a family group, comprising two adults and four juveniles, were observed from VP6. The group flew from the east of the site, across the bog, heading in a westerly direction towards the River Shannon, at an approximate height of 6-10m. The group doubled-back, landing in a flooded area to the north-west of the VP, remaining there for the remainder of the survey. On the 19th January seventy-two birds were observed from VP6 in the northern part of the site. Some were feeding in water-logged areas while others sat on nearby peat mounds roosting and preening. The flock remained throughout the duration of the VP. On the 20th January, during VP4, two whooper swans were observed flying from west to east over open, cutaway bog, at the northern end of the site, close to VP5. Also on this date, during VP5, two birds were seen to fly into the site from the south, landing out of sight in a flooded area of cutover bog. On the 21st January two birds were observed flying from the western side of the site, heading in a south-easterly direction. Another five, comprising two adults and three juveniles, remained in a flooded area of bog, in front of VP5, for the duration of the VP. Also on this date a flock of sixteen whooper swans were seen at VP6. On the 26th January, during VP1, a flock of twenty-six adults were observed sitting roosting on the edge of a flooded area of bog for the duration of the VP watch.

On the 9th February, during VP6, a flock of 148 whooper swans were observed in fields outside the site boundary and to the east of the VP location. On the 11th February, during VP5, 30-40 whooper swans were observed flying north, outside the site boundary and to the north-east of the VP. On the 16th February, during VP6, forty whooper swans spent the duration of the watch feeding in an area of flash floods on cutaway bog in the north of the site. On the 24th February, during VP1, eight birds were observed roosting on the bog. This group was joined by another twelve birds over the course of the VP watch. All birds arrived having left an area of standing water to the north-west of the VP. On the 23rd March, during VP5, eight birds were observed flying northwards having been flushed from a large pool in the bog. They flew between 2-3 metres above the ground landing further up the bog where they remained for the duration of the watch. On the 29th March five whooper swans were observed feeding in a pond in the middle of the bog to the north-east of VP5.

4.1.2.5.1 Summary of whooper swan observations

During the winter 2015/16 vantage point surveys there were a total of twenty-two separate observations of whooper swans; three of these observations were from outside the site boundary. Whooper swans were recorded in every survey month except September and were most frequently recorded at VP5, VP1 and VP6. This species was mainly observed either commuting between locations or feeding in flooded areas of bog. The peak total monthly count within the site boundary was recorded in January when a total of 144 individuals were recorded. The largest group observed together on-site was also recorded in January when a flock of seventy-two birds were seen during

VP6. Overall group sizes observed on-site ranged from 1-144 individuals with many groups containing juveniles, although a flock of 148 was recorded in February outside of the site.

Table 12: Duration of whooper swan observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	123,480	5.44
Height <10m	560	0.02
Height 10-100m	445	0.02
Height >100m	0	0
Total	124,485	5.49

4.1.2.6 Mallard

Mallard (*Anas platyrhynchos*) are a common and widespread resident species in Ireland, with numbers boosted by wintering birds. They can be found in all wetland habitats, nesting where adequate vegetation cover is present and are green-listed in Ireland. There follows a brief summary of some of the observations of this species during the winter 2015/16 surveys.

On the 29th October two drake mallards flew out of a drain just to the north of VP14 and adjacent to the road. They flew to the north-west before veering eastwards and dropping back down into the drain and out of view. On the 11th November fourteen birds were observed from VP7 feeding in drains and a wet area of bog just to the north-northeast of the VP. On the 19th November two were observed feeding in an area of standing water to the north-east of VP13. On the following day four birds were again observed from VP13 feeding in the same area. On the 15th December a flock of thirty mallards were observed feeding in a flooded area of bog due west of VP2. On the following day two drakes and one hen were observed to the north-west of VP1 flying in a north-easterly direction over a flooded area of bog. They were observed for two minutes after which they dropped down onto the bog behind a treeline to the north of the VP. On the 19th January four mallards were observed feeding in waterlogged areas to the north of VP6. On the 21st January two mallards were disturbed from a drain during VP5. The birds landed to the west of the VP in a wet area of bog.

On the 10th March a pair of mallards was observed during VP6. They flew in low over the main road from the south-west, along the rail tracks before turning northwards and dropping onto the bog. Also on this date, three mallards were observed during VP7, commuting across the south-western

corner of the site, approximately 120m above the ground. On the 29th March three birds were observed feeding in a pond in the middle of the bog during VP5.

4.1.2.6.1 Summary of Mallard Observations

During the winter 2015/16 vantage point surveys there were a total of twenty observations of mallard. The species was recorded in every survey month except September and February. Flock size ranged from single birds to thirty individuals recorded at VP2 in December. The majority of observations were from VP1 and VP2.

Table 13. Duration of mallard observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	65,220	2.88
Height <10m	350	0.02
Height 10-100m	215	0.01
Height >100m	70	0.00
Total	65,855	2.91

4.1.2.7 Teal

Teal (*Anas crecca*) are both a resident and migratory species in Ireland. They can be found in estuaries, marshes and other wetland habitats. Teal typically breed near freshwater water-bodies in inland areas. They can occur near the coast during the winter months¹⁷. Teal are omnivorous, feeding on plant matter, seeds and invertebrates and prefer to forage in areas of shallow water. Teal is amber-listed in Ireland due to moderate, long-term declines in the breeding population (Colhoun & Cummins, 2013). There follows a brief overview of the on-site observations for this species.

On the 16th December twenty-five teal were observed from VP2 feeding in a flooded area to the west of the VP location. On the 26th January a group of six birds were observed sitting on the bog roosting at the edge of a bog pool to the north of VP2.

4.1.2.7.1 Summary of Teal Observations

There were two observations of teal on-site throughout the winter 2015/16 survey period. These occurred in the months of December and January, both at VP2 when in both cases birds were

¹⁷ <http://birdwatchireland.ie/Default.aspx?tabid=161> [Accessed 14/03/2016]

observed on the ground for the duration of the VP watches. Additionally, there were observations of teal at VP1 and VP3 in December; however these birds were observed outside the site boundary.

Table 14. Duration of teal observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	21,600	0.95
Height <10m	0	0
Height 10-100m	0	0
Height >100m	0	0
Total	21,600	0.95

4.1.2.8 Curlew

In Ireland curlew (*Numenius arquata*) occur predominantly as winter visitors to both inland and coastal wetlands around the country with some small breeding populations occurring on bogs and floodplains. They feed on a range of invertebrates with the group often dispersed over a large area, particularly when feeding in estuaries. They tend to roost communally, typically in nearby salt-marsh. The species is red-listed in Ireland due to long-term declines in both the breeding and non-breeding populations, as well as a large decline in the breeding range (Calhoun and Cummins, 2013).

There was only a single record of curlew throughout the seven-month winter survey period. This occurred on the 13th October when a curlew was heard calling to the south-east of VP12. However, dense fog at the time prevented the surveyor from making a visual sighting.

4.1.2.9 Golden Plover

Golden plover (*Pluvialis apricaria*) both breeds and over-winters in Ireland. The main bulk of the Irish population occurs between October and February¹⁸. They have a widespread distribution being found in both coastal and inland areas. During winter months they tend to forage mainly on agricultural land, feeding on soil and surface-dwelling invertebrates and plant matter, although they may also utilise inter-tidal areas for both feeding and roosting. Golden plover is red-listed in Ireland due to declines in both the breeding and non-breeding populations and is also listed as an Annex I species (Calhoun & Cummins, 2013). There follows a brief overview of some of the golden plover observations. More detailed information can be found in Appendix 2 and a map showing all flight paths and areas of use can be found in Appendix 3.

¹⁸ www.birdwatchireland.ie [Accessed 03/02/2016]

On the 6th October four birds were observed during VP15. Three of these birds were observed south-west of the VP, outside of the site boundary, while one was situated north-west of the VP within the site. On the 22nd October a flock of twenty-one golden plover was observed sitting on the bog just to the north-west of VP7. The flock was observed for a total of 6,420 seconds. On the 29th October four birds were observed, again sitting on the bog, to the north of VP15. They remained at this location for 7,200 seconds before disappearing from view. Also on this date three birds were observed feeding on open bog south-west of VP14, for the duration of the survey. On the 11th November two birds were observed from VP7 feeding on bare peat in the south of the site.

On the 2nd December an individual bird flew into the site from the south-east. It landed and began feeding at the edge of a flooded area in the middle of the site, to the south of VP12. It remained in view until weather conditions deteriorated. On the 3rd December a single bird was observed feeding in a waterlogged area directly north of VP7. This individual was observed for the duration of the VP watch. On the 7th December, during VP4, a flock of sixty-three golden plover was observed flying south. A smaller flock, comprising ten birds, was observed two hours later circling over cutover bog to the north-west of the VP.

On the 6th January a flock of approximately 135 birds was observed from VP14 flying in a V-shape formation, at 300-400m altitude, to the north-west of the site. The flock headed in a south-westerly direction towards Lough Ree. This flock was at least 4-5km from the site, close to Lanesborough town. On the 8th January two birds were observed feeding on a peat mound in the middle of the bog, directly east of VP12. On the 22nd January a flock of eleven golden plover was observed from VP10, flying from south-east to north-west over open bog and farmland. The same flock were observed again, later during the VP watch, sitting in the middle of the bog, to the south-east of the VP, where they remained for the duration of the survey. On the 25th March, during VP10, a flock of twenty golden plover were observed sitting on the bog. The birds remained in-situ for the duration of the VP watch. On the 30th March a large flock, comprising some 500 birds, was recorded at VP1. The flock flew onto the site from a south-westerly direction, landing on the edge of a large flooded area to the north-east of the VP. A map showing all golden plover flight paths and areas of use within the site, recorded during the winter survey period, is given in Appendix 3.

4.1.2.9.1 Summary of golden plover observations

Golden plover were commonly recorded during the winter 2015/16 survey period being recorded in every month except September and February. A total of twenty-five observations of golden plover were made during winter 2015/16 surveys although eight of these were of birds outside the site boundary. The peak count was recorded in March when a total of 535 birds were recorded. The average monthly count over the seven-month period was 119 birds. Observations were mainly of birds feeding/roosting near flooded areas of bog or commuting. The largest flock recorded comprised approximately 500 birds which were observed both within and outside the site boundary over a two day period at the end of March 2016. Golden plover were most frequently recorded from VP1, VP3 and VP7 with VP10 also having several records of this species.

Table 15: Duration of golden plover observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	99,505	4.39
Height <10m	73	0.00
Height 10-100m	455	0.02
Height >100m	4,150	0.18
Total	104,183	4.59

4.1.2.10 Lapwing

Lapwing (*Vanellus vanellus*) occurs as a resident species in Ireland with the country also supporting both winter and summer visitors from mainland Europe. Wintering flocks are regularly recorded on wetlands, pasture and rough land on peatland margins. The species is red-listed in Ireland due to large declines in both breeding and non-breeding populations (Calhoun and Cummins, 2013). There were four records of lapwing throughout the winter 2015/16 survey period. There follows a brief summary of these observations. Further details and a map showing lapwing activity can be found in Appendix 2 and Appendix 3.

On the 28th October, during VP15, a flock of thirty-four lapwings were observed approximately 2km west of the site boundary. The flock was observed circling for approximately 300 seconds before disappearing from view. On the following day thirteen birds flew through the site from the north at a height of approximately 20m above ground during VP14. They flew over open bog heading towards the south of the site. On the 3rd December eleven lapwings were observed feeding in a wet area just north of VP7. These birds were observed for the duration of the VP watch. On the 14th December a flock of fifty-three lapwings were observed feeding in a flooded area just north of VP3, close to the road leading to VP 1 and VP2. These birds were in a mixed group comprising whooper swan, mute swan and teal.

4.1.2.10.1 Summary of Lapwing Observations

Lapwings were recorded on four separate occasions throughout the winter period with two observations in October and two in December. Two of these sightings related to birds seen outside the site boundary. Of the records for lapwing within the site boundary one related to birds commuting through the site while the other was of birds feeding in a flooded area of bog. The peak count for this species was thirteen with a mean monthly count of three. Lapwings were recorded at VP3, VP7, VP14 and VP15.

Table 16. Duration of lapwing observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	10,800	0.48
Height <10m	120	0.00
Height 10-100m	0	0.00
Height >100m	300	0.01
Total	11,220	0.49

4.1.2.11 Snipe

Snipe (*Gallinago gallinago*) both breeds and over-winters in Ireland, with a widespread distribution. Although a relatively common wader its presence is not always immediately obvious as its plumage affords camouflage in the wetland and moorland habitats in which it's found. It is a ground-nesting species favouring damp areas. Its diet comprises mainly plant material and invertebrates (BWI, 2015). Snipe is amber-listed in Ireland due to moderate declines in the European breeding population in recent times (Colhoun & Cummins, 2013). There were sixteen records of snipe throughout the winter 2015/16 survey period. Snipe were recorded in every survey month except September. There follows an overview of some of these observations. Further details and flight paths can be found in Appendix 2 and Appendix 3.

On the 13th October a snipe was disturbed near VP13. The bird flew south over gorse scrub at less than 10 metres height before disappearing from view. On the following day one bird was observed from VP3. On the 16th October a snipe was disturbed by the road-side during VP10. This individual flew in a north-westerly direction, at 3 metres height for approximately 70 metres before going out of view. On the 29th October two birds were observed from VP14 sitting tight on the bog throughout the duration of the VP survey.

On the 12th November a snipe flew in over VP6 from the south of the site at a height of 4 metres. The bird dropped down out of sight into a stand of rush in an area of re-colonising cutaway peat. On the 17th November a snipe was flushed from a drain adjacent to the road near VP10 as a result of tractor activity. It flew at a height of 2-3 metres before dropping back down onto the bog on the northern side of the road. On the following day six birds were flushed from an area of high-quality bog to the north of the road near VP10. The birds flew in a north-north-easterly direction, at a height of 1-2 metres above the bog, before going out of view. On the 4th December two adults were observed flying west from VP10 over gorse scrub at a height of 1 metre above the ground. These

birds were observed for 3 seconds. On the 7th December one individual was flushed by the surveyor on the way to VP11. The bird flew from the edge of the bog, just south of the VP, in a southerly direction over grassland before disappearing behind a hedgerow. On the 15th December one bird was observed feeding on standing water due west of VP2. This bird was observed for the duration of the VP survey. On the 7th January a snipe was flushed from the roadside near VP15. It flew off in a south-easterly direction at a height of 1-3 metres above ground before it was lost from view. On the 19th January two snipe were observed from VP6 feeding in a wet area of bog in the south-east corner of the site.

On the 25th February, during VP10, a snipe was flushed from the north-eastern end of the site. The bird flew in a north-westerly direction, at an approximate height of 2 metres over heather, before going out of view a short time later. On the 18th March two snipe were flushed by a field-worker from grassy vegetation at the edge of the bog, during VP11. The birds flew to improved grassland to the east of the site.

4.1.2.11.1 Summary of Snipe Observations

The peak count for snipe was recorded in November when sixteen birds were recorded. The mean monthly count was five. Snipe was recorded most frequently at VP10 (six observations) and VP11 (four observations). Snipe were also recorded at VP2, 6, 13, 14 and 15. Observations were mainly of snipe flying off having been flushed although birds feeding and commuting were also observed.

Table 17. Duration of snipe observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	32,400	1.43
Height <10m	218	0.01
Height 10-100m	5	0.00
Height >100m	0	0.00
Total	32,623	1.44

4.1.2.12 Cormorant

Cormorant (*Phalacrocorax carbo*) is typically resident in Ireland all-year round, although a proportion of wintering individuals may also occur. They breed mainly on off-shore islands and rocky coast-lines although there are some inland breeding populations. Cormorants feed on fish, foraging mainly in

shallow waters. The species is amber-listed in Ireland due to a localised breeding population¹⁹. There follows a summary of some of the observations of this species. Further details can be found in Appendix 2 and a map showing flight paths is given in Appendix 3.

On the 26th January a cormorant was observed from VP1 flying in a north-westerly direction approximately 40 metres above the bog. On the 24th February a bird was observed from VP1 flying to the east of the VP, heading in a southerly direction. This bird flew over woodland at 40-50m above ground before going out of view. On the following day an individual was observed due east of VP3, on the eastern edge of the site, flying in a southerly direction over the river. On the 30th March a cormorant was observed north of VP1 flying in a south-easterly direction.

4.1.2.12.1 Summary of Cormorant Observations

In total there were six separate observations of cormorants throughout the winter 2015/16 survey period. Cormorants were only recorded in the months of January, February and March 2016. The peak count was in March when eight birds were recorded with a mean monthly count of one. All observations were of birds commuting through the site. All observations were of birds flying at between 10-100 metres above the ground. Cormorants were recorded from three VPs in total, namely VP1, VP2 and VP3.

Table 18. Duration of cormorant observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	0	0.00
Height <10m	0	0.00
Height 10-100m	230	0.01
Height >100m	0	0.00
Total	230	0.01

4.1.2.13 Grey Heron

Grey heron (*Ardea cinerea*) is widely distributed throughout Ireland all-year round. They are a wetland species which can be found in estuaries, marshes, coastlines as well as along rivers and streams. They take a wide variety of prey including fish, small mammals, amphibians, reptiles and

¹⁹ <http://birdwatchireland.ie/IrelandsBirds/Cormorants/Cormorant/tabid/145/Default.aspx> [Accessed 14/03/2016]

invertebrates. Grey herons nest in large trees where they form breeding colonies. The species is green-listed in Ireland. A brief overview of some of the observations of this species is given in the following paragraphs. Additional details on all observations as well as flight paths recorded for this species can be found in Appendix 2 and Appendix 3.

On the 14th October, during VP2, a grey heron was observed flying from the north-east, over bog and willow/birch woodland. The bird flew in a westerly direction calling continuously. On the following day a bird was observed from VP11, flying in a southerly direction over the bog. The bird flew at a height of approximately ten metres and was in view for 3 seconds before moving behind trees. A grey heron was observed on the 19th January flying over the site, to the south of VP6, heading from west to east. On the 12th February an adult was observed commuting over cutover bog from VP4. The bird flew at a height of approximately fifteen metres in an easterly direction. It was in view for six seconds before moving out of sight behind a tree-line. On the 30th March a grey heron spent the duration of the VP watch feeding in small ponds and drains in front of VP1.

4.1.2.13.1 Summary of Grey Heron Observations

In total there were eight separate observations of this species throughout the winter 2015/16 survey period, two of which were from outside the site boundary. Grey herons were recorded in every survey month except for September and November with a peak count of two recorded in October. The majority of sightings were from VP2 and VP3 with two observations recorded at each vantage point. The majority of records were of birds commuting with one record of a grey heron feeding.

Table 19. Duration of grey heron observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	10,800	0.48
Height <10m	0	0.00
Height 10-100m	350	0.02
Height >100m	0	0.00
Total	11,150	0.50

4.1.2.14 Lesser Black-backed Gull

Lesser black-backed gull (*Larus fuscus*) is a large and widespread species of gull²⁰. It is a summer visitor during the March-September period with winter visitors from Iceland and the Faroe Islands

²⁰ <http://birdwatchireland.ie/IrelandsBirds/GullsTerns/tabid/187/Default.aspx> [accessed 19/10/2015]

also occurring. The majority of breeding occurs along the coast and on off-shore islands with some breeding along cliffs and in dune-systems although inland and urban sites may also be used. They are opportunistic feeders taking a wide variety of prey as well as scavenging on waste. Lesser black-backed gull is amber-listed in Ireland due to declines in the breeding population (Colhoun & Cummins, 2013). Lesser black-backed gulls were observed on several occasions towards the end of the winter 2015/16 survey period. A brief summary of some of these observations follows. Additional details can be found in Appendix 2.

On the 9th March a total of twenty-four lesser black-backed gulls were observed during VP6. These birds passed along the southern edge of the site, generally heading in a north-westerly direction, having come from the east/south-east, in groups of 2-3 over approx. 2.5 hours during the VP watch. Birds flew in excess of 100 metres above the ground with each group observed for approximately 90 seconds before going out of view. On the 25th March four birds were observed from VP10 flying in a westerly direction at approximately 300 metres height. They flew north of the VP location over pasture before going out of view. On the 29th March a flock of twelve were observed from VP4 flying from the north-east to the south-west. The flock appeared to be generally following the route of the main road. On the 30th March four birds were observed commuting over woodland and cutover bog habitats, generally flying in a south-westerly direction.

4.1.2.14.1 Summary of Lesser Black-backed Gull Observations

In total there were nine separate observations of lesser black-backed gull during the winter 2015/16 survey period. All observations occurred in March with a total of seventy-five birds recorded. All observations except for one were within the site boundary and all birds were commuting.

Table 20. Duration of lesser black-backed gull observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	0	0.00
Height <10m	60	0.00
Height 10-100m	60	0.00
Height >100m	940	0.04
Total	1,060	0.05

4.1.2.15 Black-headed Gull

Black-headed gull (*Chroicocephalus ridibundus*) is resident in Ireland throughout the year with winter numbers boosted by wintering individuals arriving from mainland Europe. The species over-winters

and breeds in both coastal and inland locations, nesting in colonies in sand dunes, coastal islands, moorland polls, bogs and on freshwater lake islands. They take a wide variety of food items including fish, worms, molluscs, insects and plant material and are opportunistic feeders, taking advantage of any available food-source including domestic/fishing waste. Black-headed gull is red-listed due to a long term decline in its breeding population and distribution (Colhoun & Cummins, 2013).

There was only a single observation of black-headed gull throughout the entire seven months bird surveys. This occurred on the 29th March when three birds were seen commuting along the River Shannon to the north of VP5. The birds flew from the north-east generally heading in a south-westerly direction at approximately 20 metres height.

Table 21. Duration of black-headed gull observations, per flight category, as a percentage of total survey time

Flight category	Time (sec)	Percentage (%)
Non-flight (perched etc)	0	0.00
Height <10m	0	0.00
Height 10-100m	15	0.00
Height >100m	0	0.00
Total	15	0.00

4.1.3 Other Species of Conservation Interest Observed During Vantage Point Surveys

4.1.3.1 Red-listed Species

4.1.3.1.1 Meadow Pipit

Meadow pipit (*Anthus pratensis*) was at one time a common species in Ireland. Its preferred breeding habitat is rough pasture, scrub and upland areas. It occurs throughout Ireland all year round with numbers boosted during the winter with birds from the European mainland. During the winter it tends to move away from upland breeding areas down into the lowlands²¹. This species has been downgraded from green-listed to red-listed due to a short-term decline in the breeding population (>50%) (Colhoun and Cummins, 2013).

²¹ <http://birdwatchireland.ie/IrelandsBirds/PipitsWagtails/MeadowPipit/tabid/1036/Default.aspx> [Accessed 14/03/2016]

Meadow pipit was recorded during every month of the winter 2015/16 surveys and at all fifteen vantage point locations. The highest counts were recorded in September and March when 179 and 148 birds were recorded respectively. The mean monthly count was 85 birds.

4.1.3.1.2 Woodcock

Woodcock (*Scolopax rusticola*) are resident throughout much of Ireland all year round although some wintering birds also occur. They are a ground-nesting species breeding in wooded areas. They may be found in scrub and moorland during the winter months when their distribution is not as restricted²². Woodcock are red-listed in Ireland due to a long-term decline in the breeding range (Colhoun & Cummins, 2013).

There was only a single record for woodcock during the winter surveys. This occurred on the 20th January, during VP5, when a woodcock was flushed from dense cover to the south of the VP location. The bird flew a short distance (4 metres) at approximately 0.5m above the ground, before dropping back down into deep brush. This was the only observation of this species during the winter 2015/16 bird surveys.

4.1.3.2 Amber-listed Species

Many amber-listed species were recorded on a regular basis during the winter surveys. Species which were recorded in every month included gold crest (*Regulus regulus*), linnet (*Carduelis cannabina*), mistle thrush (*Turdus viscivorus*), robin (*Erithacus rubecula*), starling (*Sturnus vulgaris*) and stonechat (*Saxicola torquatus*). Peak counts were 28, 45, 24, 105, 1,038 and 17 respectively, as outlined in Table 2 (Section 4.1 above).

Other less-frequently recorded amber-listed species included greenfinch (*Carduelis chloris*) and skylark (*Alauda arvensis*). Greenfinch was recorded in every month except January and February with a peak count of thirteen recorded in November while skylark was recorded in every month except December with a peak count of eight recorded in March. House sparrow (*Passer domesticus*) was recorded in January and February only with two birds recorded in each month. Wheatear (*Oenanthe oenanthe*) was observed in September and October with five birds recorded per month.

Four amber-listed species were recorded only once throughout the entire duration of the seven months of surveys, namely house martin (*Delichon urbicum*), kingfisher (*Alcedo atthis*), sand martin (*Riparia riparia*) and swallow (*Hirundo rustica*). House martins are visitors to Ireland between March and September²³. This species was recorded at VP3 on the 12th September. Like house martin, sand martins are a common visitor to Ireland during the summer months. The only record for this species is from the 11th September when four were recorded at VP10. Swallow was also only recorded in September with a total of 660 birds recorded across all fifteen vantage points throughout the month. Kingfisher has a widespread distribution throughout Ireland occurring everywhere except for the extreme western fringes of the country. On the 22nd January, during VP10, a kingfisher was observed in a drain located to the south-west of the VP, just outside the site boundary.

²² <http://birdwatchireland.ie/IrelandsBirds/Waders/Woodcock/tabid/329/Default.aspx> [Accessed 14/03/2016]

²³ <http://birdwatchireland.ie/IrelandsBirds/SwallowMartins/HouseMartin/tabid/1035/Default.aspx> [Accessed 06/05/2016]

4.2 TRANSECT SURVEY RESULTS

Transect surveys were carried out in November 2015 and March 2016. Appendix 1 illustrates the locations of the transect routes and Table 22 below provides details of all birds recorded. Colour-coding follows that used for Table 2 above, as explained in section 4.1.

Table 22. Species transect totals from November 2015 and March 2016

Common Name	Scientific Name	Nov 2015	Mar 2016	Peak Count
Arctic Redpoll	<i>Carduelis hornemanni/exilipes</i>	1	0	1
Blackbird	<i>Turdus merula</i>	46	50	50
Blue tit	<i>Cyanistes caeruleus</i>	14	19	19
Bullfinch	<i>Pyrrhula pyrrhula</i>	6	2	6
Buzzard	<i>Buteo buteo</i>	0	3	3
Chaffinch	<i>Fringilla coelebs</i>	55	49	55
Chiffchaff	<i>Phylloscopus collybita</i>	1	1	1
Coal tit	<i>Periparus ater</i>	14	17	17
Dunnock	<i>Prunella modularis</i>	19	27	27
Fieldfare	<i>Turdus pilaris</i>	87	0	87
Goldcrest	<i>Regulus regulus</i>	7	6	7
Goldfinch	<i>Carduelis carduelis</i>	18	2	18
Great tit	<i>Parus major</i>	2	5	5
Greenfinch	<i>Carduelis chloris</i>	1	2	2
Grey Heron	<i>Ardea cinerea</i>	0	2	2
Hooded crow	<i>Corvus cornix</i>	24	39	39
Jackdaw	<i>Corvus monedula</i>	64	60	64
Kestrel	<i>Falco tinnunculus</i>	1	1	1
Lapwing	<i>Vanellus vanellus</i>	6	0	6
Lesser Black Backed Gull	<i>Larus fuscus</i>	0	4	4
Linnet	<i>Carduelis cannabina</i>	7	0	7
Long tailed tit	<i>Aegithalos caudatus</i>	11	8	11
Magpie	<i>Pica pica</i>	22	15	22
Mallard	<i>Anas platyrhynchos</i>	0	7	7
Meadow pipit	<i>Anthus pratensis</i>	25	61	61
Mistle thrush	<i>Turdus viscivorus</i>	9	10	10
Pheasant	<i>Phasianus colchicus</i>	2	9	9
Pied wagtail	<i>Motacilla alba</i>	4	6	6
Raven	<i>Corvus corax</i>	2	0	2
Redpoll	<i>Carduelis flammea</i>	66	0	66
Redwing	<i>Turdus iliacus</i>	118	0	118
Reed bunting	<i>Emberzia schoenichus</i>	22	15	22
Robin	<i>Erithacus rubecula</i>	45	77	77
Rook	<i>Corvus frugilegus</i>	52	14	52
Siskin	<i>Carduelis spinus</i>	2	0	2
Skylark	<i>Alauda arvensis</i>	0	1	1
Sand Martin	<i>Riparia riparia</i>	0	1	1
Snipe	<i>Gallinago gallinago</i>	6	1	6

Common Name	Scientific Name	Nov 2015	Mar 2016	Peak Count
Song thrush	<i>Turdus philomelos</i>	4	10	10
Starling	<i>Sturnus vulgaris</i>	199	15	199
Stock Dove	<i>Columba oeanas</i>	12	0	12
Stonechat	<i>Saxicola torquatus</i>	4	8	8
Swallow	<i>Hirundo rustica</i>	0	1	1
White-tailed sea eagle*	<i>Haliaeetus albicilla</i>	0	1	1
Whooper Swan*	<i>Cygnus cygnus</i>	7	5	7
Woodpigeon	<i>Columba palumbus</i>	30	40	40
Wren	<i>Troglodytes troglodytes</i>	31	53	53
Total No of Species		39	38	47

Note: Annex 1 species are denoted with an asterisk (*) and highlighted in bold

Summary

Overall, a total of forty-seven species were recorded during the winter (2015/16) transect surveys. The species recorded largely reflected those which were recorded during the vantage point surveys. Thirty-nine species were recorded in November including two red-listed and eleven amber-listed species. Thirty-eight species were recorded during the March transects carried out on-site including two red-listed and thirteen amber-listed species. Brief overviews of these transect observations are provided in the following sections.

4.2.1 Raptor Transect Observations

4.2.1.1 Buzzard

There was a total of three buzzard observations during the winter transect surveys. Two buzzards were recorded during transect 11 on the 14th March. A buzzard was also recorded at transect 6 on the 31st March. This adult was observed soaring at an approximate height of 10-14 metres over cutover bog for 120 seconds. Buzzards are green-listed and the European population is considered secure.

4.2.1.2 Kestrel

The only bird of prey recorded during the November transects was kestrel. This bird was recorded during transect 10 on the 19th November. An adult female was observed hunting at a height of 8-10 metres in an area of cutaway bog that had regenerated. The bird was observed hovering and circling before flying off northwards. There was only a single sighting of kestrel during the March transects. This occurred at transect 10 on the 30th March when a female was observed sitting on a peat mound feeding. A map showing the relevant areas is given in Appendix 3.

4.2.1.3 Additional raptor sighting

Also of note is the record of a white-tailed sea eagle (*Haliaeetus albicilla*) which was observed prior to the commencement of transect 12 on the 29th March while surveyors waited for heavy rain and sleet to clear. This bird, which was wing-tagged, flew up from the bog unexpectedly, quite close to operating machinery, at an approximate height of 7-8 metres, gaining height as it flew in a westerly direction. It was followed closely by a buzzard. Both flew over the road and were lost from view.

4.2.2 Wildfowl/Wader/Gull and other Wetland Species Transect Observations

4.2.2.1 Grey Heron

There were two observations of grey heron both of which occurred in March. An individual was recorded at transect 14 on the 25th March. This adult was observed to the south-east flying along a tree line over pasture at approximately 10 metres height. A grey heron was also observed on the 29th March during transect 3.

4.2.2.2 Lapwing

Six lapwing were recorded during transect 14 on the 24th November. This was the only November transect record for this species. Lapwing were not recorded during the March transects.

4.2.2.3 Lesser Black-backed Gull

There were no sightings of this species during the November transects. A total of four lesser black-backed gulls were recorded during the March transects. On the 29th March one was observed at transect 7 while a further two were recorded at transect 8. On the following day a single individual was observed at transect 10 flying in a west-north-west direction.

4.2.2.4 Mallard

Seven mallards were observed in total during the March transects. Two were seen during transect 1 on the 31st March flying over the bog in a north-easterly direction at a height of 3 metres. Another individual was observed on the same day at transect 2 flying south over the bog at a height of 8-10 metres. Also on this date two mallards were recorded at transect 5. These birds were flushed from the bog after which they flew north-westwards over trees before going out of view. A pair of mallards was also observed on the 30th March during transect 10.

4.2.2.5 Snipe

There were two observations of snipe during the November transects. On the 19th November five snipe were recorded during transect 9. These birds were flushed by the surveyor from the edge of the bog. They flew off quickly, in a westerly direction at less than 1 metre above the ground. Another snipe was recorded on the following day at transect 11. This bird was flushed by the surveyor. It flew in a northerly direction approximately 1 metre above the ground and was in view for a total of three seconds before dropping into cover after approximately 100 metres. There was one observation of snipe from the March transects which occurred on the 25th March during transect 14. An adult bird was flushed from the edge of the bog flying southwards at approximately 1 metre above the ground before going out of view.

4.2.2.6 Whooper Swan

There were two sighting of whooper swan during the November transects. Seven whooper swans were recorded during transect 12 on the 19th November. These birds flew over the site in a south-westerly direction at an approximate height of 10 metres. Also on this date a flock of eighteen birds, comprising nine adults and nine juveniles, were observed in a flooded area of the bog, north-east of VP1 near the railway line. There was a single observation of whooper swan during March. Five birds were recorded on the 31st March during transect 5. This group was observed roosting to the east adjacent to a flooded area of bog as shown in Appendix 3.

4.2.3 Other Species of Conservation Interest Transect Observations

4.2.3.1 Red-listed Species

Meadow pipit was the only other red-listed species recorded during transect surveys. Meadow pipits were commonly recorded along many of the transect routes. A total of twenty-five meadow pipits were recorded during the November transects while sixty-one were recorded in March. The greatest number during any one transect was recorded on the 30th March during transect 9 when a total of fourteen meadow pipits were observed.

4.2.3.2 Amber-listed Species

A total of eleven amber-listed species were recorded during the March and November transects carried out over the winter 2015/16 survey period. Goldcrest, greenfinch, mistle thrush, robin, starling and stonechat were all recorded in both March and November. Linnets and stockdoves were recorded in March only while skylark, sand martin and swallow were only recorded in November. Of all species recorded the most abundant was starling with a total of 199 birds recorded in March. Skylark, sand martin and swallow were recorded least frequently with only single observations made for each species.

5 DISCUSSION

5.1 RAPTORS

Six species of raptor were recorded during the winter 2015/16 surveys, namely hen harrier, kestrel, sparrowhawk, peregrine falcon, buzzard and merlin.

Hen harrier was recorded on six different occasions throughout the seven months of vantage point surveys. Most of the observations occurred from VP1 with hen harrier also recorded at VP2, VP5 and VP12. All observations were of birds hunting with a wide variety of habitats utilised, in particular scrub, rough pasture, woodland and the interface between cutover bog and adjacent habitats. Of note is that hen harriers were also recorded at VP1 and VP12 during the previous year's vantage point surveys. Continuing usage of these areas is most likely a factor of the abundance of suitable foraging habitat occurring in vicinity of these VPs. One of the hen harriers observed from VP1 was wing-tagged. This immature individual was recorded on three separate occasions on the 24th September 2015, 16th December 2015 and 26th January 2016. Following investigation it was determined that the individual was tagged in the Slieve Bloom Mountains in 2014 (Pers. Comm. B. O'Donoghue), located in excess of 60 kilometres to the south of the subject area. This mountain range is designated as a Special Protection Area (SPA) for this species.

Hen harriers were not recorded during any transects carried out on-site and no winter roost sites for this species were identified. Based on the results of the vantage point surveys hen harriers appear to predominantly utilise the north of the site (VP1, VP2 and VP5) although the single observation at VP12 confirms hen harrier activity in the south also. However, despite the abundance of suitable foraging habitat in the general area, overall usage of the site by hen harrier appears minimal.

Sightings of merlin were much more frequent relative to the winter 2014/15 results with thirteen separate observations recorded throughout the 2015/16 vantage point surveys. In general merlin was most frequently recorded at VP1, VP11 and VP15 with the majority of sightings pertaining to

birds hunting, mainly over bog edges, with several records of merlin sitting perched on peat mounds, often for relatively extended periods. When in flight birds were most often seen flying low over the ground as is characteristic of the species when hunting.

There were two sightings of peregrine over the course of the seven months vantage point surveys. These occurred during November and January at VP7 and VP5 respectively. On both occasions adult males were observed sitting on peat mounds hunting mallard. A male was observed for an extended period actively hunting mallard at VP7 and it was noted that the male observed from VP5 had been watching mallard sitting in a nearby drain for some time. Given the quite specialised hunting behaviour observed it is highly likely that this is the same bird. Due to its familiarity with the area around VP5 and VP7 this bird is not likely to be transiting through the area and rather is likely to be breeding in the locality, possibly nesting at the factory building at Lanesborough or potentially in a local quarry. It most likely visits the site occasionally to hunt.

The number of observations of sparrowhawks was much greater relative to the previous year's surveys with a total of seventeen separate observations during the winter 2015/16 period. Sparrowhawk was recorded in every month except September with the majority of records occurring in the south. Sightings were generally of birds hunting low over ground as is characteristic of the species.

Kestrel was recorded on a regular basis throughout the winter 2015/16 survey period. This bird of prey is largely a resident within its breeding territory. Kestrel was recorded in each of the seven months with a mean monthly count of six. The vast majority of kestrel sightings were of birds hunting and a wide variety of habitat types were utilised including scrub, cutover bog and farmland. Kestrels were recorded at each of the fifteen VP locations suggesting a healthy population within the study area and adjoining lands. In particular kestrel hunting patterns at VP4 were noted to be very similar to that of kestrels observed at the same location during the winter 2014/15 surveys.

In total sixty separate observations of buzzard were made during the winter 2015/16 survey period, although seventeen of these sightings pertained to birds observed outside the site boundary. Buzzard was therefore the most frequently observed bird of prey during the survey period. Like kestrel, buzzards were often observed on several occasions throughout individual VP watches. Buzzards were observed throughout the study area and there is ample foraging/breeding habitat for this species. In general observations were of birds hunting, soaring and commuting although displaying behaviour was recorded on three separate occasions at VP3, VP13 and VP15, all during the month of March. Buzzards, observed south-east of VP15 towards the end of the winter period, are believed to have been possibly holding territory. It is likely that this pair is nesting in this area (within 0.5km of the site boundary).

The only other bird of prey recorded during the winter 2015/16 survey period was white-tailed sea eagle which was observed at VP12 prior to the commencement of a transect survey on the 29th March. This was an unusual record for this area. White-tailed sea eagles are both red-listed and an Annex I species. Formally widespread in Ireland, the species has been the focus of a re-introduction programme which has had some success.

5.1.1 Summary/Recommendations

Following the winter 2015/16 surveys it is considered that buzzard is the bird of prey species which is most likely to be potentially impacted by any proposed development at the site. Buzzards are green-listed in Ireland and the European population is considered to be secure (Colhoun and Cummins, 2013). The buzzard population in Ireland is showing one of the greatest increases in distribution and abundance of any bird species recorded by the Breeding Birds Atlas in Ireland over the past 30 years²⁴. The majority of buzzard sightings, and indeed sightings of other birds of prey, occurred within the wide variety of habitats which border areas of cutover peat. Such habitats include but are not limited to areas of scrub, re-vegetating peat, intact bog, farmland, tree-lines and woodland. Like the previous winters surveys (2014/15) buzzards were regularly recorded at VP6 and VP13. It is considered likely that buzzards are breeding in mature trees at both of these locations. Further evidence for this lies in the observation of courtship/displaying behaviour recorded at VP13. Such behaviour was also recorded at VP3 and VP15 indicating that buzzards may well be nesting at several locations within the study area. In particular, areas of willow scrub and other vegetation fringing bare peat in the northern part of the site provides suitable breeding and foraging habitat for this species, as well as providing shelter for the passerine and small mammal species on which it preys.

In terms of potential development at the site it is recommended that any development should avoid, in so much as reasonably possible, excavation of the treeline, hedgerow, scrub and woodland habitats which fringe areas of open, bare peat. These vegetated areas provide important foraging, resting and commuting habitats for a wide variety of bird and mammal species and would also potentially act as buffers to any proposed development within cutover areas.

5.2 WILDFOWL/WADERS/GULLS

The results of the winter 2015/16 surveys have shown that the study area (Lot 1) has a bird assemblage typical of the habitats present. Wildfowl, wader, gull and other species of waterfowl observed during the winter 2015/16 survey period included barnacle goose, Greenland white-fronted goose, greylag goose, mute swan, whooper swan, mallard, teal, golden plover, lapwing, curlew, snipe, cormorant, grey heron, lesser black-backed gull and black-headed gull. The Shannon River is a flyway for a variety of wildfowl and wader species with many observed traversing the site. Such movements were frequently observed from VP1, VP2, VP3, VP4, VP5 and VP6 which is to be expected given their proximity to the River Shannon.

Lough Ree SPA (004064) is situated 330m to the south of Derraghan Bog at its closest point and 540m southwest of the Lanesborough study area. Lough Ree is of high ornithological importance for both wintering and breeding birds. It supports nationally important populations of seven wintering waterfowl species, as well as other important species including whooper swan and Greenland white-fronted goose (both of which are listed on Annex I of E.U. Birds Directive).

Lough Ree is one of the most important Midland sites for wintering waterfowl, with nationally important populations of wigeon (1,475), teal (912), pintail (35), tufted duck (661), goldeneye (137), golden plover (2,035) and lapwing (3,870) occurring (all figures are average peaks for the five seasons 1995/96-1999/00). Regionally important numbers of whooper swan (89) and Greenland

²⁴ <http://www.birdwatchireland.ie/LinkClick.aspx?fileticket=C8vd4RLtsnc%3D&tabid=1165>

white-fronted goose (92) feed in the vicinity of the lake, as do golden plover, lapwing and, to some extent, wigeon and teal. Other species which occur over the winter months include cormorant (64), mallard (675), coot (250), shoveler (40), curlew (167) and great crested grebe (23), as well as the little grebe (34) and mute swan (93) which are resident species. The site supports a nationally important population of common tern (90 pairs in 1990). It is a traditional breeding site for black-headed gull and whilst a full survey has not been carried out in recent years, substantial numbers of nesting birds were present on at least one island in 2003. Lesser black-backed gull and common gull have bred in the past and the latter species may still breed at the site. Lough Ree is also an important site for breeding duck and grebes, with nationally important populations of tufted duck (265 individuals in late May 1995) and great crested grebe (89 individuals in late May 1995). Of particular note is that Lough Ree is one of the two main sites in the country for breeding common scoter, a Red Data Book species. The most recent full census of the site for the species, carried out in 1999 recorded a population of c.32 pairs. The above species were identified during the desk study and were included as target species for the winter 2015/16 survey period. Of the aforementioned species wigeon, pintail, tufted duck, goldeneye, coot, shoveler, great crested grebe, little grebe, common tern, common gull and common scoter were not observed during the most recent survey period on-site (winter 2015/16).

The following table lists all waterfowl species of conservation interest observed during the winter 2015/16 survey period with monthly peak and mean counts given relative to numbers occurring within the Lough Ree SPA (004064) and national wintering populations.

Table 23. Wildfowl, wader and gull species of conservation interest observed during the winter 2015/2016 survey period

Species	Counts during winter 2015/16 survey		Winter count within Lough Ree SPA ²⁵	All-Ireland non-breeding population estimate ²⁶	Breeding population estimate ²⁵	Comments in relation to winter 2015/16 survey results
	Monthly peak count	Monthly mean count				
Barnacle goose (<i>Branta leucopsis</i>)*	13	1	n/a	9,035	n/a	Flock of thirteen observed in December outside of the site boundary. They flew up the River Shannon, near to Lanesborough. This was a good inland record for this species. This record represents 0.14% of the non-breeding population

²⁵ All Lough Ree SPA species counts have been taken from Boland and Crowe, 2012 and refer to the 2006/07 survey period. Where these were not available counts have been sourced from the Natura 2000 Standard Data Form for the Lough Ree SPA (Site code:004064), as denoted by the symbol #

²⁶ Population estimates sourced from BirdWatch Ireland's Action Plan for Lowland Farm Birds and Lake, Fen and Turlough Birds (2011-2020)

Species	Counts during winter 2015/16 survey		Winter count within Lough Ree SPA ²⁵	All-Ireland non-breeding population estimate ²⁶	Breeding population estimate ²⁵	Comments in relation to winter 2015/16 survey results
	Monthly peak count	Monthly mean count				
Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>)*	3	0	92 [#]	10,977	n/a	Three birds observed in November feeding in front of VP7. This record represents 0.03% of the non-breeding population
Greylag goose (<i>Anser anser</i>)	1	0	n/a	5,030	n/a	One bird was observed feeding north of VP6 in January. This record represents 0.02% of the non-breeding population
Mute swan (<i>Cygnus olor</i>)	4	0	161	11,440	Breeding population unknown	The peak count for mute swan was recorded near VP3 in December. This record represents 0.03% of the non-breeding population. Lough Ree is an internationally important site for this species ²⁵
Whooper swan (<i>Cygnus Cygnus</i>)*	144	39	280	15,158	n/a	The largest on-site record for this species was a flock of 72 observed at VP6 in January. The total peak count was 144 which represents 0.9% of the non-breeding population. Lough Ree is a nationally important site for this species ²⁵ . The only regular movements of this species, was over the northern part of the site
Teal (<i>Anas crecca</i>)	25	4	305	45,010	Breeding population unknown	The only on-site observations of teal were at VP2 in December and January. The peak count of represents 0.06% of the non-breeding population. Lough Ree is no longer considered to be of significant importance for this species ²⁵

Species	Counts during winter 2015/16 survey		Winter count within Lough Ree SPA ²⁵	All-Ireland non-breeding population estimate ²⁶	Breeding population estimate ²⁵	Comments in relation to winter 2015/16 survey results
	Monthly peak count	Monthly mean count				
Curlew (<i>Numenius arquata</i>)	1 calling	0	167#	54,650	c.100-200 breeding pairs (RoI)	One call was heard at VP12 in October. No sightings of curlew were made over the course of the winter 2015/16 surveys
Golden plover (<i>Pluvialis apricaria</i>)*	535	119	1,994	166,700	n/a	Largest on-site observation occurred at VP1 in March (flock of 500). The peak count represents 0.32% of the non-breeding population. Lough Ree is a nationally important site for this species ²⁵
Lapwing (<i>Vanellus vanellus</i>)	13	3	5,270	207,700	c.2,000 breeding pairs (RoI)	The peak count of 13, recorded at VP14 in October, represents 0.006% of the non-breeding population. Considered a scarce winter visitor to the site.
Snipe (<i>Gallinago gallinago</i>)	16	5	n/a	Unknown	c.5,000 breeding pairs (RoI)	Snipe were most frequently recorded at VP10 and VP11
Cormorant (<i>Phalacrocorax carbo</i>)	8	1	64#	13,710	c.4,548 breeding pairs (RoI)	This species was recorded at VP1, VP2 and VP3. The peak count represents 0.05% of the non-breeding population
Lesser black-backed gull (<i>Larus fuscus</i>)	75	10	n/a	Unknown	c.2,876 breeding pairs (RoI)	This species was only recorded in March. The only regular movements of this species, was over the northern part of the site
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	3	0	100#	Unknown	c.2,066 breeding pairs (RoI)	There was one record for this species which occurred in March when three birds were observed commuting along the River Shannon

Note: Annex 1 species are denoted with an asterisk (*) and highlighted in bold

Golden plover was commonly observed over the survey period being recorded in every month except September and February with a mean monthly count of 119 birds. Golden plover were most frequently recorded at VP1, VP3, VP7 and VP10. The majority of on-site observations were of birds sitting on the bog roosting, usually near flooded areas, although birds were also observed feeding. A large flock, comprising approximately 500 birds, was recorded at VP1 at the end of March. This flock was observed roosting adjacent to a flooded area of bog north-east of the VP. Golden plover were also regularly observed commuting in particular near the River Shannon. Presumably the same large group was subsequently observed on several occasions over a two day period flying outside the site boundary in this area. Golden plover were also recorded observed in the vicinity of Lough Ree to the west of the site. Golden plover were observed to be almost continuously present near Ballyleague with c. 2,000 - 3,000 birds observed. This group was regularly observed flying up and down the River Shannon and while golden plover appear to mainly occur in the north of the site it is likely that smaller, breakaway groups may occasionally venture into the southern half of the study area. A large flock of 135 birds was observed in January during VP14 flying towards Lough Ree at between 300-400 metres altitude. From the winter 2015/16 observations of golden plover, it is considered that this species typically uses the site for roosting rather than foraging. It is likely that golden plover utilise surrounding farmland as feeding grounds.

Whooper swan was also commonly recorded throughout the survey period, being observed in every survey month except September with a mean monthly count of 39 birds. The majority of whooper swan observations were from the northern half of the site, as was also found during the winter 2014/15 survey period. Whooper swan was most frequently recorded at VP1, VP5 and VP6. Birds were regularly observed in flooded fields along the approach road to VP1 and VP2 depending on water levels. It is believed that these fields may be a traditional gathering site for whooper swan where they frequently come to graze. The flood plains and grassland areas adjacent to the River Shannon provide optimal foraging/roosting habitat for whooper swans in winter which is reflected in the greater number of observations in this area relative to the rest of the site. Whooper swans were regularly recorded commuting across the site and outside the site boundary, often flying in the vicinity of the River Shannon. Birds were also regularly recorded feeding within the site, utilising flash floods on cutover peat as foraging grounds, often in the company of other wildfowl and waders. The largest single observation for this species within the site boundary was recorded in January when a flock of 72 birds was recorded during VP6. This group was observed feeding in a waterlogged area of cutover and sitting on adjacent peat mounds preening and roosting. Additionally a flock of 148 birds were observed in farmland outside of the site boundary, to the north-east of VP6 in February. It is believed that this area, located in Bunacloy/Killeeny, is also a traditional feeding location for this species, from where it is likely that birds disperse to surrounding areas, including within the site when water levels are suitable. This species is highly mobile with movement dependent upon the degree of flooding in suitable foraging habitats. Flooded areas of cutaway bog are regularly utilised by whooper swans as foraging grounds and this is reflected in the results of the winter 2015/16 surveys with such behaviour frequently recorded at VP1, VP5 and VP6.

There were three observations of mute swan over the course of the seven months vantage point surveys. The peak monthly count of four birds was recorded in December. All observations were of birds feeding in flooded areas of bog, often with other species of wildfowl and wader. Mute swans were only recorded in the north of the site with birds observed at VP1, VP3 and VP5.

Snipe was recorded on a regular basis over the winter survey period being recorded in every survey month except September. The vast majority of observations were of birds which had been flushed or otherwise disturbed from a variety of habitats including gorse scrub, drains and intact bog although snipe were also recorded commuting and occasionally feeding in waterlogged areas of bog, in particular at VP2 and VP6. However, snipe were most frequently recorded at VP10 and VP11 in the southern half of the site.

There were only four records of lapwing during the 2015/16 survey period which occurred in October and December although two of these were from outside the site boundary. Within the site a flock of thirteen lapwings were recorded in October commuting towards the south of the site during VP14. Eleven birds were observed feeding in a wet area of bog to the north of VP7 in December. The results of the winter 2015/16 surveys indicate that lapwing are a scarce winter visitor to the site. There was only a single record of curlew when one bird was heard calling from VP12 in October.

Cormorant was recorded commuting through the site on several occasions from both VP1 and VP3. All observations were of individuals flying close to the River Shannon usually in a southerly direction. Teal was recorded near VP2 on two occasions over the course of the survey period. Flocks were seen both feeding and roosting near to flooded areas of bog.

Two species of gull were recorded during the winter 2015/16 survey period, neither of which was recorded during the previous year's surveys. Lesser black-backed gulls were observed on three days in March commuting mainly along the main road adjacent to the site. Birds were typically observed in small groups of 2-3 birds and all were generally heading in a westerly direction. Given the time of year, these birds are likely to have been on migration to breeding grounds in Iceland although it is possible that small numbers may have been en-route to breeding sites on Lough Ree. Black-headed gull was also observed in March when three birds were recorded during VP5 flying outside the site boundary. These individuals flew along the River Shannon heading in a south-westerly direction.

There were only single observations of both Greenland white-fronted goose and greylag goose. Both of these were of birds feeding in wet areas of bog from VP7 and VP6 respectively. These results indicate that these species are scarce winter visitors to the site. Barnacle goose was only recorded outside the site boundary with a flock of thirteen observed near Lanesborough, commuting northwards along the River Shannon, from VP3 in December. Barnacle goose is normally a coastal species therefore an inland record for this species is considered unusual. These birds were possibly blown off-course.

5.2.1 Summary/Recommendations

The winter 2015/16 survey results indicate that golden plover and whooper swan are regular visitors to the site over the winter months utilising flash floods and surrounding areas for both feeding and roosting. In contrast, the results indicate minimal site usage for species such as mute swan, lapwing, snipe, Greenland white-fronted goose and greylag goose. From the results it is evident that some species appear to show a preference for particular areas of the site, as is the case for cormorant, only recorded at the north of the site, while others, such as whooper swan were recorded throughout the entire area, although also mainly to the north.

In summary, as was found during the winter 2014/15 survey period, the principal area of use for wildfowl and waders is the north of the site with the main patterns of movement observed relating to birds commuting between the River Shannon and Lough Ree to the south. The River Shannon is an important area in terms of foraging grounds and acting as a commuting corridor for a wide variety of species. The most regularly recorded patterns of movement related to those of whooper swans commuting predominantly across the north of the site. There are also several areas within this northern section which appear to be used as foraging grounds on a regular basis by whooper swan and other species, in particular areas of cutaway prone to flooding north-east of VP1, north-west of VP6 and immediately north of VP7, as shown on maps in Appendix 3.

Based on these results it is recommended that any future development avoids the areas of bog in the north of the site and instead areas to the south of vantage points 1, 2, 3, 4, 5 should be considered taking regularly recorded flight paths for all target species into account. It is also recommended that usage of flooded cutaway by whooper swans c.2km to the north-west of VP6 should also be taken into account when considering any potential development.

5.3 PASSERINES

Passerines observed within the study area during winter 2015/16 survey period were considered typical of the habitats present. In general passerines were recorded in greater abundances relative to the previous year's surveys with several additional species also observed (Arctic redpoll, blackcap, house martin, sand martin, swallow, wheatear and willow warbler). The majority of species were recorded throughout the survey period from September to March (including goldcrest, linnet, meadow pipit and robin) while others, such as swallow, were recorded in single months only. Arctic redpoll is a rare record for this area. It is believed that this bird is most likely to have come from northern Europe.

5.3.1 Summary/Recommendations

Any proposed development should be cognisant of potential impacts on passerine species utilising the site as any reduction in the abundance of such species would reduce prey abundance for raptors such as sparrowhawk, merlin and hen harrier. However, it is considered that any proposed development at the study area would not have a significant impact on passerine species. It is recommended that any potential development should avoid, where possible, excavations of treelines, hedgerows, scrub, and woodland habitats which fringe open areas of bare peat as these vegetated areas provide foraging, resting and commuting habitats for many smaller bird species. As a result of surveys carried out at the site, it is considered that the open, bare peat areas at the locations of VP8, VP9, VP10 and VP13 are the most suitable areas for any future developments. These vast open areas of bare peat are considered the least ecologically sensitive areas within the subject area.

6 CONCLUSION

Overall the bird species recorded during the winter 2015/16 survey period are largely in keeping with the species recorded during surveys carried out on-site in previous years. The following table lists all species observed during the winter 2015/16 period along with their conservation status and general comments as to their occurrence on-site.

Table 24. All species recorded during the winter 2015/16 survey period

Common Name	Scientific Name	Comments
Arctic redpoll	<i>Carduelis hornemanni</i>	Rare winter visitor
Blackbird	<i>Turdus merula</i>	Resident
Blackcap	<i>Sylvia atricapilla</i>	Summer visitor
Black-headed gull	<i>Chroicocephalus ridibundus</i>	Resident on Lough Ree
Blue tit	<i>Cyanistes caeruleus</i>	Resident
Bullfinch	<i>Pyrrhula pyrrhula</i>	Resident
Buzzard	<i>Buteo buteo</i>	Resident
Chaffinch	<i>Fringilla coelebs</i>	Resident
Chiffchaff	<i>Phylloscopus collybita</i>	Rare winter visitor at the site. Common summer visitor
Coal tit	<i>Parus ater</i>	Resident
Cormorant	<i>Phalacrocorax carbo</i>	Resident on Lough Ree. Frequently congregates along the Shannon, northeast of Mountdillon
Crossbill	<i>Loxia curvirostra</i>	Resident
Curlew	<i>Numenius arquata</i>	Scarce winter visitor
Dunnock	<i>Prunella modularis</i>	Resident
Fieldfare	<i>Turdus pilaris</i>	Winter visitor
Goldcrest	<i>Regulus regulus</i>	Resident
Golden plover*	<i>Pluvialis apricaria</i>	Winter visitor
Goldfinch	<i>Carduelis carduelis</i>	Resident
Great tit	<i>Parus major</i>	Resident
Greenfinch	<i>Carduelis chloris</i>	Resident
Greenland white-fronted goose*	<i>Anser albifrons flavirostris</i>	Scarce winter visitor
Grey heron	<i>Ardea cinerea</i>	Resident
Greylag goose	<i>Anser anser</i>	Scarce winter visitor/feral population possibly in locality
Hen Harrier*	<i>Circus cyaneus</i>	Scarce visitor
Hooded crow	<i>Corvus cornix</i>	Resident
House martin	<i>Delichon urbicum</i>	Summer visitor
House Sparrow	<i>Passer domesticus</i>	Resident where buildings near VPs, particularly at VP7
Jackdaw	<i>Corvus monedula</i>	Resident
Jay	<i>Garrulus glandarius</i>	Scarce resident
Kestrel	<i>Falco tinnunculus</i>	Resident
Kingfisher	<i>Alcedo atthis</i>	Scarce visitor
Lapwing	<i>Vanellus vanellus</i>	Scarce winter visitor
Lesser black-backed gull	<i>Larus fuscus</i>	Scarce winter visitor
Linnet	<i>Carduelis cannabina</i>	Resident
Long tailed tit	<i>Aegithalos caudatus</i>	Resident
Magpie	<i>Pica pica</i>	Resident
Mallard	<i>Anas platyrhynchos</i>	Resident
Merlin*	<i>Falco columbarius</i>	Scarce passage migrant
Meadow pipit	<i>Anthus pratensis</i>	Resident. More frequent in autumn and late winter.

Common Name	Scientific Name	Comments
Mistle thrush	<i>Turdus viscivorus</i>	Resident
Mute swan	<i>Cygnus olor</i>	Scarce winter visitor
Peregrine falcon	<i>Falco peregrinus</i>	Scarce winter visitor
Pheasant	<i>Phasianus colchicus</i>	Resident
Pied wagtail	<i>Motacilla alba</i>	Resident
Raven	<i>Corvus corax</i>	Resident
Redpoll	<i>Carduelis flammea</i>	Resident
Redwing	<i>Turdus iliacus</i>	Winter visitor
Reed bunting	<i>Emberzia schoenichus</i>	Resident
Robin	<i>Erithacus rubecula</i>	Resident
Rook	<i>Corvus frugilegus</i>	Resident
Sand martin	<i>Riparia riparia</i>	Summer visitor
Siskin	<i>Carduelis spinus</i>	Resident and winter visitor
Skylark	<i>Alauda arvensis</i>	Scarce resident. More frequent in autumn and late winter, as breeding birds leave and return.
Snipe	<i>Gallinago gallinago</i>	Scarce resident and winter visitor
Song thrush	<i>Turdus philomelos</i>	Resident
Sparrowhawk	<i>Accipiter nisus</i>	Resident
Starling	<i>Sturnus vulgaris</i>	Resident
Stonechat	<i>Saxicola torquatus</i>	Resident
Swallow	<i>Hirundo rustica</i>	Summer visitor
Teal	<i>Anas crecca</i>	Winter visitor
Water rail	<i>Rallus aquaticus</i>	Scarce visitor
Wheatear	<i>Oenanthe oenanthe</i>	Summer visitor/passage migrant
Whooper swan*	<i>Cygnus cygnus</i>	Winter visitor
Willow warbler	<i>Phylloscopus trochilus</i>	Summer visitor
Woodcock	<i>Scolopax rusticola</i>	Scarce winter visitor at the site
Woodpigeon	<i>Columba palumbus</i>	Resident
Wren	<i>Troglodytes troglodytes</i>	Resident
Total No of Species		67

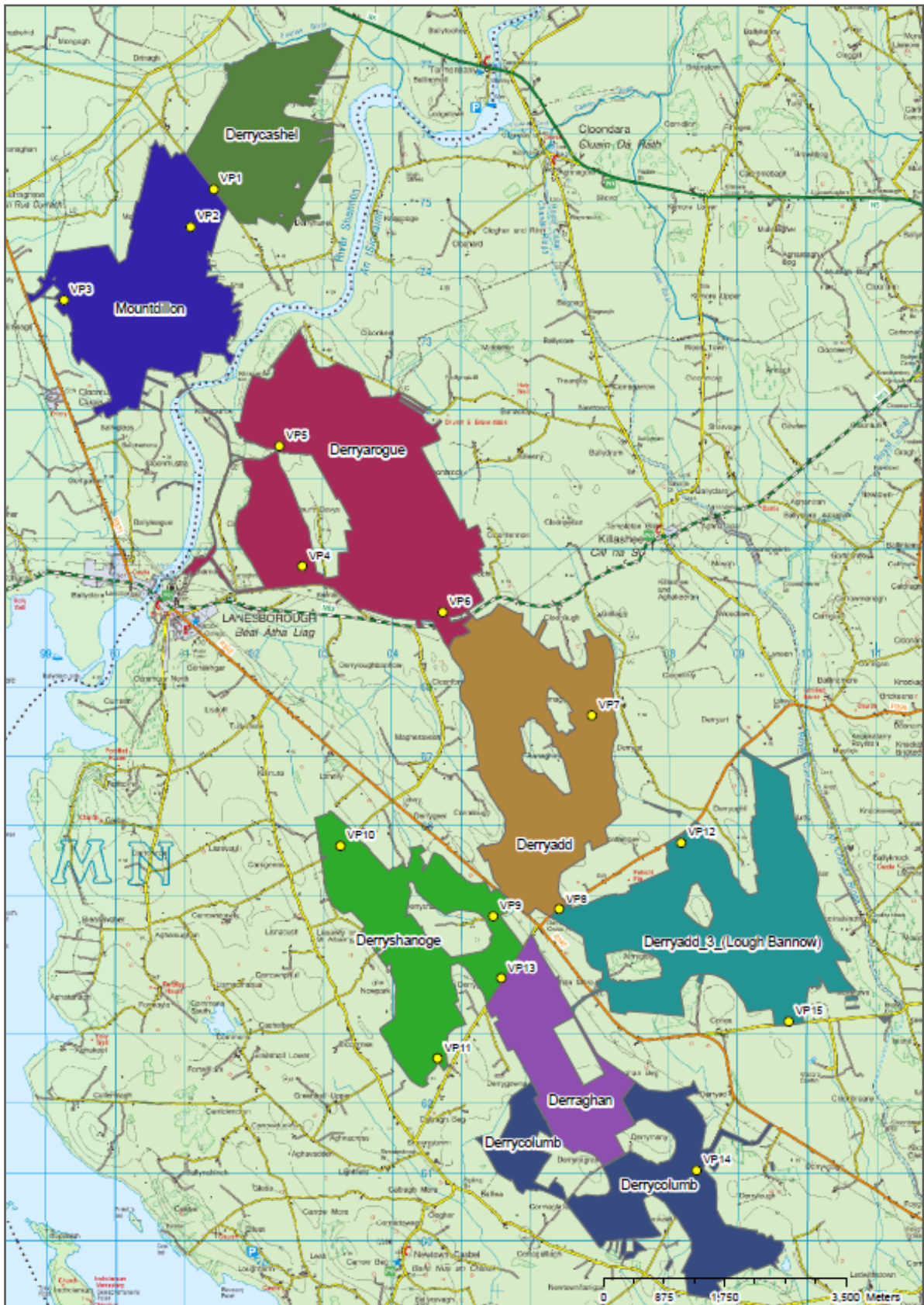
Note: Annex 1 species are denoted with an asterisk (*) and highlighted in bold

7 REFERENCES

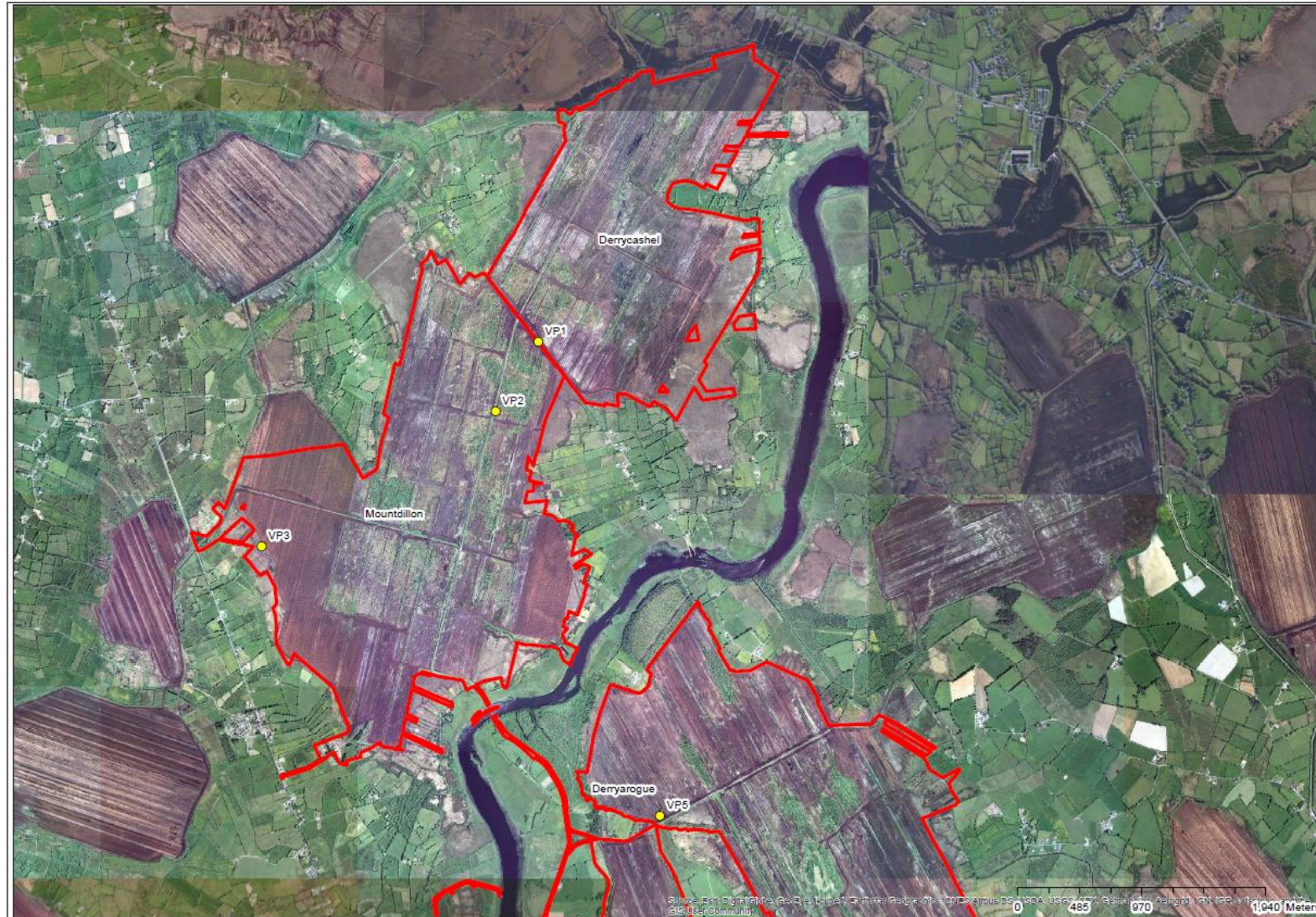
- Anon, (2003). Unpublished methodology agreed between National Parks and Wildlife Service, BirdWatch Ireland and the Irish Raptor Study Group for Hen Harrier monitoring.
- BirdWatch Ireland, 2011. *Action Plan for Lake, Fen and Turlough Birds in Ireland 2011-2020*. BirdWatch Ireland's Group Action Plans for Irish Birds, Kilcoole, Co. Wicklow: BirdWatch Ireland.
- BirdWatch Ireland, 2011. *Action Plan for Lowland Farm Birds in Ireland 2011-2020*. BirdWatch Ireland's Group Action Plans for Irish Birds, Kilcoole, Co. Wicklow: BirdWatch Ireland.
- Boland, H. & Crowe, O., 2012. *Irish wetland bird survey: waterbird status and distribution 2001/02 - 2008/09*, Kilcoole, Co. Wicklow: Birdwatch Ireland.
- Colhoun, K. & Cummins, S., 2013. Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds*, Volume 9, pp. 523-544.
- Colhoun, K. & Cummins, S., 2013. Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds*, Volume 9, pp. 523-544.
- Crowe, O. (2005) Ireland's Wetlands and their Waterbirds, Status and Distribution. BirdWatch Ireland, Newcastle, Co. Wicklow.
- EU, 1992. *Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora*, Luxembourg: The Council of the European Communities.
- EU, 2009. *Directive 2009/147/EC of the European Parliament and of the Council on the Conservation of Wild Birds (codified version)*, Luxembourg: European Parliament and the Council of the European Union.
- Fox, A.D., Norriss, D.W., Stroud, D.A. & Wilson, H.J. (1994). Greenland White-fronted 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, G., Gibbons, D.W., and Evans J., (1998). Bird Monitoring Methods – A manual for key UK species. RSPB.
- Madders, M. (2000). Habitat selection and foraging success of Hen Harriers *Circus cyaneus* in west Scotland. *Bird Study*. 47, 32-40.
- Moore, N., Kelly, P. & Lang, F., 1992. Quarry-nesting by Peregrine Falcons in Ireland. *Irish Birds*, 4(4), pp. 519-524.
- NPWS, 2012a. *Conservation Objectives: River Shannon and River Fergus Estuaries SPA (004077)*. Version 1.0, Dublin, Ireland: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS, 2014. *Natura 2000 Standard Form: Lough Ree SPA (Site code: IE0004064)*, Dublin, Ireland: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- Percival, S.M. (2003). Birds and Wind farms in Ireland: A Review of Potential Issues and Impact Assessment. Sustainable Energy Ireland.

Appendix 1

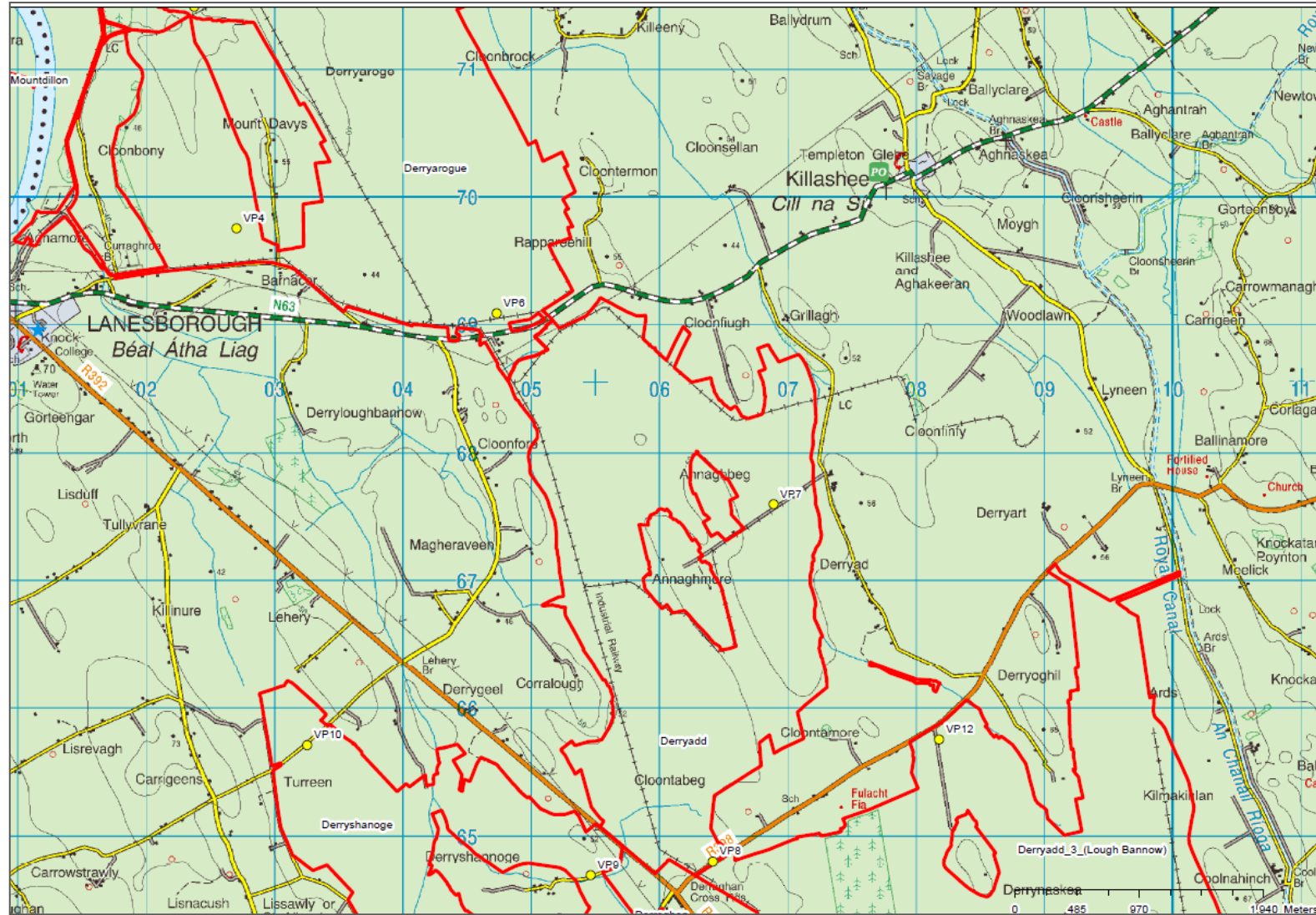
Vantage Point and Transect Figures



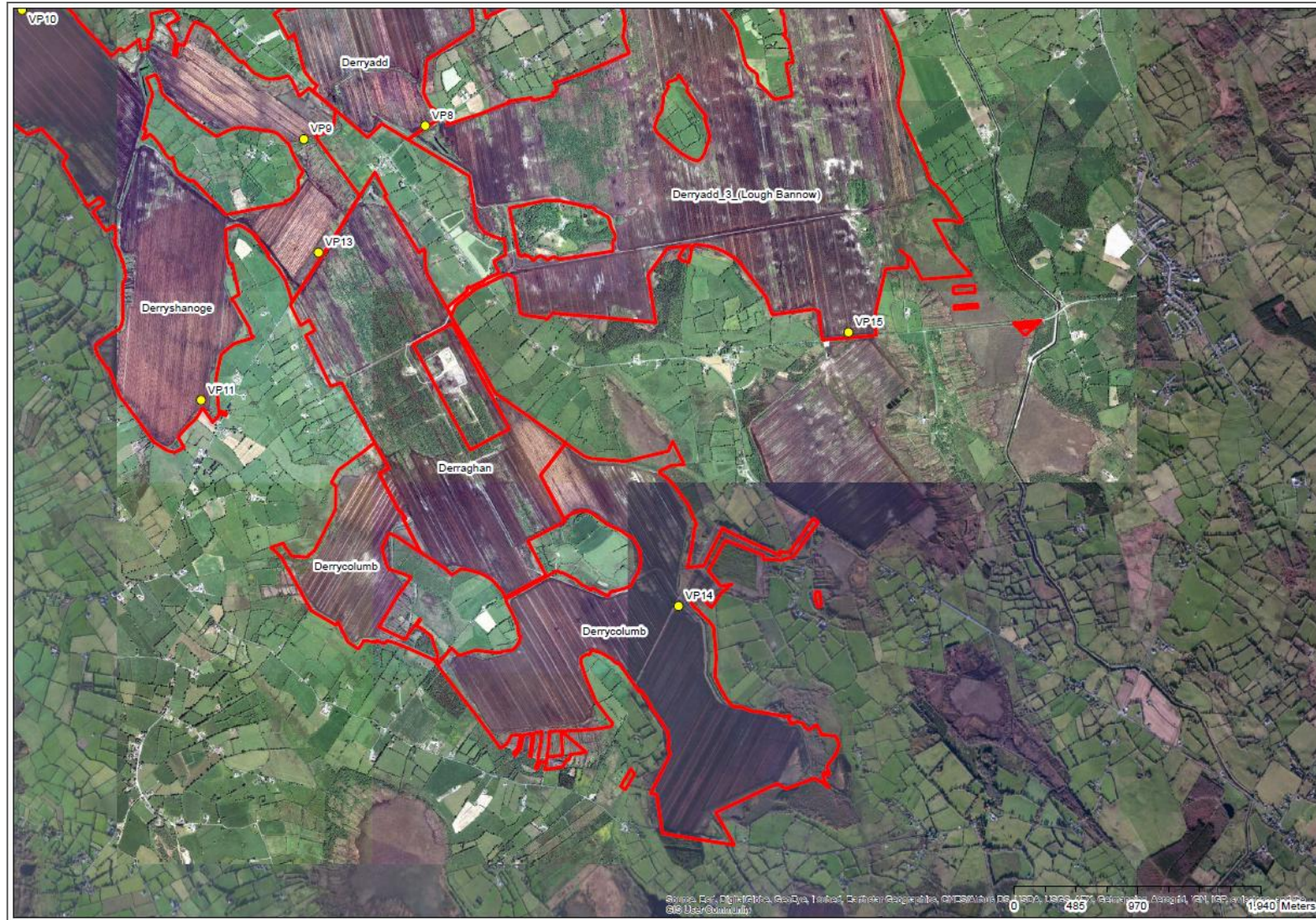
Overall Bog Boundaries and Vantage Point Locations (Discovery)



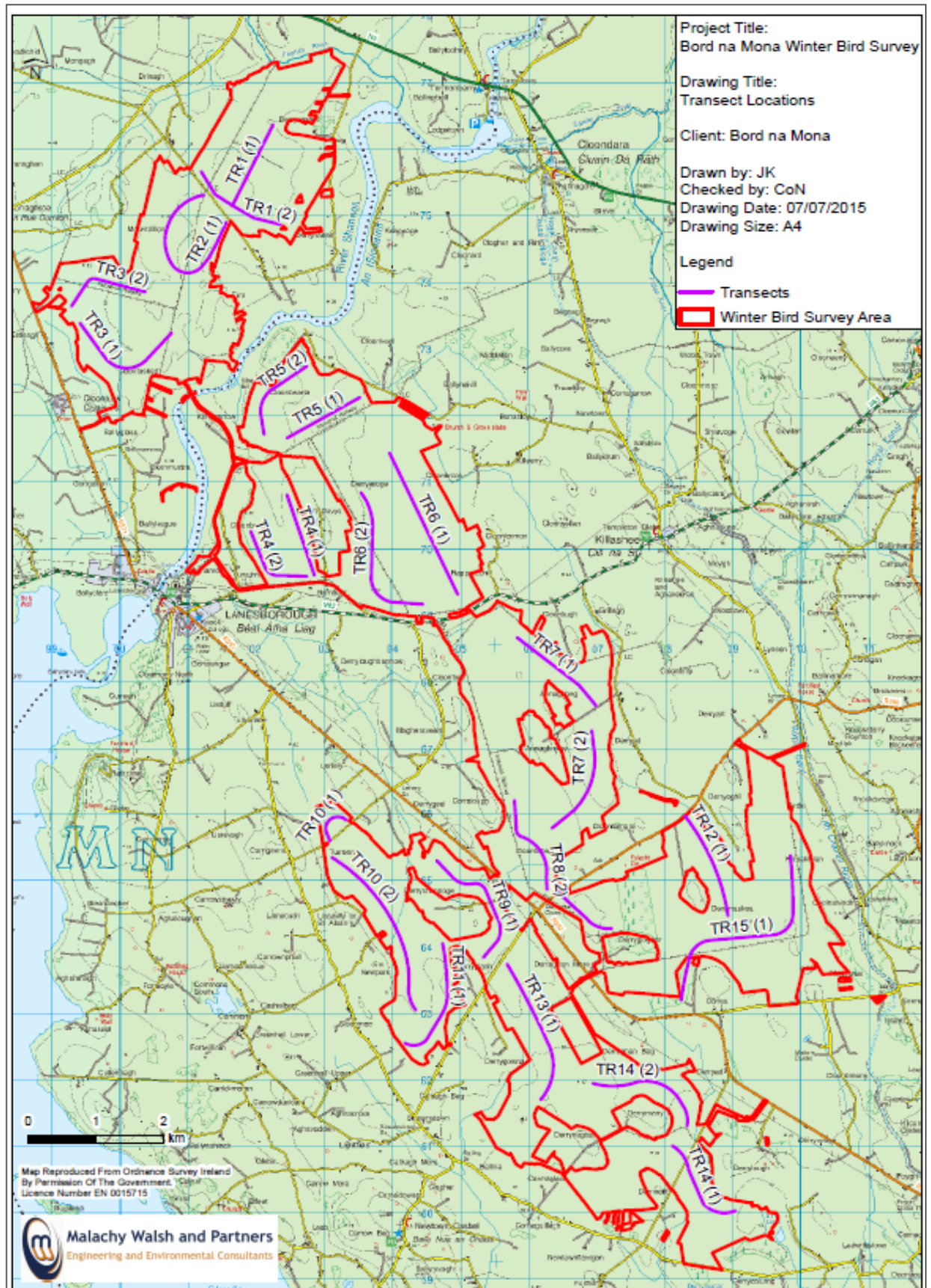
Section 1: Bog Boundaries and Vantage Point Locations (Aerial)



Section 2: Bog Boundaries and Vantage Point Locations (Discovery)



Section 3: Bog Boundaries and Vantage Point Locations (Aerial)



Bog Boundaries and Transect Routes

Appendix 2

Vantage Point Survey Watch Summary Table

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
08/09/2015	J.A	4	13.15	16.15	3	Sunny, hazy at time, some cloud, blustery, wind SE F4, temp 17-18C
08/09/2015	J.A	6	10.00	13.00	3	Clear, sunny at times with cloud, becoming warmer, wind SE F4, temp 15-17C
09/09/2015	J.A	5	15.30	18.30	3	Dull, overcast with occasional bright spells, wind SE F3-4, temp 14-15C
09/09/2015	J.A	6	12.15	15.15	3	Bright, cloudy at times with some haze, occasional sun, wind SE F4, temp 12C
09/09/2015	J.A	7	9.00	12.00	3	Bright , overcast and hazy, sunny from 10.00 onwards, blustery, wind SE F4-5, temp 10C
09/09/2015	A.C	8	8.50	11.50	3	Overcast, hazy, sunshine at first, wind SE F1-2, temp 14-18C
09/09/2015	A.C	12	12.10	15.10	3	Cloudy, sunshine last hour, overcast, wind SE F1-2, temp 17-20C
10/09/2015	J.A	4	11.45	14.45	3	Hazy, overcast, bright at time, blustery, wind SE F4-5, temp 9-10C
10/09/2015	J.A	5	15.00	18.00	3	Hazy, bright with blanket cloud, blustery, wind SE F4-5, temp 14-15C
10/09/2015	J.A	7	8.30	11.30	3	Bright, sunny, overcast at times, blustery, cool, wind SE F4-5, temp 8-9C
10/09/2015	A.C	14	8.50	11.50	3	Hazy sunshine, wind SE F1-2, temp 13-18C
10/09/2015	A.C	15	12.15	15.15	3	Hazy sunshine, wind SE F1-2, temp 17-20C
11/09/2015	J.A	9	12.30	15.30	3	Rain, easing at times, dull, overcast, wind SW F1-2, temp 12C
11/09/2015	J.A	10	9.00	12.00	3	Persistent rain, dull, overcast, wind SW F1-2, temp 12C
12/09/2015	J.A	2	9.00	12.00	3	Bright, sunny, clear, some cloud, wind SW F3-4, temp 14C
12/09/2015	J.A	3	12.15	15.15	3	Bright, sunny, clear, cloudy and blustery at times, wind SW F3-4, temp 15C
15/09/2015	A.C	14	12.15	15.15	3	Cloudy, sunny intervals, showers, wind NW F1-2, temp 14-16C
15/09/2015	A.C	15	8.50	11.50	3	Cloud cover 8/8, sunshine for last 1.5hrs, wind calm at first then NW F1-2, temp 11-16C
16/09/2015	A.C	11	8.45	11.45	3	Fog at first then sunshine, cloud cover 4/8, wind calm, temp 6-14C
16/09/2015	A.C	13	12.15	15.15	3	Sunshine, cloud cover 4/8, light breeze, temp 15-16C
17/09/2015	A.C	8	12.15	15.15	3	Cloud cover 6/8, wind SW F1, temp 14-16C
17/09/2015	A.C	12	9.00	12.00	3	Misty, cloud cover 8/8, wind SW F1, temp 11-16C
18/09/2015	A.C	11	12.10	15.10	3	Sunshine, cloud cover 8/8, wind NW F1-2, temp 16-18C
18/09/2015	A.C	13	8.45	11.50	3	Light mist, cloud cover 8/8, wind NW F1, temp 14-17C
22/09/2015	J.A	9	12.00	15.00	3	Bright, sunny, quite cold, occasional light shower, wind NW F4-5, temp 8-10C
23/09/2015	J.A	3	12.45	15.45	3	Rain showers at first then bright with some cloud, wind SW F2-3, temp 12-14C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
24/09/2015	J.A	1	11.00	14.00	3	Bright with cloud, occasional light shower, quite blustery, wind SW F4, temp 14-15C
30/09/2015	J.A	1	12.30	15.30	3	Bright, sunny, hazy, cool, temp 12C, wind ENE F2-3 becoming F4-5
30/09/2015	J.A	2	15.30	18.30	3	Bright, hazy becoming duller later, wind ENE F3-4, temp 12C
30/09/2015	J.A	10	9.00	12.00	3	Bright, cool, wind NNE F2-3, temp 8-10C
06/10/2015	A.C.	14	12.15	15.15	3	Intermittent sunshine, cloud cover 6/8, wind SE F1-2, temp 18-21C
06/10/2015	A.C.	15	9.00	12.00	3	Hazy sunshine, cloud cover 4/8, wind SE F1, temp 12-17C
09/10/2015	A.C.	14	9.00	12.00	3	Intermittent sunshine, cloud cover 7/8, wind SE F1-2, temp 12-15C
09/10/2015	A.C.	15	12.15	15.15	3	Hazy sunshine, cloud cover 8/8, wind SE F1-2, temp 15-17C
12/10/2015	J.A.	4	11.30	14.30	3	Bright, sunny, calm, clear, wind NW F2-3, temp 15C
12/10/2015	J.A.	5	14.45	17.45	3	Bright, calm, sunny, clear, wind NW F2-3, temp 15C
13/10/2015	J.A.	2	10.00	13.00	3	Bright, sunny, clear, wind SE F1-2, temp 8C
13/10/2015	J.A.	3	13.15	16.15	3	Bright, clear, sunny, calm, wind SE <F1, temp 15C
13/10/2015	A.C.	12	9.00	12.00	3	Fog at first, hazy sunshine, wind calm, temp 10-11C
13/10/2015	A.C.	13	12.15	15.15	3	Calm at first, sunshine, cloud cover 2/8, wind SE F1 for last hour, temp 11-15C
14/10/2015	J.A.	2	10.00	13.00	3	Dense fog at first, gradually lifting with sun, bright and clear, wind S <F1, temp 6-8C
14/10/2015	J.A.	4	13.15	16.15	3	Bright, cloudy with sun, mild and clear, wind S F1-2, temp 10C
14/10/2015	A.C.	12	12.20	15.20	3	Hazy sunshine, cloud cover 2/8, wind S F1-2, temp 13-16C
14/10/2015	A.C.	13	9.10	12.10	3	Hazy sunshine, SE breeze, temp 7-14C
15/10/2015	J.A.	1	12.30	15.30	3	Dull, overcast becoming bright and clear, wind S F1-2, temp 12C
15/10/2015	J.A.	5	9.00	12.00	3	Dull, overcast, cloudy but clear, wind S F1-2, temp 8-10C
15/10/2015	A.C.	10	12.30	15.30	3	Hazy sunshine, cloud cover 4/8, wind SE F1, temp 12-17C
15/10/2015	A.C.	11	9.00	12.00	3	Wind calm, cloud cover 8/8, temp 8-11C
16/10/2015	J.A.	1	9.30	12.30	3	Dense fog, cool, visibility poor, wind S <F1, temp 4C
16/10/2015	J.A.	3	12.35	15.35	3	Dense fog with occasional clearance but visibility poor, wind S <F1, temp 6C
16/10/2015	A.C.	10	9.15	12.15	3	Heavy fog, visibility to 300m, wind calm, temp 4-10C
16/10/2015	A.C.	11	12.30	15.30	3	Light fog at first, wind N F1, temp 9-14C
19/10/2015	A.C.	8	12.15	15.15	3	Calm at first, cloud cover 8/8, wind NE F1 from 14.00pm, temp 13-15C
19/10/2015	A.C.	9	9.00	12.00	3	Calm, cloud cover 7/8, temp 9-12C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
20/10/2015	A.C.	8	9.00	12.00	3	Light fog, hazy sunshine, cloud cover 5/8, wind calm, temp 7-12C
20/10/2015	A.C.	9	12.30	15.30	3	Rain from 14.00pm, cloud cover 8/8, wind SW F1, temp 12-15C
22/10/2015	A.C.	6	13.00	16.00	3	Occasional sunshine, cloud cover 4/8, wind W F2-3, temp 14C
22/10/2015	A.C.	7	9.45	12.45	3	Hazy sunshine, cloud cover 3/8, wind S F1, temp 10-15C
23/10/2015	A.C.	6	9.15	12.15	3	Hazy sunshine, cloud cover 6/8, wind S F2-3, temp 10-14C
23/10/2015	A.C.	7	12.30	15.30	3	Hazy sunshine at first, cloud cover 8/8, heavy rain from 14.10pm, wind S F2-4, temp 13-14C
28/10/2015	JNM	14	13.45	16.45	3	Dry, sunny spells with some cloud cover in afternoon, visibility good, wind S-SE F1-4, temp 15C
28/10/2015	JNM	15	10.30	13.30	3	Dry with long sunny spells, visibility excellent, wind SE - S F1-3, temp 13C
29/10/2015	JNM	14	9.00	12.00	3	Clear with sunny spells, cloud pushing in from west, light showers, visibility good, wind N-NW F1-2 turning SW, temp 9-11C
29/10/2015	JNM	15	12.10	15.10	3	Dry, good spells of sunshine, visibility good, wind S-SW F2-4, temp 12C
04/11/2015	JNM	8	10.30	13.30	3	Calm, foggy morning clearing to bright sunshine, visibility very good, wind slack SW, temp 11C
04/11/2015	JNM	12	13.45	16.45	3	Dry, sunny spells, visibility good, wind slack, WNW shifted to E by end of day, temp 12C
05/11/2015	JNM	8	12.30	15.30	3	Heavy showers, cleared occasionally to bright spells, visibility fair, wind S-SE F1-2 veering SW F3 by evening, temp 14C
05/11/2015	JNM	12	9.00	12.00	3	Wet, dull, overcast morning, visibility fair, wind S-SE, F1-2, temp 10C
11/11/2015	JNM	6	14.00	17.00	3	Windy but dry afternoon with few sunny spells, wind SW-W F4-5, temp 13C
11/11/2015	JNM	7	10.30	13.30	3	Damp, misty, wet morning, clearing to dry spells, visibility good, wind S-SW F2-4/5, temp 12C
12/11/2016	JNM	6	9.00	12.00	3	Dry, cold, blustery day, visibility very good, wind SW F5-6, temp 11C
12/11/2015	JNM	7	12.30	15.30	3	Dry, low cloud cover, strong winds, heavy showers, visibility very good, wind SW F5-6, temp 14C
17/11/2015	JNM	9	10.00	13.00	3	Persistent rain, heavy at times with some clearance, dark and dull, visibility moderate, wind SSW F3-5, temp 8C
17/11/2015	JNM	10	13.15	16.15	3	Very wet and windy, heavy showers, visibility poor to moderate, wind SW F5-7 shifted W F7-8, temp 8-12C
18/11/2015	J.A.	3	12.45	15.45	3	Heavy showers at first then sun, visibility good, wind SW F5, temp 6-7C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
18/11/2015	JNM	9	13.40	16.40	3	Showers with some sunny intervals, visibility good, wind WNW F7-8, temp 9-10C
18/11/2015	JNM	10	10.30	13.30	3	Wet, windy, dark and overcast, heavy showers, some sunshine, wind NW F7-8, gale force at times, temp 10-12C
19/11/2015	J.A.	1	10.00	13.00	3	Sunny, occasional showers, visibility very good, wind SW F4, temp 8C
19/11/2015	J.A.	2	13.00	16.00	3	Sunny, visibility excellent, wind SW F4, temp 8-9C
19/11/2015	A.C.	11	13.15	16.15	3	Intermittent hazy sunshine, visibility good, wind W gusting, F1-3, temp 9C
19/11/2015	A.C.	13	9.10	12.15	3	Intermittent hazy sunshine, cloud cover 6/8, visibility good, wind W F1-2, temp 8-10C
20/11/2015	A.C.	11	9.15	12.25	3	Intermittent sunshine, showers, cloud cover 6/8, visibility good, wind W F1-3, temp 4-10C
20/11/2015	A.C.	13	12.30	15.30	3	Intermittent sunshine, showers, cloud cover 6/8, visibility good, wind NW F1-3 gusting, temp 5-9C
24/11/2015	A.C.	4	9.30	12.30	3	Showers, cloud cover 8/8, wind NW gusting F1-3, temp 9-10C
24/11/2015	JNM	4	13.30	16.30	3	Weather closed in during afternoon with misty rain, wind WNW F3-4, temp 9-10C
24/11/2015	A.C.	5	13.30	16.30	3	Showers, cloud cover 8/8, wind NW gusting F1-3, temp 10C
24/11/2015	JNM	5	9.30	12.30	3	Damp, wet, misty morning, visibility moderate, wind WNW F2-4, temp 9C
02/12/2015	JNM	7	13.30	16.30	3	Dry, sunny, cool, wind slack NW, temp 10C
02/12/2015	JNM	12	10.30	13.30	3	Dry, calm morning with sunny spells, visibility good, wind slack NW F1-2, temp 11-14C
03/12/2015	JNM	7	9.30	12.30	3	Dark, dull, wet morning, visibility moderate, wind slack W-NW, heavy rain from 10.15 to 12.30, temp 5-6C
03/12/2015	A.C.	9	9.30	12.30	3	Continuous heavy rain, cloud cover 8/8, visibility moderate, wind calm, temp 6C
03/12/2015	A.C.	10	13.30	16.30	3	Cloud cover 8/8, continuous heavy rain at 16.00pm, visibility moderate, wind NW F1, temp 4-5C
03/12/2015	JNM	12	13.30	16.30	3	Persistent heavy rain, dull, dark, visibility poor, wind slack NW-N, picking up to F2-3, rain all day, eased at 15.30pm, temp 5C
04/12/2015	A.C.	9	12.40	15.40	3	Low cloud cover 8/8, visibility moderate, wind SW F2-3, F4-6 from 14.00pm on, gusting, temp 12C
04/12/2015	A.C.	10	9.30	12.30	3	Cloud cover 7/8, visibility good, wind SW F1-3, temp 8-12C
06/12/2015	J.A.	4	9.30	12.30	3	Dull, overcast, calm, visibility good, wind SW F1-2, temp 5-6C
06/12/2015	J.A.	5	12.45	15.45	3	Dull, overcast becoming foggy, visibility good/fair, wind SW F1-2, temp 4-5C
07/12/2015	J.A.	4	9.30	12.30	3	Bright at first becoming cloudy, visibility excellent, wind SE F4-5, temp 8-9C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
07/12/2015	J.A.	6	12.45	15.45	3	Dull, overcast, cloudy, visibility good, wind SE F4-5, temp 7-8C
07/12/2015	A.C.	11	12.15	15.15	3	Cloud cover 8/8, rain from 14.40pm, visibility moderate to poor, wind S F2-4 increasing to F4-6 from 14.40pm, temp 12-14C
07/12/2015	A.C.	13	9.00	12.00	3	Cloud cover 6/8, visibility good, wind S F2-4, temp 14C
08/12/2015	J.A.	5	9.30	12.30	3	Bright, calm, sunny, rain at 11.00am, visibility excellent, wind SW F1-2, occasionally F2-3, temp 5-6C
08/12/2015	J.A.	6	12.45	15.45	3	Dull, rain, overcast, visibility good to fair, wind SW F3-4, temp 5-6C
08/12/2015	A.C.	11	9.15	12.15	3	Cloud cover 3/8 increasing to 8/8, heavy rain showers, visibility moderate, continuous rain from 10.54am with intermittent downpours, wind S F2-3, temp 8C
08/12/2015	A.C.	13	12.30	15.30	3	Cloud cover 8/8, rain showers, intermittent sunshine, visibility good, wind SW F2-4, temp 8C
09/12/2015	JNM	14	13.30	16.30	3	Wet, overcast, dark and windy, heavy rain at times, visibility moderate, wind S-SW-W storm to gale force, temp 12C
09/12/2015	JNM	15	10.00	13.00	3	Dry early on with showers later on, visibility good, wind S-SW F4-6/7, storm force by midday, temp 11C
10/12/2015	JNM	14	9.00	12.00	3	Dry, sunny morning, visibility excellent, wind S-SW F1-4, rain at 11.00am, temp 5C
14/12/2015	A.C.	3	13.15	16.15	3	Intermittent light showers, cloud cover 8/8, visibility moderate, wind SEW F2-3, temp 10C
14/12/2015	JNM	3	10.00	13.00	3	Dull, wet, grey morning with some showers, visibility poor, wind S-SE F1-3, temp 6-10C
14/12/2015	JNM	8	13.15	16.15	3	Dry and bright, visibility moderate, wind S-Se F2-4 turning E by end of watch, temp 8-12C
14/12/2015	A.C.	8	10.00	13.00	3	Continuous heavy rain, cloud cover 8/8, visibility poor, wind SE F1-2, temp 9-11C
15/12/2015	JNM	1	9.30	12.30	3	Dry, dull morning, some light rain at 12.30, visibility good, wind S F2-3, temp 11C
15/12/2015	JNM	2	12.45	15.45	3	Dull, dry, visibility good, wind S F3-5, temp 11C
16/12/2015	JNM	1	12.45	15.45	3	Dull, overcast with some dry periods, wind S-SW F2-4 turning W by 14.30pm, temp 12C
16/12/2015	JNM	2	9.30	12.30	3	Damp, dull, misty morning, visibility moderate, wind S-SW F2-3, temp 12C
20/12/2015	JNM	15	12.30	15.30	3	Dry at times with showery intervals, visibility good, wind SW - W, heavy rain at 15.00pm, temp 7C
06/01/2016	JNM	14	10.30	13.30	3	Cold, dry, sunny, visibility excellent, wind SE-S F1-4, temp 3-4C
06/01/2015	JNM	15	13.45	16.45	3	Dry, cold, overcast, visibility good, wind SE-S F1-4, temp 5-6C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
07/01/2016	JNM	14	12.15	15.15	3	Sunny, dry spells, visibility excellent, wind S-SW F4, temp 3-4C
07/01/2016	JNM	15	9.00	12.00	3	Cold, dry, some rain later in morning, visibility excellent, wind SE-S F1-3, SW F 3-4, showers at 11.30am, temp 3-4C
08/01/2016	JNM	8	10.00	13.00	3	Damp, drizzly morning with some sunny spells, visibility good, wind W F1-4, temp 4-5C
08/01/2016	JNM	12	13.30	16.30	3	Sunshine with showers, visibility good, wind W F2-4, temp 6C
13/01/2016	JNM	8	13.35	16.35	3	Wet, cold, dark with heavy showers, visibility poor, wind W F3-5, temp 4-6C
13/01/2016	JNM	12	10.30	13.30	3	Wet, damp, cold, dark morning with heavy showers, visibility poor, wind W F3-4, temp 3-4C
14/01/2016	JNM	6	13.00	16.00	3	Fine warm sunshine followed by heavy snow, visibility excellent then poor, wind N veering NW, F1-4, temp 5/6 to 1C
14/01/2016	JNM	7	9.30	12.30	3	Dry, cold, sunny morning, visibility excellent, wind slack N F1, temp 0-4C
14/01/2016	A.C.	9	13.30	16.30	3	Heavy snow showers, rain showers, cloud cover 8/8, visibility moderate, wind NW F1-2, temp 2C
14/01/2016	A.C.	13	9.30	12.30	3	Cloud cover 6/8, hazy sunshine, visibility good, wind calm at first, NW F1 from 11.00am, temp 1-6C
15/01/2016	A.C.	9	9.30	12.30	3	Cloud cover 2/8, sunshine, snow on ground, visibility good, wind W F1, temp 1-4C
15/01/2016	A.C.	13	12.35	15.35	3	Cloud cover 2/8, sunshine throughout, visibility good, wind W F1-2, temp 4-5C
19/01/2016	JNM	6	10.30	13.30	3	Calm, overcast, cool morning, visibility good, wind W F1-2, temp 6C
19/01/2016	JNM	7	13.35	16.35	3	Dry, overcast with some sunny spells, visibility good, wind W slack F1-2, temp 7-9C
20/01/2016	JNM	4	10.00	13.00	3	Calm, sunny, dry morning, visibility excellent, wind S F1, temp 2-3C
20/01/2016	JNM	5	13.30	16.30	3	Dry, overcast, cold, sunny spells, visibility excellent, wind S F1-2, temp 6C
21/01/2016	JNM	4	10.30	13.30	3	Slightly overcast but mainly dry, low cloud cover, visibility good, wind S-SW F2-3, temp 12C
21/01/2016	JNM	5	9.00	12.00	3	Damp, dark, wet morning, visibility moderate, wind S-SW F1-3, temp 10C
22/01/2016	JNM	10	10.30	13.30	3	Dry, sunny, mild morning, visibility excellent, wind W F4-5, showers at 12.40pm, temp 11C
22/01/2016	JNM	11	13.45	16.45	3	Heavy showers with some sunny spells, visibility excellent, wind W-SW F5-6, temp 11-12C
26/01/2016	A.C.	1	10.00	13.00	3	Heavy mist, cloud cover 8/8, visibility moderate to poor, wind W gusting F5-6, temp 13C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
26/01/2016	JNM	1	13.15	16.15	3	Bright clear spells in the afternoon, fewer showers, visibility moderate - good, wind W-NW F6-7, temp 13C
26/01/2016	JNM	2	10.00	13.00	3	Very wet, dull, dark morning with high winds, visibility bad to fair, wind W-NW F6-7, temp 12-13C
26/01/2016	A.C.	2	13.15	16.15	3	Cloud cover 7/8 at first, sunshine, visibility good, wind W F5-6, temp 11-13C
27/01/2016	JNM	3	13.30	16.30	3	Dry, sunny, some heavy showers, visibility good, wind NW F4-5, temp 7-8C
27/01/2016	JNM	10	13.30	16.30	3	Windy, sunshine and showers, visibility good, wind W-NW F4-6, temp 8-9C
27/01/2016	JNM	11	9.30	12.30	3	Dry morning with sunny spells, clouding over, visibility good, wind W-NW F3-5, temp 6C
28/01/2016	JNM	3	9.00	12.00	3	Wet, cold, windy morning with heavy showers, visibility moderate, wind W-NW F4-6, temp 5-6C
02/02/2016	JNM	14	10.30	13.30	3	Wet, windy, damp dull morning, some heavy showers, visibility moderate, wind NW-N F4-5, temp 4-5C
02/02/2016	JNM	15	13.45	16.45	3	Drier than earlier, light showers, visibility good, wind W F2-4 veering NW, hail showers, temp 7C
03/02/2016	JNM	14	14.00	17.00	3	Dry, overcast afternoon with clear, dry spells, visibility good, wind N-W F2-3, temp 9C
03/02/2016	JNM	15	10.30	13.30	3	Bright morning with dry, sunny spells, visibility good, wind S F1-2, temp 6C
04/02/2016	JNM	8	9.00	12.00	3	Overcast, dull morning with few scattered showers, visibility good, wind W-NW F1-2/3, temp 11C
04/02/2016	JNM	12	14.00	16.00	3	Overcast and dull but dry in afternoon, few showers, visibility good, wind W-NW F1-2/3, temp 11C
05/02/2016	JNM	8	13.30	16.30	3	Very wet and dull, overcast, dry on occasion, visibility poor, wind W-SW F2-4, temp 10-11C
05/02/2016	JNM	12	10.00	13.00	3	Very wet, dull morning, visibility bad, wind SW-W F2-4, temp 9-10C
09/02/2016	JNM	6	10.00	13.00	3	Heavy snow, showers, sleet and rain, visibility poor, wind W-NW, temp 0-3C
09/02/2016	A.C.	7	10.00	13.00	3	Cloud cover 8/8, snow/sleet, heavy rain, visibility poor, wind NW F1-3, temp 2-3C
11/02/2016	A.C.	4	9.00	12.00	3	Heavy fog for duration, visibility poor, wind calm, temp 3-4C
11/02/2016	A.C.	5	13.00	16.00	3	Cloud cover 5/8, intermittent sunshine, visibility good, wind calm, temp 5-8C
12/02/2016	A.C.	4	13.00	16.00	3	Cloud cover 7/8, light showers, visibility moderate, wind light easterly breeze, temp 5C
12/02/2016	A.C.	5	9.30	12.30	3	Heavy fog, cleared at 11.20, cloud cover 7/8, visibility poor/moderate, wind light N breeze, temp 2-5C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
16/02/2016	JNM	6	13.30	16.30	3	Wet and windy, some heavy showers, wind W-SW veering S F3-6, temp 15C
16/02/2016	JNM	7	10.00	13.00	3	Wet, windy, dull, cloud cover 8/8, heavy rain showers, visibility poor, wind S-SW F3-6, temp 9C
17/02/2016	JNM	9	14.30	17.30	3	Cold, sunny, bright spells, visibility excellent, wind NW-N F1-3, temp 7C
17/02/2016	JNM	13	11.00	14.00	3	Started wet but cleared to fine dry sunshine by midday, visibility good, wind W-SW F1-3, temp 5-6C
18/02/2016	JNM	9	9.00	12.00	3	Dry, cold, sunny morning, visibility very good, wind W F2-3, temp 0-7C
18/02/2016	JNM	13	12.30	15.30	3	Dry, sunny, cool, showers late afternoon, visibility very good, wind W F1-3, veering NW, temp 7-15C
19/02/2016	JNM	10	10.30	13.30	3	Misty wet morning, visibility poor, wind W F3-4, temp 9-11C
19/02/2016	JNM	11	13.45	16.45	3	Damp, dull, misty showers, visibility moderate, wind W F2-3 veering SW in evening, temp 11C
24/02/2016	JNM	1	10.30	13.30	3	Cold dry morning with sunny spells, visibility excellent, wind N-NW F1-2, temp 0-6C
24/02/2016	A.C.	1	14.00	17.00	3	Cloud cover 7/8, intermittent sunshine, wind N F2-3, temp 6-8C
24/02/2016	A.C.	2	10.30	13.30	3	Cloud cover 6/8, intermittent sunshine, wind W F1-2, NW F2-3 from 12.40pm, temp 3-6C
24/02/2016	JNM	2	14.00	17.00	3	Dry, cold day, visibility excellent, wind NW-W F1-2, temp 0-6C
25/02/2016	JNM	3	9.30	12.30	3	Dry, cold morning with some sunny spells, visibility very good, wind W-NW F1-2, temp 0-4C
25/02/2016	A.C.	3	13.00	16.00	3	Cloud cover 8/8, visibility good, wind S F2-3, temp 6-7C
25/02/2016	A.C.	10	9.30	12.30	3	Cloud cover 8/8, hazy sunshine from 10.40, visibility good, wind SW F1-2, temp 2-6C
25/02/2016	JNM	11	13.00	16.00	3	Cold, dry, sunny afternoon, visibility very good, wind W-SW F1-3, temp 0-6C
07/03/2016	JNM	14	10.00	13.00	3	Cloud cover 5/8, sunny spells, dry, cool, visibility excellent, wind N-NE F3-4, showers at 12.10pm, temp 6-7C
07/03/2016	JNM	15	13.15	16.15	3	Wind N-NW F3-4, temp 9C
09/03/2016	H.T	6	15.00	18.00	3	Cool, sunny day with occasional showers, visibility very good, wind N-NW F2-4, temp 7-9C
09/03/2016	JNM	7	15.00	18.00	3	Cool, sunny day with occasional shower, visibility excellent, wind N-NW F2-4, temp 7-9C
10/03/2016	JNM	6	9.30	12.30	3	Dry, mild, calm day, cloud cover 6/8, visibility good, wind S-SW F1-2 veering W, temp 9C
10/03/2016	H.T	7	9.30	12.30	3	Dry, mild day, calm, cloud cover 6/8, visibility good, wind S-SW F1-2, temp 9C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
11/03/2016	JNM	14	13.30	16.30	3	Cloud cover 7/8, dull, dry warm afternoon, visibility good, wind W-NW F1-4, temp 14C
11/03/2016	JNM	15	9.00	12.00	3	Dull, overcast, cool morning, cloud cover 8/8, visibility good, wind W-NW F2-4, temp 9-10C
14/03/2016	C.L	11	9.10	12.20	3	Dry, light breeze, sunny, cloud 1/8, wind ESE F1-2, temp 6-11C
14/03/2016	C.L	13	13.25	16.25	3	Dry, sunny, light breeze, cloud cover 8/8 eventually fog, wind ESE F2, temp 11-12C
15/03/2016	JNM	8	9.30	12.30	3	Dry, fine sunny day, cloud cover 1/8 increasing to 5/8, visibility excellent, wind SE-E F1-3, temp 9C
15/03/2016	JNM	12	13.00	16.00	3	Dry, sunny, warm, cloud cover 6/8, visibility excellent, wind SE F1-3, temp 13-15C
16/03/2016	JNM	8	10.30	13.30	3	Fine sunny day, visibility excellent, wind NE-E F1-2, temp 10-14C
16/03/2016	A.C.	9	9.00	12.00	3	Cloud cover 8/8 to 4/8, sunshine from 10.10am, visibility good, wind E F1-2, temp 8-12C
16/03/2016	A.C.	10	13.30	16.30	3	Cloud cover 3/8, sunshine, visibility good, wind E F1-2, temp 12-14C
16/03/2016	JNM	12	10.30	13.30	3	Fine, dry, mild sunny morning, cloud cover 4/8, visibility excellent, wind NE-E F1-2, temp 10C
18/03/2016	C.L	11	13.00	16.00	3	Dry, sunny, cloud 1/8, haze on horizon, wind ENE F1-2, temp 6-10C
18/03/2016	C.L	13	9.00	12.00	3	Foggy, cloud cover 8/8, visibility poor, temp -1-4C
23/03/2016	JNM	5	13.15	16.15	3	Damp, wet, overcast, visibility moderate, wind W F1-4, temp 9-10C
24/03/2016	JNM	4	10.00	13.00	3	Wet, damp morning clearing by mid-morning, visibility moderate, wind W F1-4, misty rain at 12.10pm, temp 10-12C
25/03/2016	A.C.	9	12.25	15.25	3	Cloud cover 8/8, hazy sunshine, visibility good, wind S F3-4, temp 12-13C
25/03/2016	A.C.	10	9.00	12.00	3	Cloud cover 7/8, hazy sunshine, visibility good, wind S F1-2 gusting to F3-4, temp 8-13C
29/03/2016	H.T	4	15.30	18.30	3	Dry, sunny spells, some light showers, visibility good, wind SW-W F1-4, temp 6C
29/03/2016	JNM	5	15.30	18.30	3	Plenty of dry sunny spells with showers in late afternoon, visibility good, wind SW-W F1-4, temp 8-12C
30/03/2016	JNM	1	9.30	12.30	3	Dry sunny morning with some light showers, visibility very good, wind SW-W-NW F1-4, temp 6C
30/03/2016	H.T	1	14.30	17.30	3	Sunny, breezy, showers, visibility good, wind NW F2-4, temp 7-9C
30/03/2016	H.T	2	9.30	12.30	3	Sunny, cool, breezy, visibility good, wind F3-4, temp 6C
30/03/2016	JNM	2	14.30	17.30	3	Bright afternoon with some showers, visibility good, wind NW F1-4, temp 6-8C

Date	Observer	VP	Start Time	Finish Time	Length of VP watch (hrs)	Weather
31/03/2016	H.T	3	9.30	12.30	3	Cool at start, dry, sunny spells, visibility good, wind F2-3, temp 9-10C
31/03/2016	A.C.	3	14.15	17.15	3	Cloud cover 7/8, intermittent sunshine, visibility good, wind SW gusting F2-3, temp 11C

Appendix 3

Transect Survey Summary Table

Date	Observer	Transect No.	Start Time	Finish Time	Weather
17/11/2015	J.A.	1	13.00	13.35	Dull, overcast, misty rain, visibility poor to fair, wind SW F5-6, temp 8-9C
17/11/2015	J.A.	3	9.30	9.40	Dull overcast, bluster, visibility poor to fair, wind SW F5-6, temp 5-6C
18/11/2015	J.A.	2	9.30	10.10	Heavy showers at times, visibility good, wind SW F5, temp 6-7C
19/11/2015	JNM	4	10.30	11.00	Showers and sunny spells, visibility good, wind W-NW F2-3, temp 8C
19/11/2015	JNM	5	11.25	12.00	Showers on and off, visibility good, wind W-NW F2-3, temp 8C
19/11/2015	JNM	6	10.35	11.10	Dry, calm, slack westerly wind, temp 9C
19/11/2015	JNM	7	9.45	10.20	Dry, calm, slack westerly wind, temp 9C
19/11/2015	JNM	8	9.00	9.30	Dry, calm, slack westerly wind, temp 10C
19/11/2015	JNM	9	14.15	14.45	Dry, sunny spells, occasional shower, visibility good, wind W-NW F4-5, temp 8C
19/11/2015	JNM	10	13.30	14.00	Dry, sunny spells, visibility good, wind W-NW F4-5, temp 8C
19/11/2015	JNM	12	14.55	15.30	Dry, calm, slack westerly wind, temp 10C
19/11/2015	A.C.	13	8.30	9.05	Dry, calm, slack westerly wind, temp 10C
20/11/2015	A.C.	11	8.40	9.10	Cloud cover 6/8, rain showers with intermittent sunshine, visibility good, wind W F1-3, temp 4-10C
24/11/2015	JNM	14	16.45	17.15	Cloud cover 8/8, rain, visibility poor, wind NW F1-3, temp 10C
24/11/2015	A.C.	15	16.50	17.25	Cloud cover 8/8, rain, visibility poor, wind NW F1-3, temp 10C
14/03/2016	C.L.	11	12.33	13.00	Dry, sunny, light breeze, cloud cover 1/8, wind ESE F1-2, temp 12C
16/03/2016	A.C.	15	16.40	17.13	Cloud cover 5/8, sunshine, visibility good, wind E F1-2, temp 12C
18/03/2016	C.L.	13	16.20	17.15	Dry, sunny, light breeze, cloud cover 1/8, wind F1, temp 9C
25/03/2016	A.C.	14	15.45	16.23	Cloud cover 8/8, visibility good, gusty, wind S F3-4, temp 12C
29/03/2016	JNM & HT	3	14.30	15.10	Visibility moderate, wind W-SW F1-4, temp 6-7C
29/03/2016	JNM & HT	7	13.45	14.20	Visibility moderate, wind W-SW F1-4, temp 6-7C
29/03/2016	JNM & HT	8	10.45	11.30	Visibility good, wind W F2-5, temp 6-9C
29/03/2016	JNM & HT	12	12.45	13.15	Heavy showers followed by sunshine, visibility moderate, wind W F2-5, temp 4-6C
30/03/2016	JNM & HT	9	18.30	19.00	Dry, odd shower, wind SW-W-NW F2-4, temp 9-10C
30/03/2016	JNM & HT	10	17.50	18.20	Dry, sunny, odd shower, wind SW-W-NW F2-4, temp 9-10C
31/03/2016	A.C.	1	11.25	12.05	Cloud cover 2/8, sunshine, visibility good, wind SW F1-2, temp 8C
31/03/2016	A.C.	2	13.22	13.59	Cloud cover 4/8, sunshine, visibility good, wind SW F1-2, temp 10-11C
31/03/2016	JNM	4	13.30	14.10	Fine sunny day, visibility excellent, wind N F1-3, temp 10C
31/03/2016	A.C.	5	10.05	10.43	Clear sky, sunshine, visibility good, wind SW F1-2, temp 7-8C
31/03/2016	JNM	6	11.25	12.05	Fine dry, cool, sunny morning, visibility excellent, wind N F2-3, temp 8C

Appendix 4

Vantage Point Survey Results Summary Tables

Black-headed Gull												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
29/03/2016	5	Unknown	Adult	3	River/woodland	1	4.37	Three birds were observed to the north of the VP flying over the River Shannon from the north-east heading in a south-westerly direction	0	0	15	0
									0	0	15	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
09/09/2015	6	Unknown	Adult	1	Deciduous woodland	1	12.50	A buzzard was first heard calling as it was being mobbed by swallows. The adult flew south-east at first and then north, well above the tree-tops at c.20-25m, travelling at a leisurely pace	0	0	240	0
10/09/2015	14	Unknown	Adult	2	Peat bog, woodland	2	09.41	Two adults observed flying from the west in an easterly direction over bog (80 seconds) and woodland (30 seconds), at a height of approximately 50m. Birds then went out of view behind tree-line	0	0	110	0
10/09/2015	5	Unknown	Adult	1	Edge of cutover	3a	15.04	An adult was observed flying low along a dyke and tree-line to the north-east of the VP for 45 seconds. It flew towards the south-west of site, to the south of the VP, upon seeing the surveyor, towards an area of birch at	0	45	0	0
10/09/2015	5	Unknown	Adult	1	Tree-line	3b	15.11	Presumably the same individual observed flying along the edge of a poplar tree-line	0	45	0	0

Buzzard													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
15/09/2015	14	Unknown	Adult	3	Peat bog, woodland	4	14.38	Three adults observed soaring at height of 150m above bog for 300 seconds before moving in a southerly direction. Birds then soared in a easterly direction over woodland, for 60 seconds, before going out of view behind tree-line	0	0	0	360	
16/09/2015	13	Unknown	Adult	3	Woodland	5a	13.57	Three adult birds observed south-east of VP, soaring outside site boundary at an approximate height of 200m. Birds were in view for 60 seconds before going out of sight behind tree-line	0	0	0	60	
16/09/2015	13	Unknown	Unknown	6	Woodland	5b	14.51	Six birds observed for 140 seconds soaring north-west of VP, outside the site boundary . Birds were observed over woodland at an approximate height of 250+m. Birds went out of view, soaring in a westerly direction	0	0	0	140	
18/09/2015	11	Unknown	Adult	1	Woodland	6a	13.01	One adult bird observed soaring in an easterly direction, north-east of the VP and outside of the site boundary . Bird observed soaring for 60 seconds at approximately 250m altitude, before going out of view behind a tree-line	0	0	0	60	
18/09/2015	11	Unknown	Adult	2	Woodland	6b	13.29	Two adult birds observed soaring north-west of the VP, outside the site boundary . Birds in view for approx. 180 seconds, at a height of roughly 250m before going out of view behind a tree-line	0	0	0	180	

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
24/09/2015	1	Unknown	Adult	1	Cutover/raised bog	7	12.52	An adult was observed to the south-west of the VP. It soared across the road and then flew in a south-easterly direction parallel to the road, before flying south, at c. 20-40m	0	0	125	0
06/10/2015	14	Unknown	Adult	3	Woodland	8a	13.51	Three adult birds observed south of VP soaring at a height in excess of 200m. All three birds were observed soaring in a similar pattern	0	0	0	240
06/10/2015	14	Unknown	Adult	3	Woodland	8b	14.45	Three birds observed soaring east of VP over woodland. Birds observed for 120 seconds at >100m above ground. These three birds were possibly the same three as seen earlier in the day	0	0	0	120
09/10/2015	14	Unknown	Unknown	1	Woodland	9	11.50	One bird observed flying in a westerly direction north of the VP. The bird was flying at approximately 80m height before going out of sight behind a tree-line	0	0	120	0
16/10/2015	11	Unknown	Adult	1	Woodland	10	13.07	Adult observed flying in a southerly direction north-west of VP. Bird was observed over woodland, continuing in a southerly direction before going out of view	0	0	0	360
29/10/2015	15	Unknown	Unknown	1	Farmland	11	12.56	A bird was observed soaring high on thermals, drifting from the south eventually heading in a westerly direction. It was harassed by rooks and jackdaws. Bird was outside site boundary	0	0	0	240
08/12/2015	11	Unknown	Adult	1	Woodland	12	10.10	Adult observed soaring north-west of VP in a westerly direction. Bird was outside the site boundary. Moved out of view behind tree-line	0	0	25	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
08/12/2015	5	Unknown	Adult	1	Edge of cutover	13	11.10	An adult flew to the south of the VP, heading from west to east, casually commuting at edge of cutover bog	0	0	5	0
06/01/2016	14	Unknown	Juvenile	1	Improved grassland	14	10.25	A juvenile buzzard was observed sitting on the ground in an improved field, to the east of the VP and outside of the site boundary	10,800	0	0	0
07/01/2016	15	Unknown	Adult	1	Bog woodland	15	10.12	An adult was observed hunting above the tree-line to the south-east of the site. It flew at a height of 3-4m	0	60	0	0
14/01/2016	6	Unknown	Adult	1	Conifer, open bog	16a	14.18	An adult was observed perched on a pole in an area of conifer near VP6 for 30 minutes during a snow shower. The bird then flew low, 3-5m over bog, towards farmland in the north-west, landing on a pole. Total observation time was 1,860 seconds. Total flight time was 60 seconds at <10m height	1,800	60	0	0
14/01/2016	6	Unknown	Adult	1	Peat bog	16b	14.45	The same bird flew from the pole back across the site in an east-south-easterly direction at approximately 8m above the ground	0	60	0	0
15/01/2016	13	Unknown	Unknown	1	Woodland	17	15.08	Bird observed flying in westerly direction south of the VP. Bird flew along tree-line before going out of view	0	6	0	0
26/01/2016	1	Unknown	Unknown	1	Unknown	18	-	Buzzard observed soaring east of the VP, outside the site boundary . Bird was approx. 250m high	0	0	0	30
03/02/2016	14	Unknown	Adult	1	Edge of cutover, farmland	19	15.09	An adult was observed soaring for approx. 3 min at height of 30-40m in the south-east corner of site where the bog meets farmland. The bird called continuously as it drifted off to the east	0	0	180	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
11/02/2016	5	Unknown	Adult	1	Gorse scrub	20a	13.05	An adult bird was observed perched on a power line pole immediately to the east of the VP. After 12 minutes the bird flew off in a north-easterly direction (at 13.17pm). It was in view for 5 seconds (20m above ground) before going out of view behind trees	720	0	5	0
11/02/2016	5	Unknown	Adult	1	Gorse scrub	20b	13.52	Adult observed perched on power line pole south-east of VP for approx. 65 minutes. Unable to determine time or direction bird flew off in as view obscured by trees	3,900	0	0	0
18/02/2016	9	Unknown	Unknown	1	Open cutaway bog	21	10.52	A buzzard was observed south of the VP, soaring at approx. 20-25m height, over open bog before drifting off to the south of the site	0	0	60	0
19/02/2016	-	Unknown	Unknown	1	Bog	22	-	One buzzard was seen near VP13 as the surveyor travelled through the bog en-route to VP11				
24/02/2016	2	Unknown	Adult	1	Woodland	23	11.30	One adult observed south-west of VP, soaring in an easterly direction, outside site boundary	0	0	0	120
07/03/2016	15	Unknown	Adult	1	Farmland, peatland	24	13.30	Buzzard observed off-site , to SE of VP, approx 4-5km away. Soaring and displaying approx 100-150m high over farmland and bog adjacent to canal	0	0	0	30
10/03/2016	6	Unknown	Unknown	1	Open bog, tree line	25	11.35	Buzzard soared around in circles for approx. 90 seconds to NW of VP, generally heading from W to E, at a height of 10-15m, before drifting out of sight in the N section of the bog. Bird re-appeared at 11.43am sitting on top of a tall conifer in the NE of the site as marked on map. Bird flew off to the E at 12.30pm	2,820	0	90	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
10/03/2016	7	Unknown	Unknown	1	Unknown	26a	12.05	Buzzard seen soaring high in circles outside site boundary	0	0	0	40
10/03/2016	7	Unknown	Unknown	1	Unknown	26b	12.20	Presumably the same bird seen again, soaring northeast of VP, at c.300m, outside site boundary	0	0	0	120
14/03/2016	11	Unknown	Unknown	1	Cutover bog	27a	9.57	Buzzard harassed by hooded crows flew low over cutover bog heading in south-easterly direction	0	50	0	0
14/03/2016	11	Unknown	Unknown	2	Improved grassland/cutover	27b	11.23	Two birds seen soaring NE of VP at between 10-100m height for 30 seconds	0	0	30	0
14/03/2016	11	Unknown	Unknown	2	Improved grassland/cutover	27c	11.37	Two birds, presumably the same two as above, observed NE of VP generally heading in a southerly direction	0	0	120	180
14/03/2016	13	Unknown	Unknown	1	Cutover bog/woodland	28a	13.35	Seen SE of VP, flying low over trees and disappeared from sight	0	0	120	0
14/03/2016	13	Unknown	Unknown	1	Cutover bog/woodland	28b	13.45	Seen soaring south east of VP	0	0	300	0
14/03/2016	13	Unknown	Unknown	3	Cutover bog/woodland	28c	14.08	Three birds seen soaring south-east of VP	0	0	480	300
14/03/2016	13	Unknown	Unknown	1	Cutover bog/woodland	28d	14.40	Seen soaring south-east of VP for approx. 60 seconds at 10-100m height	0	0	60	0
14/03/2016	13	Unknown	Unknown	2	Cutover bog/woodland	28e	15.27	Seen soaring and probable courtship displays, south of VP	0	0	240	0
14/03/2016	13	Unknown	Unknown	1	Cutover bog/woodland	28f	15.28	Observed south of VP at <10m height	0	5	0	0
14/03/2016	13	Unknown	Unknown	2	Cutover bog/woodland	28g	16.21	Two birds observed flying and soaring south-east of VP at 10-100m height	0	0	240	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
15/03/2016	8	Unknown	Unknown	1	Farmland/ cutover/ woodland	29a	10.30	A buzzard was first observed soaring low over farmland to the east of the VP at a height of approximately 15m, before it started climbing to a height of 20-30m. It drifted off to the south of the site slowly before heading over woodland to the south	0	0	240	0
15/03/2016	8	Unknown	Unknown	3	Peat bog/scrub	29b	11.30	One buzzard flew over site followed by two more. Two birds soared between 12-18m, south of VP and above VP, joined by a third bird at 11.35 before all three drifted off to the west	0	0	360	0
16/03/2016	8	Unknown	Unknown	2	Open bog/farmland	30	15.25	A pair of buzzards soared in over the site NE of VP and towards the SW. They were high up at 40-50 metres. They slowly moved in a SW direction before dropping down out of sight in farmland trees	0	0	240	0
16/03/2016	9	Unknown	Unknown	2	Woodland	31	10.54	Birds observed soaring outside site boundary 2km south east of VP	0	0	0	30
18/03/2016	13	Unknown	Unknown	2	Cutover bog/woodland	32a	11.22	Two buzzards flew low over trees south of VP before disappearing from sight. Possibly perched in trees	0	10	60	0
18/03/2016	13	Unknown	Unknown	2	Bog woodland/ cutover	32b	11.33	Two buzzards observed to the south east of the VP at the edge of the site. Flew low before gaining height and soaring	0	2	720	0
18/03/2016	13	Unknown	Unknown	2	Bog woodland/ cutover	32c	11.53	Two buzzards observed soaring to the south east of the VP at the eastern margin of the site	0	0	60	0
18/03/2016	11	Unknown	Unknown	4	Bog woodland/ cutover/ improved grassland	33	13.10	Four birds observed soaring along the western border of the southern end of site. Had heard buzzards calling at 13.03pm, presumably the same birds	0	0	360	0

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
25/03/2016	10	Unknown	Unknown	1	Bog	34a	11.54	Bird observed flying over bog being chased by a raven. Bird was in view for 12 seconds before going out of view behind tree line. Bird was flying in a SW direction at 85-100m, then NE direction	0	0	12	0
25/03/2016	10	Unknown	Unknown	2		34b	11.42	Two buzzards observed soaring SE of VP above tree line outside of site boundary	0	0	0	480
29/03/2016	4	Unknown	Adult	1	Cutover bog/railway line	35	16.05	Adult buzzard flew across the SW corner of the site at a height of 30m, heading in a south-easterly direction	0	0	70	0
29/03/2016	5	Unknown	Unknown	1	Tree-line/river/woodland	36	16.16	Soared over the site from over a tree line to the SW at height of 10m before circling and drifting off towards the Shannon River, rising to a height of 50-80m. It was observed continuously, soaring for 24 minutes, hovering occasionally, before slowly moving in a SW direction. Bird was outside site boundary	0	60	1,380	0
30/03/2016	1	Unknown	Unknown	2	Farmland	37	11.15	Two buzzards were soaring over farmland SE of the site about 3-5km away. Birds were outside site boundary	0	0	0	420
30/03/2016	2	Unknown	Unknown	1	Scrub/woodland	38	11.04	Buzzard was observed due E of VP. Circling and soaring generally heading N to S	0	0	0	40
31/03/2016	3	Unknown	Unknown	1	Farmland/road way	39a	10.58	Buzzard soaring very high to NW of VP. Bird was outside site boundary	0	0	0	120

Buzzard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
31/03/2016	3	Unknown	Unknown	2	Farmland/ roadway/ cutover	39b	12.00	Two buzzards first observed off site to SW of VP soaring (approximately 50m high). Flying quite close to each other, within a couple of metres. Slowly moved together north-eastwards along western edge of site increasing to approximately 150m height. Pair then veered eastwards, gaining height, circling high in the sky (approximately 300m. Birds then drifted over the site until out of view. Possibly pair as birds are interacting with each other. Time observed (90 seconds at 10-100m while off-site , 330 seconds at >100m on-site)	0	0	90	330
31/03/2016	3	Unknown	Unknown	2	Unknown	39c	-	Two buzzards observed soaring NW of VP outside site boundary . Birds in view for 24 seconds before going out of view	0	0	0	0
									20,040	403	6,142	4,000

Cormorant												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
26/01/2016	1	Unknown	Adult	1	Peat bog	1	10.18	An adult was observed commuting in a north-westerly direction to the east of the VP. It was in view for 60 sec before dropping behind a tree-line.	0	0	60	0

Cormorant												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
24/02/2016	1	Unknown	Unknown	1	Woodland	2	15.18	A cormorant was observed flying in a southerly direction east of the VP. Bird was commuting over woodland at 40-50m height was in view for 15 seconds before disappearing from view	0	0	15	0
25/02/2016	3	Unknown	Adult	1	River	3	15.28	One adult came into view to the east of the VP. Bird was commuting in a southerly direction before crossing site boundary and going out of view	0	0	40	0
30/03/2016	1	Unknown	Unknown	1	Cutover bog/railway line	4	17.19	Cormorant observed north of VP heading in a south-easterly direction	0	0	40	0
30/03/2016	2	Unknown	Unknown	1	Cutover/tree line/ scrub	5	11.14	Cormorant observed due east of VP heading in a southerly direction	0	0	40	0
31/03/2016	3	Unknown	Unknown	1	Water	6	16.01	Cormorant observed flying in a southerly direction, 40m above water. It remained in view for 35 seconds before going out of view behind tree line	0	0	35	0
									0	0	230	0

Curlew												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
13/10/2015	12	Unknown	Unknown	1	Unknown	1	9.15	One bird heard calling south-east of VP. The bird was not observed due to fog and dense vegetation cover	n/a	n/a	n/a	n/a

Golden Plover												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
06/10/2015	15	Unknown	Adult	4	Peat bog	1	9.55	Four adult birds observed standing on bog (three birds south-west of VP, outside of site boundary and one bird north-west of VP, within site boundary). Birds observed until end of VP watch	7,500	0	0	0
22/10/2015	7	Unknown	Unknown	21	Peat bog	2	10.58	Flock observed sitting on bog, just to the north-west of the VP. Birds remained at the same location until end of watch	6,420	0	0	0
29/10/2015	15	Unknown	Unknown	4	Peat bog	3	12.10	Birds observed sitting on the bog to the north of the VP before disappearing from view	7,200	0	0	0
29/10/2015	14	Unknown	Unknown	3	Peat bog	4	9.00	Birds observed feeding on open peat bog south-west of the VP for the duration of the survey	10,800	0	0	0
11/11/2015	7	Unknown	Unknown	2	Peat bog	5	10.30	Birds fed on bare peat in the south of the site throughout the VP survey period	10,800	0	0	0
02/12/2015	12	Unknown	Unknown	1	Cutover peat/standing water	6	12.34	Bird flew onto the site from the south. It landed and began to feed at the edge of the flooded area in the middle of the bog. Poor visibility meant that time of departure or flight direction was not determined	60	0	0	0
03/12/2015	7	Unknown	Unknown	1	Standing water	7	09.30	Bird observed feeding on a waterlogged area directly north of the VP for the duration of the watch. Water levels were noted to have dropped dramatically overnight	10,800	0	0	0
07/12/2015	4	Unknown	Adult	63	Cutover bog	8a	09.30	On arrival a tight flock observed to the west of the VP flying south over cutover at c.30m height	0	0	10	0
07/12/2015	4	Unknown	Adult	10	Cutover bog	8b	11.19	Flock observed circling over cutover to the north-west of VP at c.40m height before disappearing onto bog to the NW	0	0	25	0

Golden Plover													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
08/12/2015	11	Unknown	Unknown	6	Peat bog	9	10.47	Birds observed sitting on bog before flying off. It was not possible to determine flight direction due to a heavy rain shower and poor visibility	480	0	0	0	
16/12/2015	1	Unknown	Unknown	4	Standing water	10	14.42	Birds observed feeding on a flooded area of the bog. They remained for the duration of the survey time	3,780	0	0	0	
06/01/2016	14	Unknown	Unknown	135	Unknown	11	11.50	Flock of c.135 observed flying in a V-shape formation at 300-400m height above ground, to the north-west of the site, outside the site boundary . The flock headed in a south-westerly direction towards Lough Ree. These birds were at least 4-5km away, close to Lanesborough	0	0	0	180	
08/01/2016	12	Unknown	Adult	2	Peat bog	12	13.45	Birds observed feeding on a peat mound in the middle of the bog, directly east of the VP. Present for the remainder of the watch	9,900	0	0	0	
22/01/2016	10	Unknown	Unknown	11	Cutover bog/ farmland	13a	10.48	Birds commuting from SE-NW, over cutover bog and across farmland at a height of approx. 18-20m	0	0	120	0	
22/01/2016	10	Unknown	Unknown	11	Cutover bog	13b	11.15	The same flock reappeared sitting on the bog where they remained for the rest of the watch	9,600	0	0	0	
26/01/2016	1	Unknown	Unknown	28	Cutover bog/ standing water	14	15.55	A shooter with a dog flushed flock from bog to the edge of a flooded area to the north-east of the VP. They flew a short distance of c.100m at a height of 2-3m before landing	1,200	60	0	0	
27/01/2016	3	Unknown	Adult	6	Cutover bog/ bog pools	15	14.30	Birds observed sitting on open peat bog to the north of the VP near a railway crossing. Birds were seen to be roosting and feeding in wet flash pools for the remainder of the VP	7,200	0	0	0	
09/03/2016	7	Unknown	Unknown	90	Unknown	16		Flock of 90+ golden plover seen east of VP, outside of site boundary	0	0	30	0	

Golden Plover												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
25/03/2016	10	Unknown	Adult	20	Peat bog	17	09.00	Flock observed sitting on the bog for the duration of the watch	10,800	0	0	0
30/03/2016	1	Unknown	Adult	500	Standing water/ peat bog	18a	11.02	Flock (500+) flew into the site from a SW direction (descending from approx. 200m height). They landed on the edge of a large flooded area to the E/NE of VP. Flock remained on the ground for period before flying off in a SE direction, towards farmland	900	8	20	40
30/03/2016	1	Unknown	Adult	500	Unknown	18b	16.32	Flock of 500+ observed outside of site boundary over the River Shannon. Approximately 250-300m height. Smaller flock (350+) dropped down to 60-100m, beyond tree line, out of view. Outside site boundary	0	0	120	2,100
30/03/2016	2	Unknown	Unknown	500	River	19		Large flock (500+) observed way off-site for approximately 30 minutes due E of VP near River Shannon. Approximately 200-250m height	0	0	0	1,800
31/03/2016	3	Unknown	Unknown	-	Unknown	20a	11.44	Two flocks flew approximately 100m in height beyond eastern edge of site. Landed beyond tree line near River Shannon. Birds outside site boundary	0	0	100	0
31/03/2016	3	Unknown	Unknown	15	Cutover bog	20b	11.55	Flock flew from behind tree line at E edge of site heading in W direction, over open cutover peat, before landing in NW corner of site. Sitting on milled peat for remainder of VP. Larger flock (approx. 300 birds) observed way off-site near Shannon	2,065	5	30	0
31/03/2016	3	Unknown	Unknown	500	Unknown	20c	-	500+ flock observed east of VP, approx. 3km away and outside site boundary	0	0	0	30
									99,505	73	455	4,150

Greenland White-fronted goose												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
11/11/2015	7	Unknown	Adults	3	Peat bog	1	10.30	Three birds fed in drains and wet flush in open bog for the duration of the VP survey period	10,800	0	0	0
									10,800	0	0	0

Grey Heron												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
14/10/2015	2	Unknown	Adult	1	Raised bog/cutover/willow and birch woodland	1	10.59	Heron observed flying from the north-east first over bog followed by an area of willow/birch woodland at approx. 10-15m height, heading in a westerly direction and calling continuously	0	0	50	0
15/10/2015	11	Unknown	Adult	1	Peat bog	2	11.36	Adult observed flying in a southerly direction over bog at an approximate height of 10m before disappearing out of sight behind trees	0	3	0	0
14/12/2015	3	Unknown	Unknown	2	Lowland river	3	-	Birds seen flying up the River Shannon at Lanesborough outside of the site boundary	0	0	30	0
19/01/2016	6	Unknown	Unknown	1	Unknown	4	13.08	Bird observed commuting over the south of the site heading in an easterly direction. Flying at 18-20m height	0	0	120	0
12/02/2016	4	Unknown	Unknown	1	Bog	5	15.12	Bird observed commuting just to the north of the VP, heading from west to east over cutaway bog. Bird was flying at a height of 15m	0	0	6	0
30/03/2016	1	Unknown	Adult	1	Standing water	6	09.30	Bird spent the whole of the VP watch feeding in small ponds and drains, adjacent to roadside, in front of VP	10,800	0	0	0
30/03/2016	2	Unknown	Adult	1	Cutover/scrub	7	09.45	Bird flew from S of VP heading NE before veering westwards. Flew at approximately 60m height	0	0	120	0

Grey Heron													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
31/03/2016	3	Unknown	Adult	1	Unknown	8	11.55	Heron flew along W edge of site before veering in a NE direction. Approximately 15m in height. Bird was outside site boundary	0	0	30	0	
									10,800	0	350	0	

Greylag Goose													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
19/01/2016	6	Unknown	Adult	1	Cutover bog/ standing water	1	10.30	Bird observed on the ground for the duration of the VP, foraging and resting towards the northern part of the site in a wet area of bog	10,800	0	0	0	
									10,800	0	0	0	

Hen Harrier													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
24/09/2015	1	Unknown	Juvenile	1	Depleted raised bog/ willow scrub	1	13.02	Bird first observed to the south-west of the VP foraging low over the ground (1-2m). It flew along west of the VP heading in a north-easterly direction before disappearing into a stand of rushes	0	45	0	0	

Hen Harrier												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
03/12/2015	12	Female	Adult	1	Cutover bog	2	14.02	Female flew in over the VP from the north at a height of 10m. The bird glided over the open peat bog and turned as it dropped down to 5m above the ground. The bird then flew over the track that leads down to the bog and off over the trees to the south-west of the site. The bird appeared to be hunting although heavy rain affected visibility	0	60	0	0
16/12/2015	1	Unknown	Juvenile	1	Open bog/ edge of flooded area	3	13.10	An immature bird hunted over vegetation in the middle of the site, to the east of VP, at a height of 2m, occasionally dropping lower	0	240	0	0
20/01/2016	5	Male	Unknown	1	Cutover bog and bog edge/ rough grassland	4	15.17	Male hen harrier flew over bog and rough pasture, at a height of approx. 2-4m, hunting at the edge of the cutover bog/vegetated fringe of the bog. Flew over tree-line as he went out of view	0	60	0	0
26/01/2016	1	Unknown	Juvenile	1	Road/ tree line at edge of bog	5	13.55	A wing-tagged bird flew into the site across the railway line and along the road to the west of the VP where it was harassed by a kestrel. As it was being chased it flew at between 2-5m height. The kestrel disappeared behind a tree line and the hen harrier continued hunting	0	120	0	0
26/01/2016	2	Female	Adult	1	Woodland	6	15.51	An adult female was observed flying in a westerly direction north of VP. Bird flew west across railway line at 4m height, then south amongst trees and then veered west again before going out of view	0	60	0	0

Hen Harrier													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
									0	585	0	0	

Kestrel													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
10/09/2015	14	Female	Adult	1	Peat bog	1	10.48	Female adult observed hovering over patch of gorse, north of VP, at an approximate height of 30m above ground	0	0	70	0	
15/09/2015	15	Female	Adult	1	Scrub	2	11.16	Female adult perched on peat mound for 360 seconds preening. Then flew west for approximately 100m into scrub and out of view	360	0	20	0	
16/09/2015	11	Female	Unknown	1	Peat bog	3	10.12	Female bird observed flying low over bog along a peat mound east of the VP. Observed for 4 seconds before going out of view behind the mound	0	4	0	0	
16/09/2015	13	Female	Adult	1	Peat bog	4	12.29	Female adult observed perched on ESB pole south-east of VP. Bird observed for 240 seconds before flying low over the bog in a westerly direction into area of scrub	240	20	0	0	
17/09/2015	12	Female	Adult	1	Woodland/scrub	5	10.41	Adult female observed hovering over woodland/scrub south-east of VP, at an approximate height of 50m. Bird observed for 20 seconds before dropping out of view into wooded area	0	0	20	0	
18/09/2015	13	Female	Adult	1	Peat bog	6	10.31	Adult female observed perched on ESB pole south-east of VP before flying in a south westerly direction over the bog into a corner of scrub	20	100	0	0	

Kestrel												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
06/10/2015	15	Female	Adult	1	Scrub	7	09.50	Female adult observed south of VP perched and preening. Bird was perched for 30 minutes before dropping out of view into scrub	1,800	0	0	0
12/10/2015	4	Male	Adult	1	Cutover bog/ deciduous woodland	8	14.20	A male kestrel was observed to the south-west of the VP, flying in an easterly direction before veering northwards. It hunted over cutover bog followed by deciduous woodland	0	0	35	0
12/10/2015	5	Male	Adult	1	Farmland	9	15.43	An adult male was observed hunting over farmland immediately to the east of the VP. It flew eastwards at approx. 25m height	0	0	45	0
13/10/2015	2	Pair	Adult	2	Unknown	10	12.33	A pair of kestrels were observed flying into site from different directions (one from north-east of VP and one from south-west of VP) at approx. 10-20m height before both flying off together in a south-easterly direction	0	0	40	0
13/10/2015	13	Male	Adult	1	Peat bog	11	13.21	Adult male observed perched on ESB pole before flying west over the bog and into area of scrub where it disappeared from view	20	4	0	0
14/10/2015	4	Male	Unknown	1	Cutover bog/ willow scrub	12	14.33	A male kestrel was observed hunting to the north of the VP. It hunted over cutover bog before moving over willow scrub at approx. 25m height. Same hunting pattern as birds observed at this location during winter 2014/15	0	0	145	0
15/10/2015	10	Female	Unknown	1	Peat bog	13	12.30	Female observed perched on peat mound preening before dropping out of view behind mound	240	0	0	0
19/10/2015	9	Female	Unknown	1	Peat bog	14	09.36	Female bird observed perched on peat mound before dropping out of view	720	0	0	0

Kestrel												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
20/10/2015	8	Female	Unknown	1	Scrub/gorse	15	10.01	Female observed perched on ESB pole, outside site boundary. Bird dropped out of view into area of scrub	270	0	0	0
22/10/2015	7	Female	Unknown	1	Peat bog	16	10.00	Female observed flying in a north-west direction 3m above the bog before going out of view behind hedgerow	0	6	0	0
23/10/2015	6	Female	Unknown	1	Gorse scrub	17	09.36	Female observed hovering above area of gorse at approximately 50-60m above ground. Bird was observed moving in a westerly direction before dropping out of view into gorse	0	0	90	0
28/10/2015	15	Female	Juvenile	1	Cutaway bog	18	13.01	An immature female flew into the site from the west at <10m above ground. It hovered as it travelled through the site, before dropping to the ground and disappearing. It then reappeared and flew east at a height of 2-3m above ground, over farmland to the east of the site	0	180	0	0
28/10/2015	14	Male	Adult	1	Peat bog/farmland	19	13.50	One adult male flew from farmland to the south-east between 6-8m above the ground before hovering over bare peat near the train-line crossing. It then flew off north at the same height, hovering occasionally, over rough ground at the edge of the bog before flying off towards farmland to the east of the site	0	300	0	0
29/10/2015	15	Unknown	Unknown	1	Bog boundary with farmland	20	14.20	A bird was observed moving south slowly, hunting. It maintained a height of approximately 80m as it hovered, slowing looking to the ground for prey. It then flew off east	0	0	300	0

Kestrel												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
04/11/2015	8	Male	Unknown	1	Bog boundary with farmland	21	11.36	One male bird flew along a hedgerow at the boundary between bog and farmland, approximately 2m above ground, heading in a southerly direction	0	60	0	0
11/11/2015	6	Female	Adult	1	Bog boundary with farmland	22	14.20	An adult female was observed flying along a hedgerow at the edge of the bog where it meets farmland. The bird flew southwards at a height of 8-10m as it drifted over the hedge and tree-line	0	120	0	0
18/11/2015	10	Male	Adult	1	Cutaway bog	23	11.53	An adult male flew west over the south of the bog, hunting at a height of 2-3m. On three occasions he was grounded by the strong winds before eventually flying off west towards the tree-line in the distance	0	120	0	0
24/11/2015	5	Unknown	Unknown	1	Boundary between spruce plantation and cutaway	24	11.55	A bird was seen hovering to the north of the site where cutaway bog meets a spruce plantation before disappearing over the trees	0	0	180	0
04/12/2015	10	Female	Adult	1	Peat bog	25	11.49	An adult female was observed hovering over bog south-west of the VP. The bird dropped out of view behind a peat mound	0	0	40	0
16/12/2015	1	Female	Unknown	1	Edge of open bog	26	13.45	A female was observed hunting, hovering high over the edge of the bog, before heading north to hunt further up the bog	0	0	300	0
06/01/2016	15	Female	Juvenile	1	Farmland	27	13.53	An immature female was observed hunting over farmland to the west of the VP. The bird glided/hovered, moving in a north-south fashion, at a regular height of 7-8m, before eventually heading off west	0	300	0	0
20/01/2016	4	Unknown	Unknown	1	Unknown	28	12.18	Bird hunting in the NE section of the site. Hovering on many occasions, before flying off to the east	0	3,600	0	0

Kestrel												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
26/01/2016	1	Unknown	Unknown	1	Tree line at bog edge	29	13.55	Bird observed harassing a hen harrier to the west of the VP. It disappeared from view behind a tree-line	0	60	0	0
27/01/2016	10	Female	Unknown	1	Edge of cutaway near farmland	30	14.49	A female kestrel was observed to the south-west of the VP hunting along the edge of the bog adjacent to farmland and the road. The bird hovered at a height of 4-5m before flying off in a northerly direction at approx. 2-3m	0	60	0	0
02/02/2016	14	Pair	Adult	2	Bog edge/farmland	31	10.00	A male and female kestrel flew past the VP, heading from north to south, calling to and harassing each other. They flew at a height of 6-8m, moving quickly towards south of site	0	50	0	0
18/02/2016	9	Unknown	Unknown	1	Open cutaway bog	32	10.52	A kestrel was observed soaring to the south of the VP, at approx. 25-30m height before drifting off towards the south of the site	0	0	60	0
25/02/2016	3	Unknown	Unknown	1	Scrub	33	13.41	Bird observed to the east of the VP, hovering c.40m above the ground over an area of scrub. Bird moved in a westerly direction before drifting out of view	0	0	10	0
09/03/2016	6	Unknown	Unknown	1	Open peat bog	34a	15.36	Kestrel appeared from behind conifer trees to W of VP. Headed eastwards, stopping to hover in front of VP before veering off to SE	0	0	180	0
09/03/2016	6	Unknown	Unknown	1	Tree line at bog edge	34b	17.01	Kestrel appeared again briefly, presumably same bird, from behind same stand of conifer trees to W of VP, before going out of view	0	0	5	0
10/03/2016	6	Female	Adult	1	Edge of bog/spruce	35	11.04	Adult female was chased and harassed by a hooded crow as she flew W along the rail tracks, adjacent to conifers on the S side of site near to the VP. Bird flew approx. 10-12m high, over edge of bog	0	60	0	0

Kestrel													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
10/03/2016	7	Unknown	Adult	1	Woodland/scrub	36a	10.07	An adult kestrel was seen briefly hunting in the distance over woodland at edge of bog, in NW of site before disappearing behind tree line	0	0	10	0	
10/03/2016	7	Unknown	Unknown	1	Woodland/ open peat bog	36b	10.54	A kestrel was observed perched on top of a tree to the NE of the VP, at edge of bog, for approx 16 minutes. At 11.10am it flew off in a westerly direction, stopping briefly to hover over open bog to NE of VP, before veering off to the SE, c.60-70m above ground, before landing in another tree at edge of bog	1,080	0	120	0	
10/03/2016	7	Unknown	Unknown	1	Open peat/ roadway/ rail-line/ peat mound	36c	11.13	Kestrel left tree, harassed by a raven, and flew along southern edge of road/railway line, descending from 60m to 30m as it flew, before crossing over road to N side of site, low to ground (<10m) and landing on a peat mound to NW of VP. Bird appeared to be picking at insects before going out of view	10	0	90	0	
14/03/2016	11	Female	Adult	1	Improved grassland/ tree line	37	11.47	Female kestrel flew in north-easterly direction over fields to the south-east of the site	0	0	30	0	
14/03/2016	13	Male	Adult	1	Cutover/ bog woodland	38	15.38	Male seen hunting to south of VP	0	0	120	0	
15/03/2016	12	Female	Adult	1	Edge of bog/ tree line	39	15.00	A female kestrel flew into the west of the VP from the north of the road. She hunted at height of 4m along the edge of the tree line and bog to the west of the VP	0	60	0	0	
16/03/2016	8	Male	Adult	1	Farmland/ open bog	40	15.10	An adult male kestrel flew across the site from east to west at a height of 6-7metres	0	60	0	0	
16/03/2016	9	Unknown	Unknown	1	Peat mound	41	12.00	Bird perched on peat mound north of VP for 20 seconds before dropping out of view	20	0	0	0	

Kestrel													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
24/03/2016	4	Unknown	Unknown	1	Edge of bog	42	11.20	Observed hunting along the edge of the bog	0	180	0	0	
30/03/2016	2	Unknown	Unknown	1	Cutover/scrub/ rail line	43	11.45	Kestrel observed S of VP. It flew westwards across the track, stopped to hover for approximately 10 seconds before heading SW. Flew at between 10-25m height	0	0	10	0	
31/03/2016	3	Pair	Adult	2	Woodland/ wet grassland	44	11.17	Two kestrels, one following the other, flew into stand of mature trees, beyond NW corner of site (110 seconds at 10-12m), harassed by hooded crow. One stayed in trees and the other flew SW over wet grassland (10m). At 11.20am, the second bird flew towards track before veering around behind trees and landing. At 11.25am bird flew out, hunted in front of the trees (approximately 10m) then flew off north. Birds were observed outside site boundary	480	80	110	0	
									5,260	5,424	2,030	0	

Kingfisher													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
22/01/2016	10	Unknown	Unknown	1	Bog drain	1	-	A kingfisher was seen flying along a drain adjacent to the road outside the site boundary , to the south-west of the VP	0	6	0	0	
									0	6	0	0	

Lapwing												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
28/10/2015	15	Unknown	Unknown	34	Unknown	1	12.11	Flock observed outside the site boundary , at least 2km to the west of the site. Observed flying around in circles at >100m height	0	0	0	300
29/10/2015	14	Unknown	Adults	13	Farmland/open peat bog	2	10.10	Birds flew from the north through the site, at a height of 20m above ground, heading in a southerly direction. They flew over open peat bog until they disappeared from sight in the south of the site	0	120	0	0
03/12/2015	7	Unknown	Adults	11	Standing water	3	09.30	Birds observed feeding on a wet area just north of VP7 for the duration of the watch. Water levels had dropped dramatically overnight	10,800	0	0	0
14/12/2015	3	Unknown	Unknown	53	Standing water	4	-	Birds observed in flooded field just north of VP3, outside the site boundary , on the road to VP 1&2	n/a	n/a	n/a	n/a
									10,800	120	0	300

Lesser Black-backed Gull												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
09/03/2016	6	Unknown	Unknown	17	Roadway/edge of bog	1	15.00	Birds commuting along roadway to south of VP between 15:00 and 17:00. Generally heading in a NW direction having come from the E-SE, in groups of 2-3	0	0	0	720
16/03/2016	10	Unknown	Unknown	4	Unknown	2	14.40	Birds observed soaring at c.250m, outside site boundary , 1.5km west of	0	0	0	30

Lesser Black-backed Gull												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
								VP				
23/03/2016	5	Unknown	Adult	1	Bog/farmland	3	14.56	One bird flew over at a height of 8-10m. Believed to be on migration	0	60	0	0
25/03/2016	10	Unknown	Unknown	4	Pasture	4	09.48	Birds came into view flying in a westerly direction, at c.300m height, north of VP over pasture land before going out of view on horizon	0	0	0	40
25/03/2016	9	Unknown	Unknown	-	Pasture	5	13.32	Gulls observed flying south over pasture land at 300m height. Birds in view for 40 seconds before going out of view	0	0	0	40
29/03/2016	4	Unknown	Unknown	12	Farmland/roadway	6a	16.14	Birds observed flying from NE to W/SW, generally following the route of the road. Group very spread out	0	0	0	60
29/03/2016	4	Unknown	Unknown	17	Cutover/roadway	6b	1.34	Birds observed flying from NE to W/SW. Generally following the road. Group very spread out. Individuals observed for approx. 30 seconds	0	0	0	30
30/03/2016	2	Unknown	Unknown	4	Cutover/woodland	7a	10.20	Birds observed commuting over a mixture of woodland/cutover. They flew from the north-east to the south-west at approximately 100m height	0	0	0	20
30/03/2016	2	Unknown	Unknown	1	Cutover/scrub	7b	10.47	Bird flew from the north to the south of site at approximately 80m height	0	0	60	0
									0	60	60	940

Mallard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)

Mallard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
29/10/2015	14	Male	Adult	2	Bog drains/ rough peat bog	1	10.01	Birds flew out of a drain adjacent to the road and VP. They flew at a height of 4m before dropping back down in to the drain further up the bog	0	60	0	0
11/11/2015	7	Unknown	Unknown	14	Peat bog	2	10.30	Birds fed in drains and wet flush in open bog for the duration of the VP survey period	10,800	0	0	0
19/11/2015	13	Pair	Adult	2	Standing water	3	10.55	Pair observed sitting on standing water for the remainder of the VP survey period	4,800	0	0	0
20/11/2015	13	Unknown	Unknown	4	Standing water	4	13.45	Four birds were observed feeding in standing water for the remainder of the VP survey period	6,300	0	0	0
15/12/2015	2	Unknown	Adult	30	Peat bog/standing water	5	12.45	Birds observed feeding in an area of flooded bog to the west of the VP for the duration of the watch	10,800	0	0	0
16/12/2015	1	Male, female	Adult	3	Peat bog/standing water	6	12.59	Birds (2 males, 1 female) flew over the bog at a height of 8-10m before dropping down behind a tree-line to the north of the VP	0	120	0	0
19/01/2016	6	Unknown	Adult	4	Peat bog/standing water	7	10.30	Birds observed on wet area of bog, feeding in flash pond in northern end of site for duration of VP. Birds also observed preening and roosting on peat mounds	10,800	0	0	0
21/01/2016	5	Pair	Adult	2	Wet drain at bog edge	8	11.36	Pair flew up from a drain and flew off to the north at a height of 2-4m before landing in a wet area of bog	0	60	0	0
26/01/2016	1	Unknown	Adults	2	Peat bog	9	10.10	Two birds flushed from bog. They flew north-eastwards at a height of approx. 60m before going out of view behind the tree line	0	0	60	0
26/01/2016	2	Unknown	Unknown	10	Edge of flooded area	10	10.00	Birds observed sitting roosting at the edge of a bog pool to the west of VP2 for the duration of the watch	10,800	0	0	0

Mallard												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
10/03/2016	6	Pair	Adult	2	Roadway, conifer, peat bog	11	11.25	Pair flew in over the main road from a SW/W direction along railway line before turning northwards and dropping onto the bog. Height ranged from 2-8m	0	60	0	0
10/03/2016	7	Unknown	Unknown	3	Open peat bog	12	11.43	Birds observed commuting across the SW corner of the site at c.120m above ground	0	0	0	70
14/03/2016	11	Unknown	Unknown	1	Cutover bog	13	10.09	One bird flew off in a ESE direction after being disturbed by a worker on the bog	0	15	0	0
29/03/2016	5	Unknown	Unknown	3	Peat bog	14	15.30	Birds spent the duration of the VP feeding in a pond in the middle of the bog	10,800	0	0	0
30/03/2016	1	Unknown	Unknown	4	Cutover bog	15a	14.48	Birds flew from N to SE before disappearing from view	0	0	30	0
30/03/2016	1	Unknown	Unknown	2	Cutover bog	15b	15.16	Birds flew from NE to SW. They disappeared behind trees	0	0	20	0
30/03/2016	1	Unknown	Unknown	1	Cutover bog	15c	16.16	Bird flew from the NE across the front of the VP heading in a southerly direction	0	0	15	0
30/03/2016	2	Male	Adult	1	Cutover/scrub	16a	10.11	Male flew from W of VP north eastwards before turning south at approximately 100m height	0	0	60	0
30/03/2016	2	Unknown	Unknown	7	Peat bog	16b	-	Birds observed in pools and flying around a section of bog SW of the VP	120	0	30	0
31/03/2016	3	Unknown	Unknown	1	Uncut bog	17	17.06	Bird observed flying low (2m) over uncut bog	0	35	0	0
									65,220	350	215	70

Merlin												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
09/10/2015	14	Female	Unknown	1	Peat bog	1	10.17	Female observed flying low over bog in a north-westerly direction (<10m height). Bird perched on a peat mound before dropping out of view	2	4	0	0
09/10/2015	15	Female	Adult	1	Peat bog	2	13.54	Female adult observed flying low over bog before going out of view behind a peat mound. The bird was flying in a easterly direction south-west of the VP	0	8	0	0
15/10/2015	11	Female	Adult	1	Peat bog	3	11.26	Female observed flying in a westerly direction over bog before going out of view behind peat mound	0	3	0	0
19/11/2015	11	Female	Adult	1	Peat bog	4	14.46	An adult female was observed perched on a peat mound to the north of the VP before going out of view behind the mound	780	0	0	0
02/12/2015	12	Female	Juvenile	1	Peat bog/cutover	5	12.38	Bird observed sitting on a peat mound in the middle of the site. It sat for 5 minutes before flying off low (2m height) towards the north-east of the site	300	30	0	0
07/12/2015	11	Male	Adult	1	Peat bog	6	12.28	An adult male was observed perched on a peat mound. When spotted the bird flew west behind the mound and out of view	4	2	0	0
15/12/2015	1	Male	Juvenile	1	Peat bog	7	12.23	A juvenile male flew low hunting over open bog. The bird arrived in from the north, flying at a height of 1-3m, as it moved south over cutover bog to the east of the road and VP	0	120	0	0
16/12/2015	1	Male	Juvenile	1	Peat bog/standing water	8	12.48	An immature bird, believed to be male, flew fast and low, hunting over the site, from the north to south, at a height of 1m over flooded bog	0	60	0	0

Merlin												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
06/01/2016	15	Female	Adult	1	Peat bog	9	15.34	A Merlin, likely female, flew in from the south at a height of 3-4m, dropping to 1m above the ground once it had flown over the road. The bird then flew north through the bog at a height of 1m above ground	0	60	0	0
14/01/2016	9	Female	Adult	1	Peat bog	10	14.50	An adult female was observed perched on a peat mound to the north-west of VP before flying NW over the bog at 2m height and out of view	240	30	0	0
27/01/2016	3	Male	Adult	1	Open peat bog	11	15.17	An adult male was seen hunting very low over open bog to the north-east of the VP. The bird was observed hunting at <1m height before disappearing behind a pile of peat	0	60	0	0
24/02/2016	1	Male	Adult	1	Open cutaway bog	12	13.10	One adult male flew low onto the bog (1-3m) from the north-east, landed on a tree then flew off to the south-east. Bird appeared to be hunting. Total time observed 60 seconds at <10m height	10	60	0	0
09/03/2016	7	Female	Adult	1	Bog edge/hedgerow/tree line	13	16.01	An adult female hunted low along southern edge of road/railway line heading E to W. Hunted less than 0.5m off the ground	0	30	0	0
									1,336	467	0	0

Mute Swan													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
14/12/2015	3	Unknown	Adults	4	Standing water	1	-	Four mute swans observed feeding in a flooded field, just north of VP3, on the road to VP 1&2. Birds observed outside site boundary	n/a	n/a	n/a	n/a	
26/01/2016	1	Unknown	Adults	2	Standing water	2	13.15	Two mute swans were observed feeding at the edge of a flooded area of bog to the north-east of the VP for the duration of the watch	10,800	0	0	0	
29/03/2016	5	Unknown	Adults	2	Standing water	3	15.30	Two mute swans spent the duration of the VP feeding in a pond in the middle of the bog	10,800	0	0	0	
									21,600	0	0	0	

Peregrine													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
12/11/2015	7	Male	Adult	1	Cutaway bog	1	12.34	Bird observed sitting on a peat mound adjacent to a large body of water in the north of the site. It flew low over the water disturbing a mallard before flying back to the mound. It then flew back over the water, attacking a female mallard which kept diving below the surface, before the peregrine landed on rushes at the water's edge	150	660	0	0	
21/01/2016	5	Male	Adult	1	Cutover bog	1	9.55	Bird sitting on plastic-covered peat mound to the west of the VP. At 10.12 the bird flew off low to the south at height of 2m	1,020	180	0	0	
									1,170	840	0	0	

Snipe												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
13/10/2015	13	Unknown	Adult	1	Gorse scrub	1	12.55	Adult bird disturbed. The bird flew south over gorse for 100m before disappearing from view	0	3	0	0
16/10/2015	10	Unknown	Adult	1	Gorse scrub	2	-	Adult bird disturbed by the roadside. It flew in a north-westerly direction at 3m height for approximately 70m before going out of view	0	3	0	0
29/10/2015	14	Unknown	Adult	2	Peat bog	3	09.00	Two birds were sitting tight on the bog along a peat ridge for the duration of the survey	10,800	0	0	0
12/11/2015	6	Unknown	Unknown	1	Peat bog	4	11.25	One bird flew in over the VP from the south, at a height of 4m, dropping down into an area of rush which had re-grown over cutaway peat	0	60	0	0
17/11/2015	10	Unknown	Unknown	1	Cutaway bog	5	14.46	Bird flushed from drain adjacent to the road, as a result of tractor activity. It flew at a height of 2-3m before dropping back down to bog on the north side of the road	0	30	0	0
18/11/2015	10	Unknown	Unknown	6	Raised bog	6	12.46	Birds flushed from an area of high quality bog to the north of the road. They flew in a north-north-easterly direction over the bog, at a height of 1-2m, before going out of sight	0	40	0	0
04/12/2015	10	Unknown	Adult	2	Gorse scrub	7	10.34	Birds observed flying west approximately 1m above gorse scrub	0	3	0	0
07/12/2015	11	Unknown	Unknown	1	Grassland	8	12.17	Snipe flushed by surveyor on the way to the VP. Bird flew from edge of bog just south of VP in a southerly direction over grassland before going out of view behind a hedgerow	0	3	0	0
15/12/2015	2	Unknown	Unknown	1	Standing water	9	12.45	Bird observed feeding on standing water due west of the VP for the duration of the watch	10,800	0	0	0
07/01/2016	15	Unknown	Unknown	1	Boundary between roadway and open bog	10	9.31	Snipe flushed from the roadside, flying off in a south-easterly direction at a height of 1-3m	0	60	0	0
19/01/2016	6	Unknown	Unknown	2	Cutover bog/standing water	11	-	Birds observed foraging in wet area of the bog, towards the southeast of the site	10,800	0	0	0

Snipe													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
25/02/2016	10	Unknown	Adult	1	Heath	12	11.14	Adult flushed from the north-eastern section of the site. The bird flew off in a north-westerly direction, at approx. 2m height, over heather and went out of view	0	3	0	0	
14/03/2016	11	Unknown	Unknown	1	Wet/improved grassland	13	11.30	Snipe flushed by fieldworker	0	3	5	0	
16/03/2016	10	Unknown	Unknown	1	Raised bog	14	14.40	Snipe calling north of VP on raised bog	n/a	n/a	n/a	n/a	
18/03/2016	11	Unknown	Unknown	1	Cutover/wet grassland	15a	14.05	Snipe flushed by fieldworker from edge of bog	0	5	0	0	
18/03/2016	11	Unknown	Unknown	2	Cutover/wet/improved grassland	15b	14.16	Birds flushed by fieldworker from grassy vegetation at edge of bog to improved grassland to the east of the site	0	5	0	0	
									32,400	218	5	0	

Sparrowhawk													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
14/10/2015	12	Female	Adult	1	Woodland	1	-	Female bird observed hovering south-east of VP at approximately 100m height. Bird then dropped out of sight into trees	0	0	130	0	
29/10/2015	15	Female	Adult	1	Peat bog	2	13.29	A large female was observed flying low over a road and along a peat embankment, heading in a south-westerly direction hunting	0	60	0	0	
19/11/2015	13	Female	Unknown	1	Peat bog	3	10.27	A female was observed flying east over bog at a height of 2-3m. It went into trees and out of view	0	3	0	0	

Sparrowhawk													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
24/11/2015	4	Female	Adult	1	Hedgerow	4	11.58	An adult female was observed flying in a northerly direction, approximately 5m above a hedgerow, east of the VP. It then went out of view behind the hedgerow	0	3	0	0	
02/12/2015	7	Male	Adult	1	Cutover bog	5	14.10	An adult male flew low over the bog (1-2m high) hunting, from the north side of the VP to the east. It flew low across the road and off over the cutover bog towards farmland and hedgerows in the east	0	60	0	0	
08/12/2015	13	Male	Adult	1	Roadway	6	13.56	An adult male was observed flying along the road in a northerly direction at a height of 0.5m. The bird was in view for 4 seconds before disappearing behind a hedgerow	0	4	0	0	
14/12/2015	8	Female	Adult	1	Peat bog	7	15.43	A female flew out of farmland to the east of the VP over open bog hunting at a height of 7m. The bird flew past quickly in a westerly direction	0	60	0	0	
06/01/2016	15	Female	Adult	1	Peat bog	8	14.38	An adult female flew low and fast over the site from east to west, at a height of 1-2m	0	60	0	0	
14/01/2016	6	Female	Adult	1	Cutover bog	9	14.17	A female flew low across the bog, at approximately 2m height, hunting. The bird was first observed north-west of the VP and flew in a south-easterly direction	0	60	0	0	
22/01/2016	10	Female	Unknown	1	Hedgerow	10	13.18	Female bird hunting low along hedgerow near the roadside to the west of the bog	0	60	0	0	
02/02/2016	14	Female	Juvenile	1	Open cutover bog	11	12.38	A juvenile female flew quickly across the bog and main road to the south of the VP, heading from west to east. The bird flew low (<1m) as it hunted	0	40	0	0	

Sparrowhawk													
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)	
04/02/2016	8	Male	Juvenile	1	Open bog/farmland	12	10.57	A juvenile male flew in from the south, close to the VP, having been harassed by a hooded crow in the south-eastern corner of the site. It flew over bog and farmland (6-8m height), heading towards a tree line in the east of the site	0	40	0	0	
04/02/2016	12	Male	Adult	1	Cutaway bog	13	14.03	An adult male was observed hunting low (<4m height) over an area of old, cutaway bog to the south-west of the VP before heading off over trees to the west	0	50	0	0	
16/02/2016	6	Female	Adult	1	Edge of open cutaway bog	14	13.57	An adult female was observed hunting low over the bog next to a railway line immediately south of VP6. The bird flew less than 1m above the ground from west to east	0	40	0	0	
11/03/2016	15	Female	Adult	1	Cutover bog/roadway	15	09.16	A large female sparrowhawk flew over the VP from a westerly direction at a height of 4-5m. The bird was just passing over/ through the area	0	45	0	0	
15/03/2016	8	Female	Adult	1	Farmland	16	10.46	A large female sparrowhawk hunted over farmland, to the SW of the VP while being harassed by hooded crows. She hunted 4-5m high over fields before being chased off to the west	0	60	0	0	
30/03/2016	2	Male	Adult	1	Railway line	17	16.45	A male sparrowhawk was observed hunting low, less than a metre from the ground, over the railway line from N-S. Very brief sighting	0	10	0	0	
									0	655	130	0	

Teal												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
14/12/2015	3	Unknown	Unknown	40	Standing water	1	-	Just north of VP 3, outside the site boundary on the road to VP 1&2, there were 40 birds in a flooded field	n/a	n/a	n/a	n/a
16/12/2015	1	Unknown	Unknown	12	Standing water	2	-	Birds observed in flooded fields to the south of the VP location, outside the site boundary				
16/12/2015	2	Unknown	Unknown	25	Standing water/ peat bog	3	09.30	Flock observed feeding in flooded bog to the west of the VP. They remained in-situ for the duration of the VP	10,800	0	0	0
26/01/2016	2	Unknown	Unknown	6	Bog pool	4	10.00	Birds observed sitting roosting at edge of bog pool to the west of the VP where they remained for the duration of the watch	10,800	0	0	0
									21,600	0	0	0

Whooper Swan												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
14/10/2015	2	Unknown	Adult	3	Cutover bog/willow scrub	1	10.14	Birds flew in from the south-east of the site, at approx. 20m, and landed in area of cutover bog to the northwest of the VP	0	0	35	0
29/10/2015	14	Unknown	Adult	4	Peat bog/ farmland	2	09.17	Birds flew from the western side of the site in a south-easterly direction towards the south of the site. They flew at a consistent height of 15m above the ground	0	0	120	0
20/11/2015	11	Unknown	Unknown	1	Peat bog	3	09.43	One bird was observed flying in a south-westerly direction over bog at a height of 30m. Bird went out of view behind	0	0	70	0

Whooper Swan												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
								tree-line				
02/12/2015	7	Unknown	Unknown	2	Standing water	4	13.30	Two birds spent the duration of the VP watch feeding in an area of standing water just north of VP	10,800	0	0	0
03/12/2015	7	Unknown	Unknown	2	Standing water	5	09.30	Two birds were observed feeding on a waterlogged area directly north of the VP for the duration of the VP watch. Water levels had dropped dramatically overnight	10,800	0	0	0
14/12/2015	3	Unknown	Unknown	86	Standing water	6	-	Just north of VP3, on the road to VP 1&2, there were 86 birds in a flooded field outside of the site boundary , mixed with wildfowl and waders	n/a	n/a	n/a	n/a
15/12/2015	2	Unknown	Unknown	22	Cutover/flooded bog	7	12.45	Birds observed feeding in a flooded area of bog, due west of the VP, for much of the duration of the watch. Six birds departed from this group, heading off east at a height of 15-20m, then turned and flew back towards the flooded area. These birds then headed south before turning to the east and dropping back down onto the bog behind a tree-line	10,800	300	0	0
14/01/2016	6	Family	Adults (2), Juveniles (4)	6	Cutover bog	8	14.15	A family group comprising 2 adults and 4 juveniles flew across the bog from the east of the site heading in a westerly direction. They flew towards the River Shannon at a height of 6-10m. The birds then turned back into the site and landed in an area of standing water to the north-west of the VP, where they remained for the duration of the watch	6,300	120	0	0

Whooper Swan												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
19/01/2016	6	M/F	Ad/Juv	72	Standing water	9	13.30	Flock observed for the duration of the VP foraging in standing water, towards the northern part of the site. Many birds sitting up on the mounds of peat, roosting and preening	10,800	0	0	0
20/01/2016	4	Unknown	Unknown	2	Open bog	10	10.40	Birds flew in from west to east, at the north end of the site, close to VP5 at a height of approx. 12-16m over cutover bog	0	0	120	0
20/01/2016	5	Unknown	Unknown	2	Clear-fell forestry/ cutover	11	14.59	Birds flew in low over felled spruce forestry from the west and landed out of sight on standing water on cutover bog. Flight height 3-4m. Birds consistently calling as flying	0	60	0	0
21/01/2016	5	Unknown	Unknown	2	Edge of cutover bog	12	10.07	Two whooper swans flew over the west side of the site, approx 10m in height, commuting SW	0	0	60	0
26/01/2015	1	M/F	Adult	26	Flooded bog	13a	13.15	Flock observed sitting roosting at the edge of flooded bog in the east of the site. They remained in-situ for the duration of the VP watch	10,800	0	0	0
26/01/2016	1	M/F	Adult	26	Edge of cutover bog	13b	10.00	Flock observed roosting on edge of bog to the north-east of the VP	10,800	0	0	0
09/02/2016	6	M/F	Mixed	148	Agricultural grassland	14	-	Flock observed in fields to the east of the VP in Bunacloy/Killeen, outside of the site boundary	n/a	n/a	n/a	n/a
11/02/2016	5	Unknown	Unknown	30-40	Unknown	15	-	Flock observed north-east of VP, flying in a northerly direction, outside of the site boundary . View of birds in flight obscured by trees				
16/02/2016	6	Unknown	Unknown	40	Flooded cutover bog	16	13.30	Flock spent the duration of the VP feeding in a flooded area of bog to the north-west of the VP	10,800	0	0	0

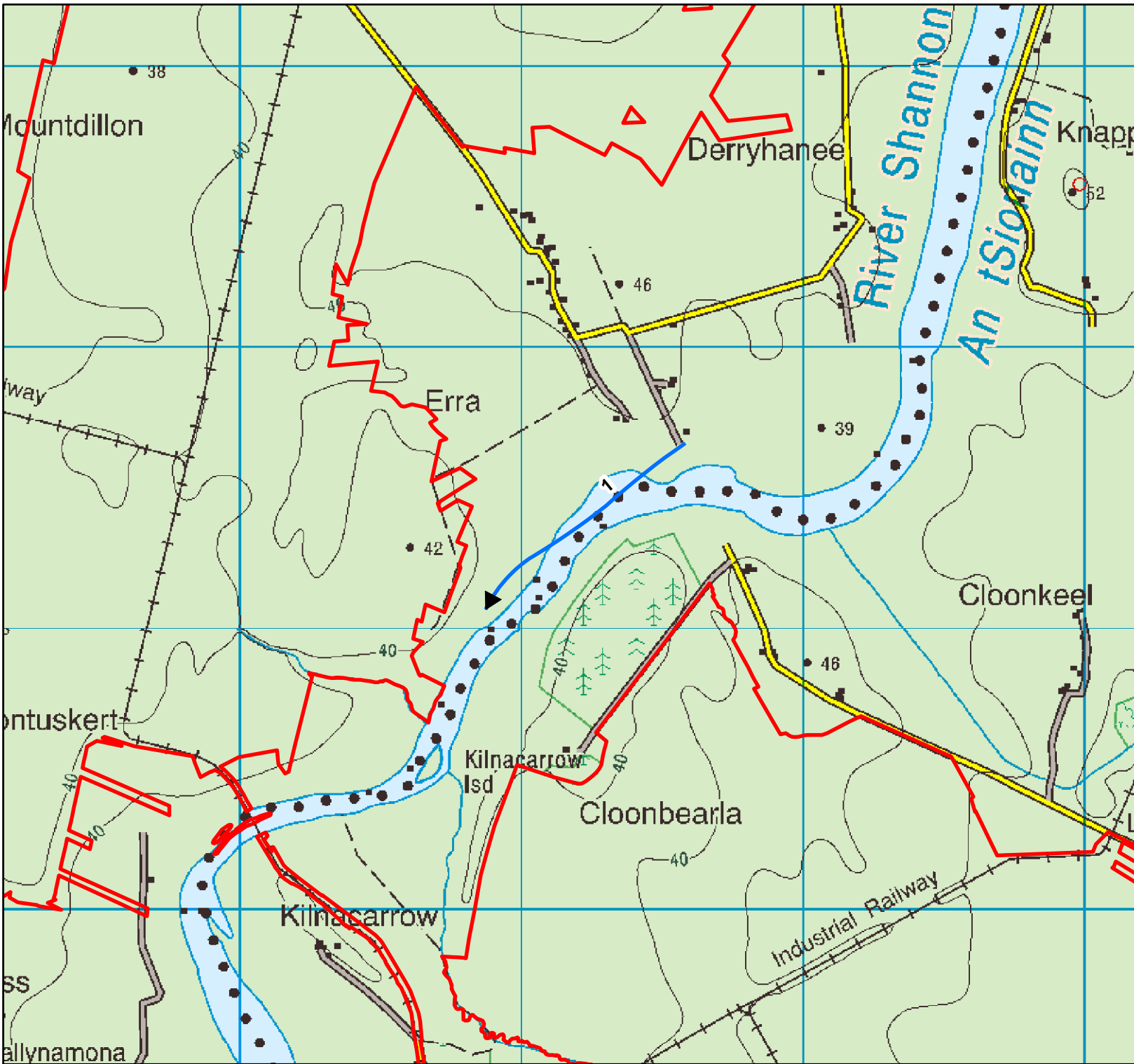
Whooper Swan												
Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
24/02/2016	1	Unknown	Unknown	8	Open cutaway bog	17a	10.30	Birds observed feeding and roosting on flooded area of bog to the north-east of the VP for the duration of the watch	10,800	0	0	0
24/02/2016	1	Unknown	Adults	20	Open cutaway bog	17b, 17c, 17d	14.00	Flock observed roosting on the bog to the north-east of the VP from the beginning of the watch. At 15.40 they were joined by another seven birds which flew in from the north-west. At 16.01 a further five adults flew in from the same direction, having left an area of standing water to the north-west of the VP	10,800	20	0	0
14/03/2016	11	Unknown	Unknown	2	Cutover bog	18	11.02	Two unidentified swans (thought to be whooper swans) flew over the bog in a north-westerly direction between 10-100m height	0	0	40	0
23/03/2016	5	Unknown	Adult	8	Open water on bog	19	13.41	Birds flushed from a large pool of water in the bog by a worker. The birds flew off northwards, low at a height of 2-3m, before landing in the same pool of water further up the bog, where they remained for the remainder of the VP	9,180	60	0	0
29/03/2016	5	Unknown	Unknown	5	Peat bog	20	15.30	Birds spent the duration of the VP feeding in a pond in the middle of the bog north-east of the VP	10,800	0	0	0
									123,480	560	445	0

Woodcock

Date	VP	Sex	Age	No. of Birds	Habitat	Map Ref. No.	Time of Flight/Obs.	Flight Behaviour	Time in non-flight (secs)	Flight time at <10 metres (secs)	Flight time at 10-100 metres (sec)	Flight time at >100 metres (sec)
20/01/2016	5	Unknown	Unknown	1	Mixed woodland	1	15.55	Individual flushed from dense cover. The bird flew about 4m away before dropping down into dense bramble	0	10	0	0
									0	10	0	0

Appendix 5

Flight Paths





Project Title:
Bord na Mona Bird Survey

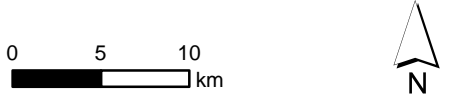
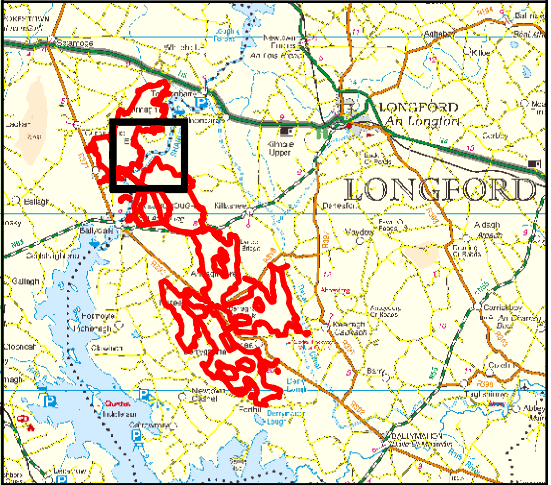
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Winter 2015-2016 Bird Survey
Black Headed Gull Flight Path

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

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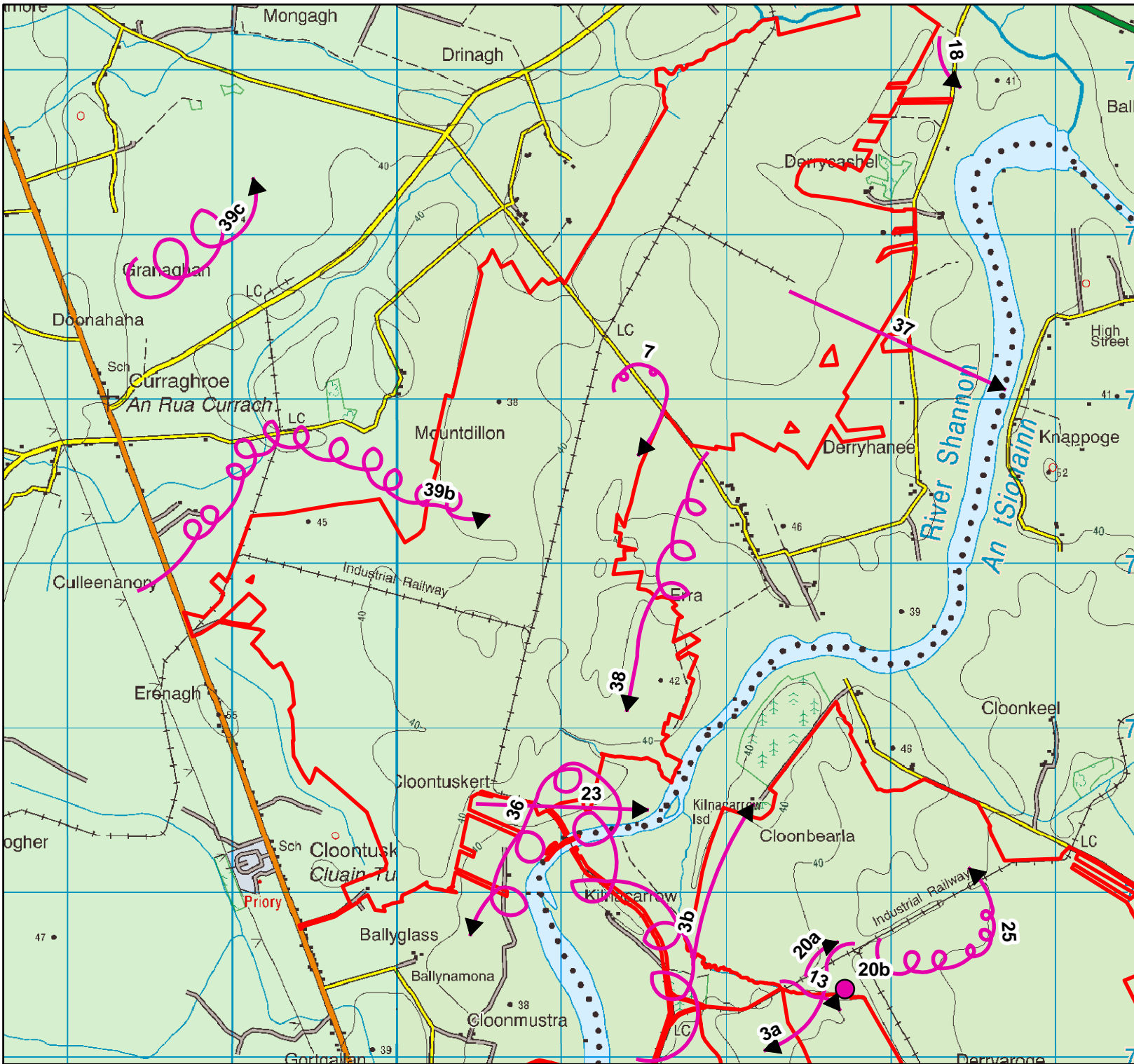
-  Black Headed Gull Flight Path
-  Summer Bird Survey Area



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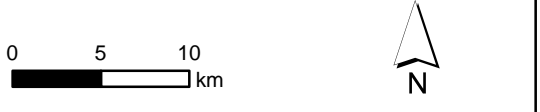
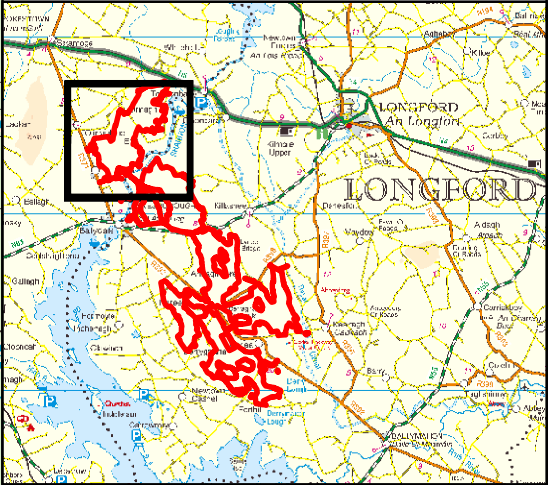
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Buzzard Observations 1 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

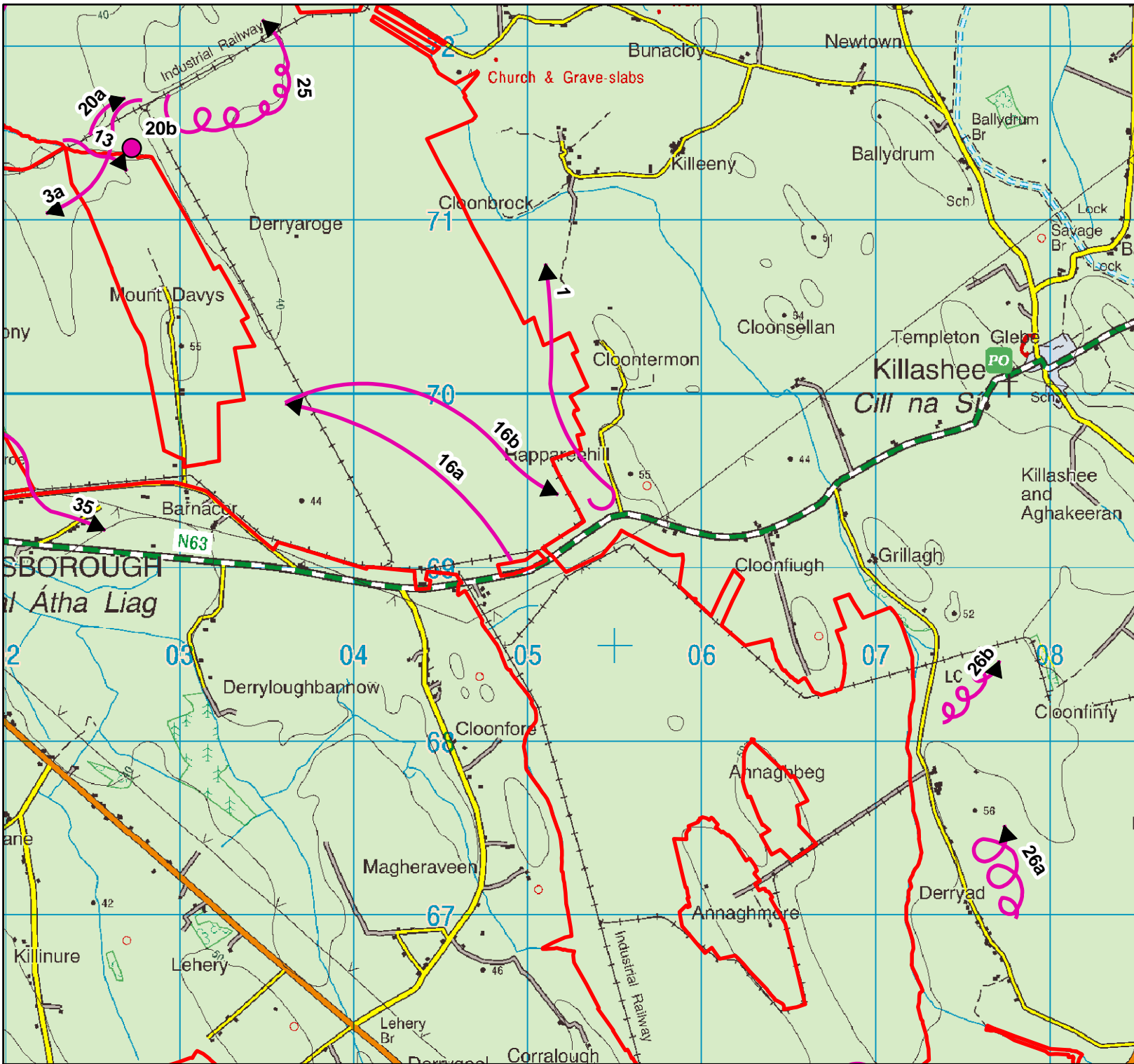
- Legend**
-  Buzzard Observation Point
 -  Buzzard Flight Path
 -  Buzzard Observation Area
 -  Summer Bird Survey Area



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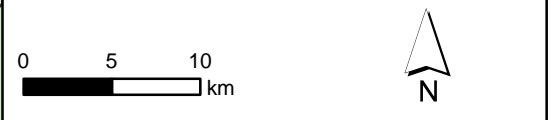
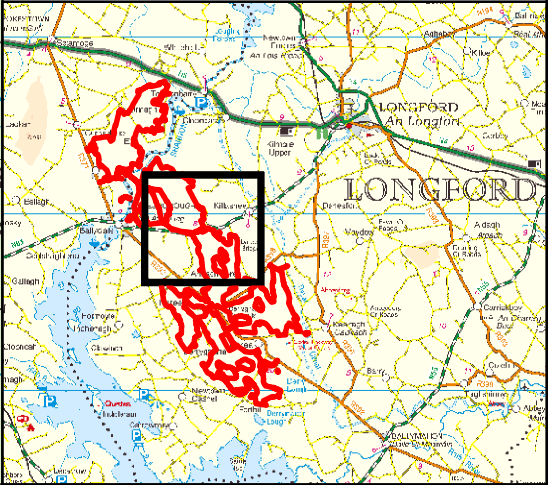
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Buzzard Observations 2 of 4

Client: Bord na Mona

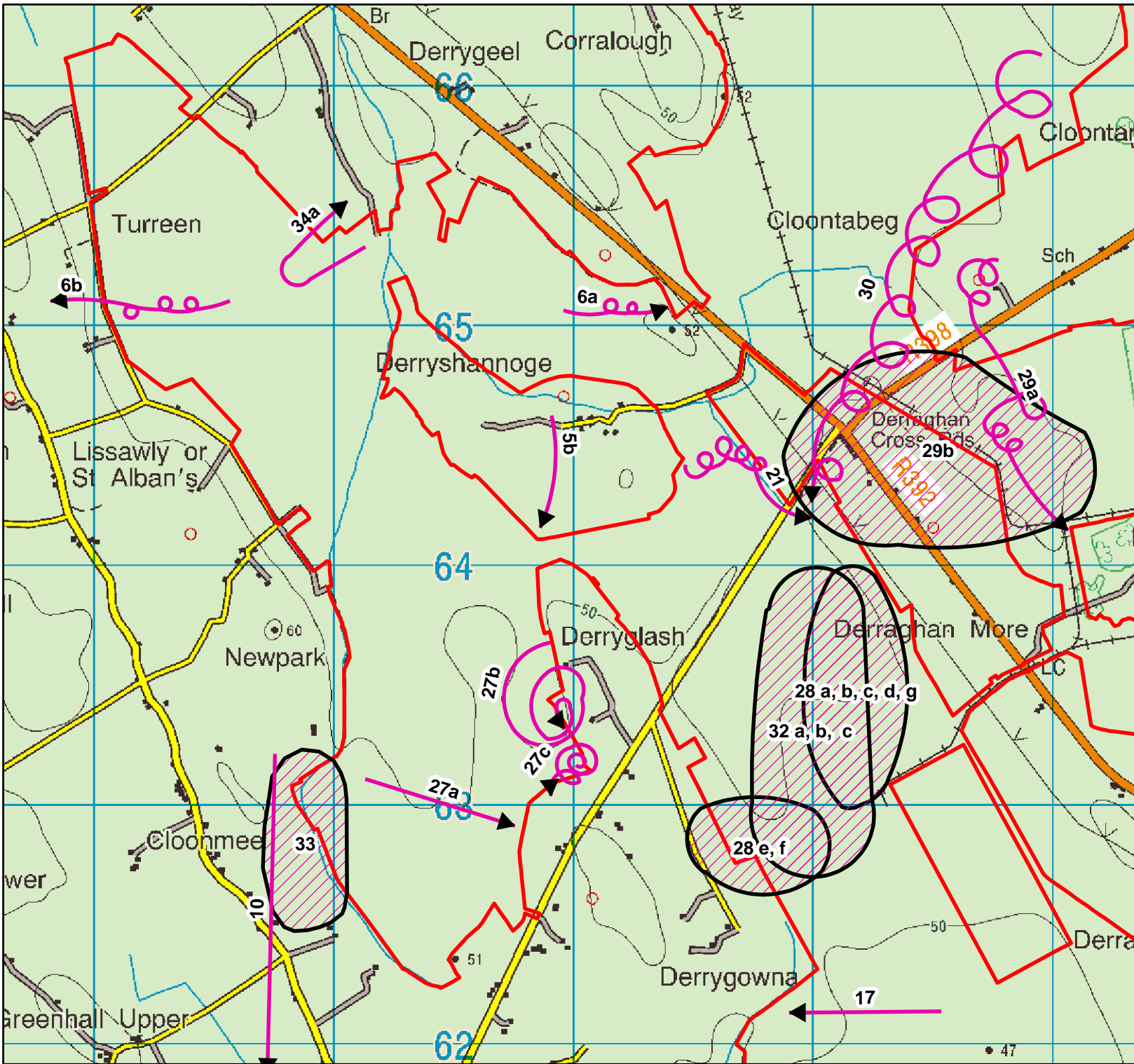
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Drawing Size: A4

- Legend
- Buzzard Observation Point
 - Buzzard Flight Path
 - Buzzard Observation Area
 - Summer Bird Survey Area



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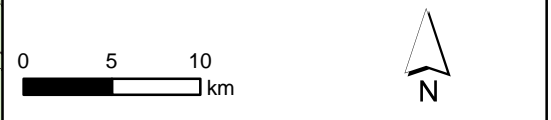
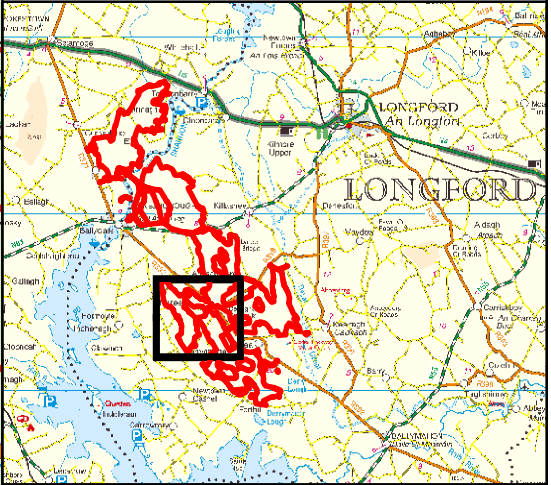
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Bord na Mona Bird Survey

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Winter 2015-2016 Bird Survey
Buzzard Observations 3 of 4

Client: Bord na Mona

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Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

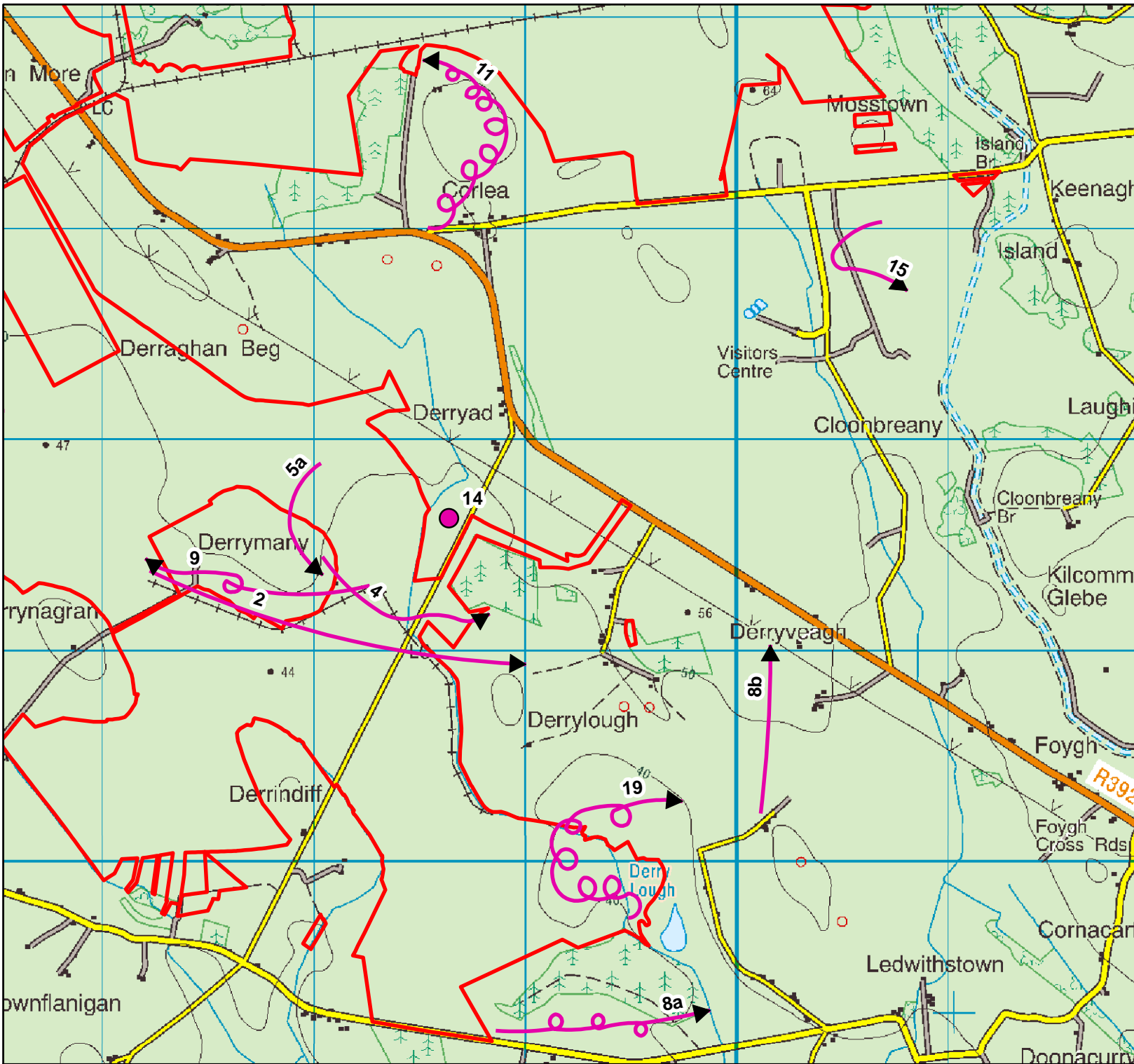
- Legend
-  Buzzard Observation Point
 -  Buzzard Flight Path
 -  Buzzard Observation Area
 -  Summer Bird Survey Area



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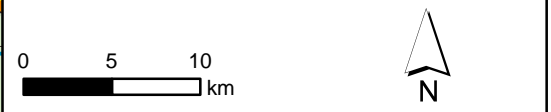
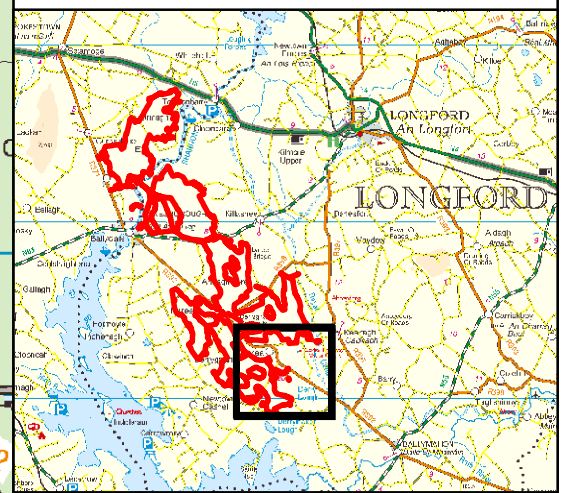
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Buzzard Observations 4 of 4

Client: Bord na Mona

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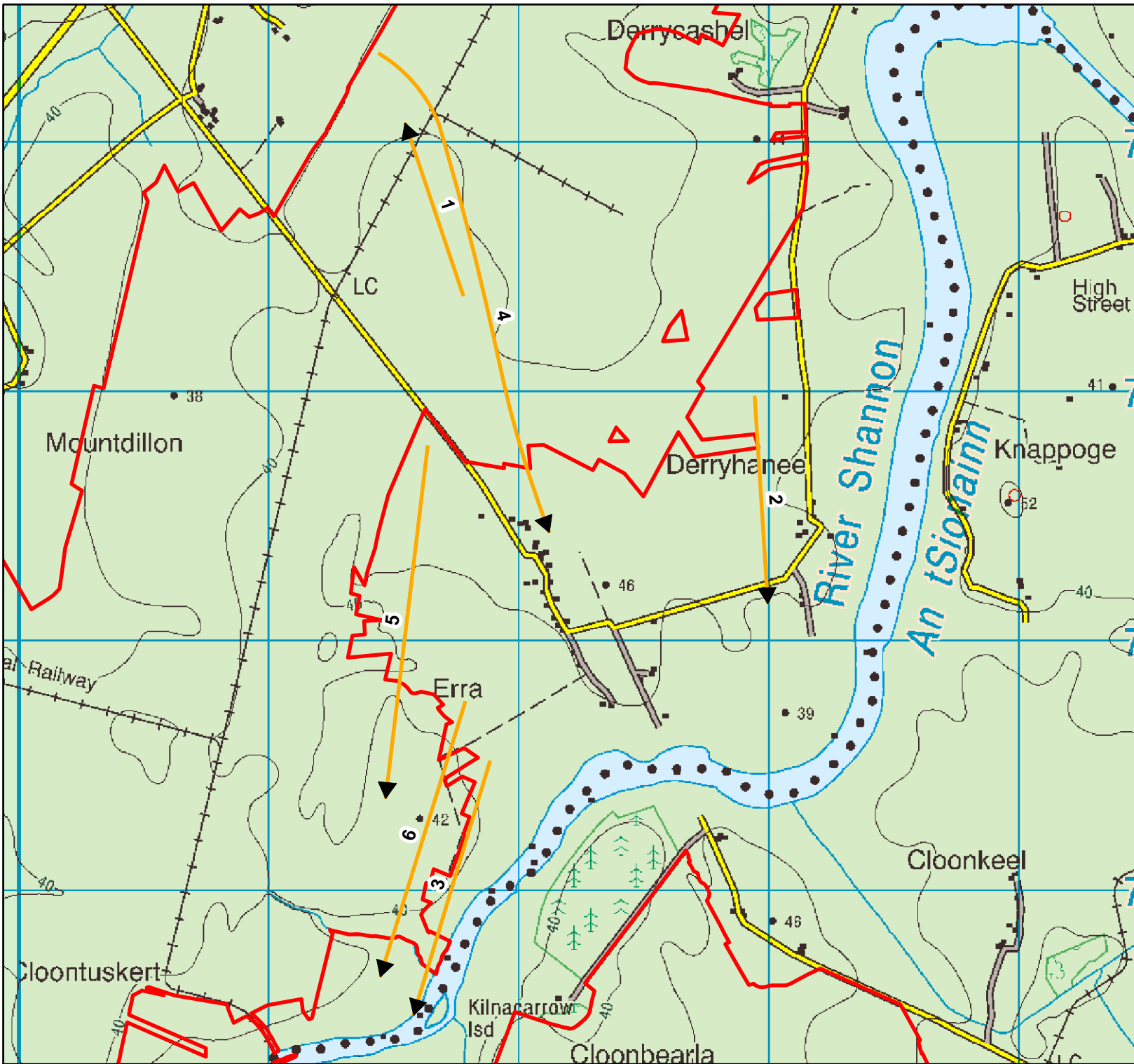
- Legend
-  Buzzard Observation Point
 -  Buzzard Flight Path
 -  Buzzard Observation Area
 -  Summer Bird Survey Area



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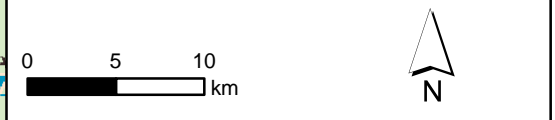
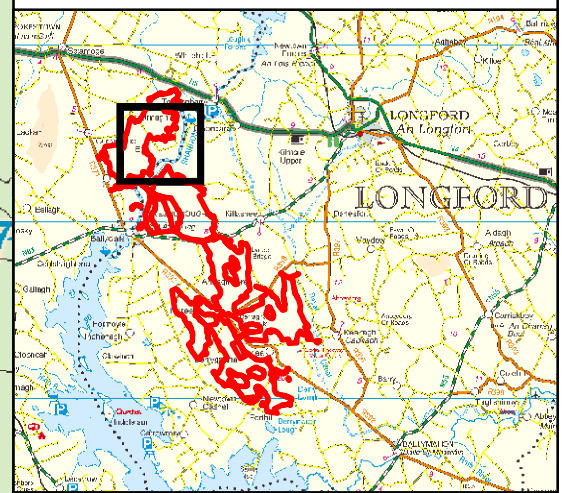
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
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Client: Bord na Mona

Drawn by: JK
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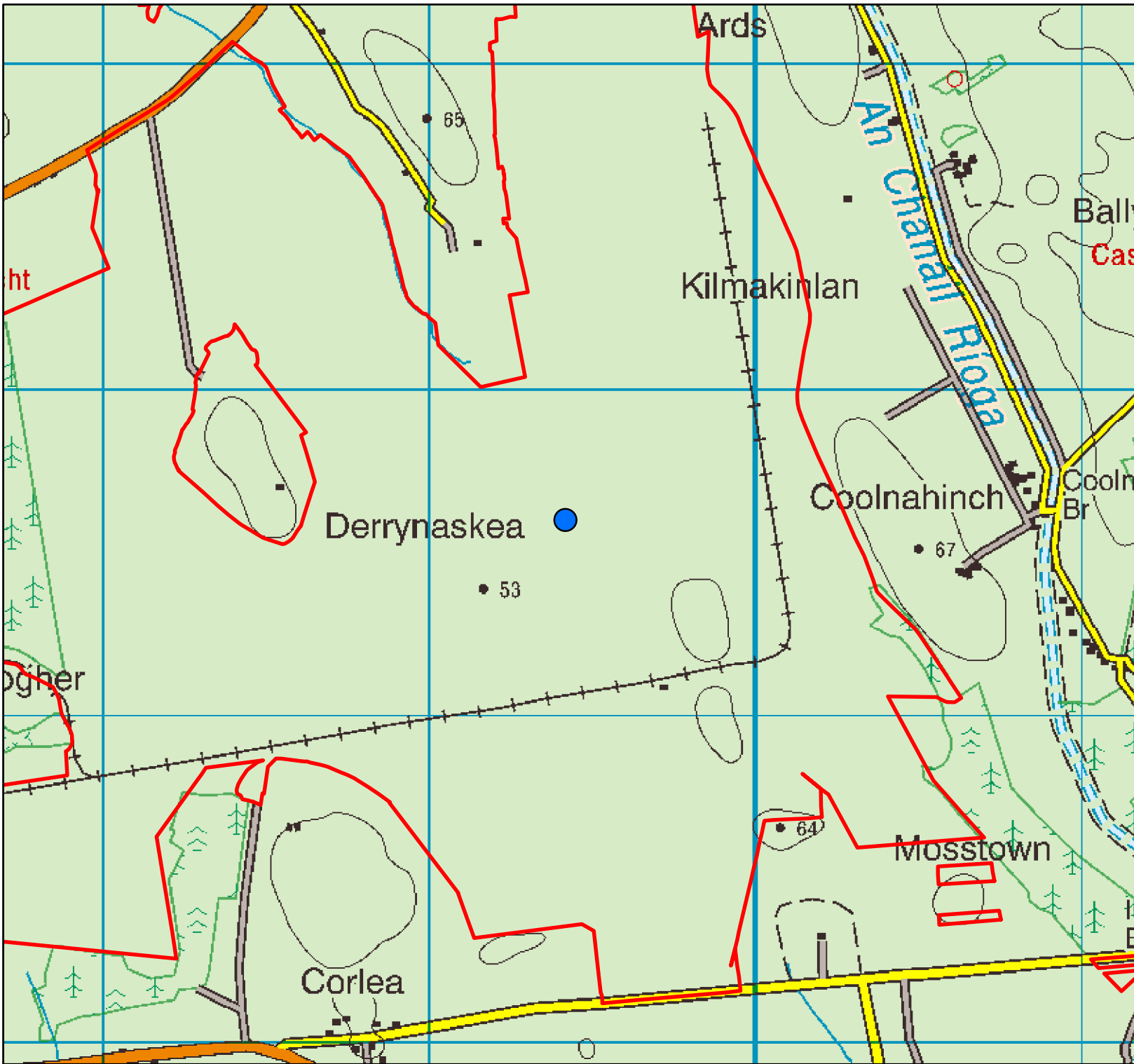
- Legend
-  Cormorant Flight Path
 -  Summer Bird Survey Area



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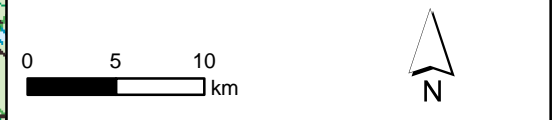
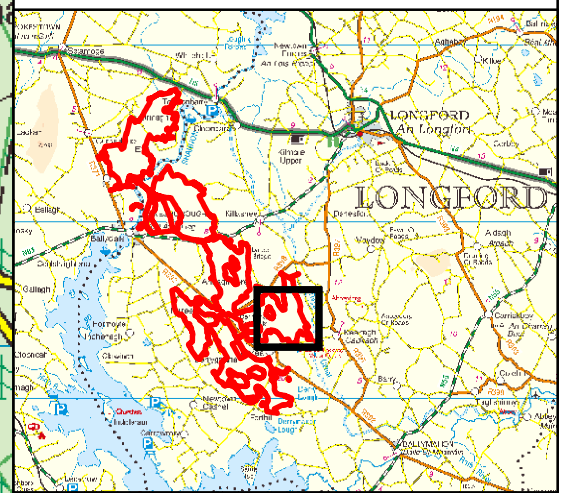
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Winter 2015-2016 Bird Survey
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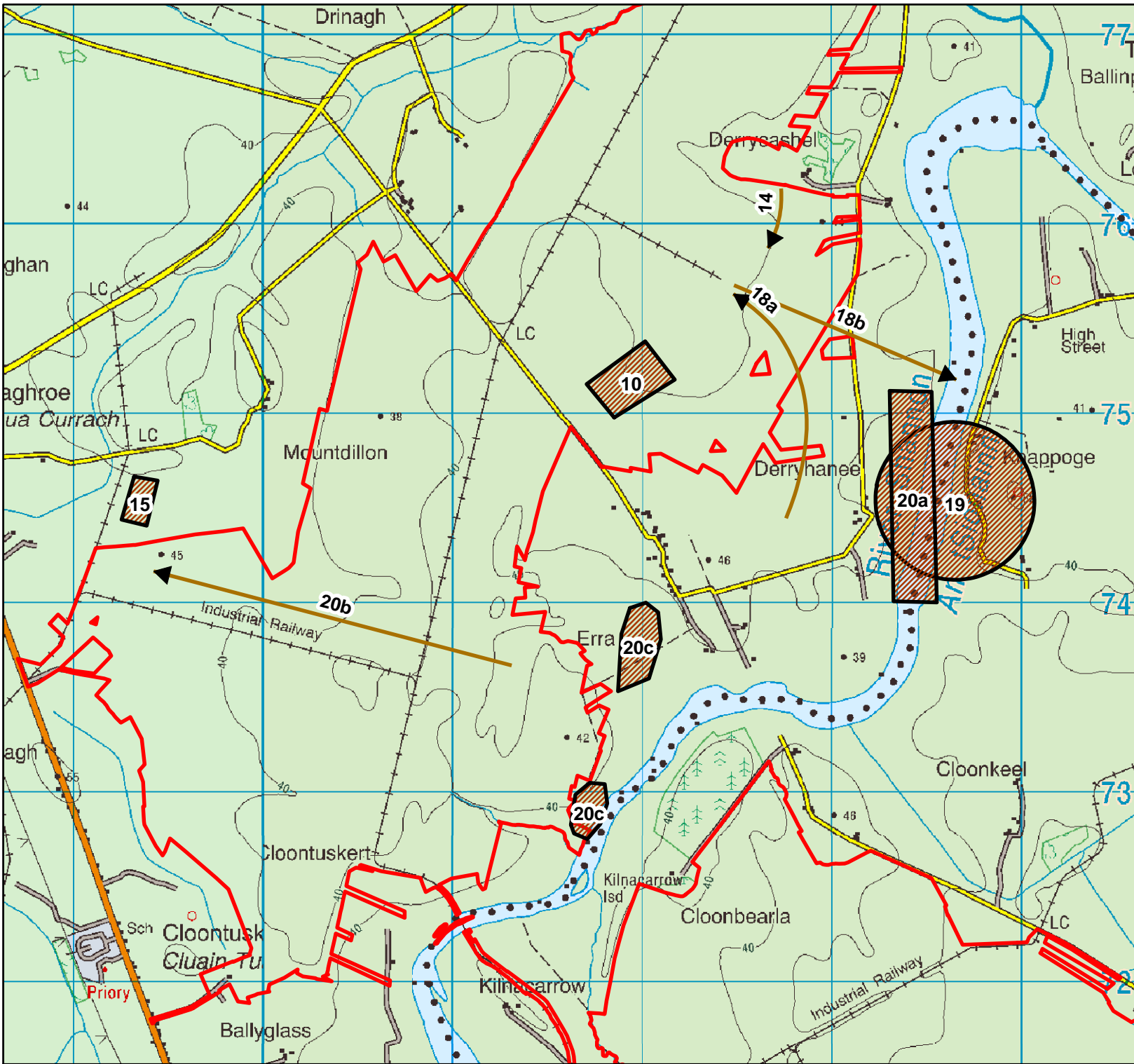
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Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
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- Legend
- Curlew Observation
 - Summer Bird Survey Area



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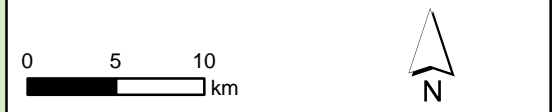
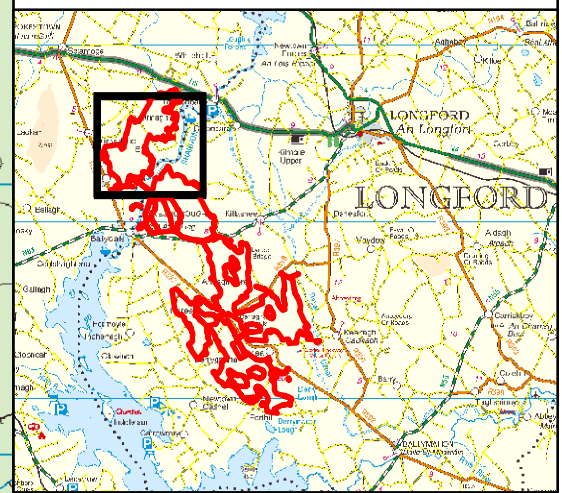
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Golden Plover Observations 1 of 4

Client: Bord na Mona

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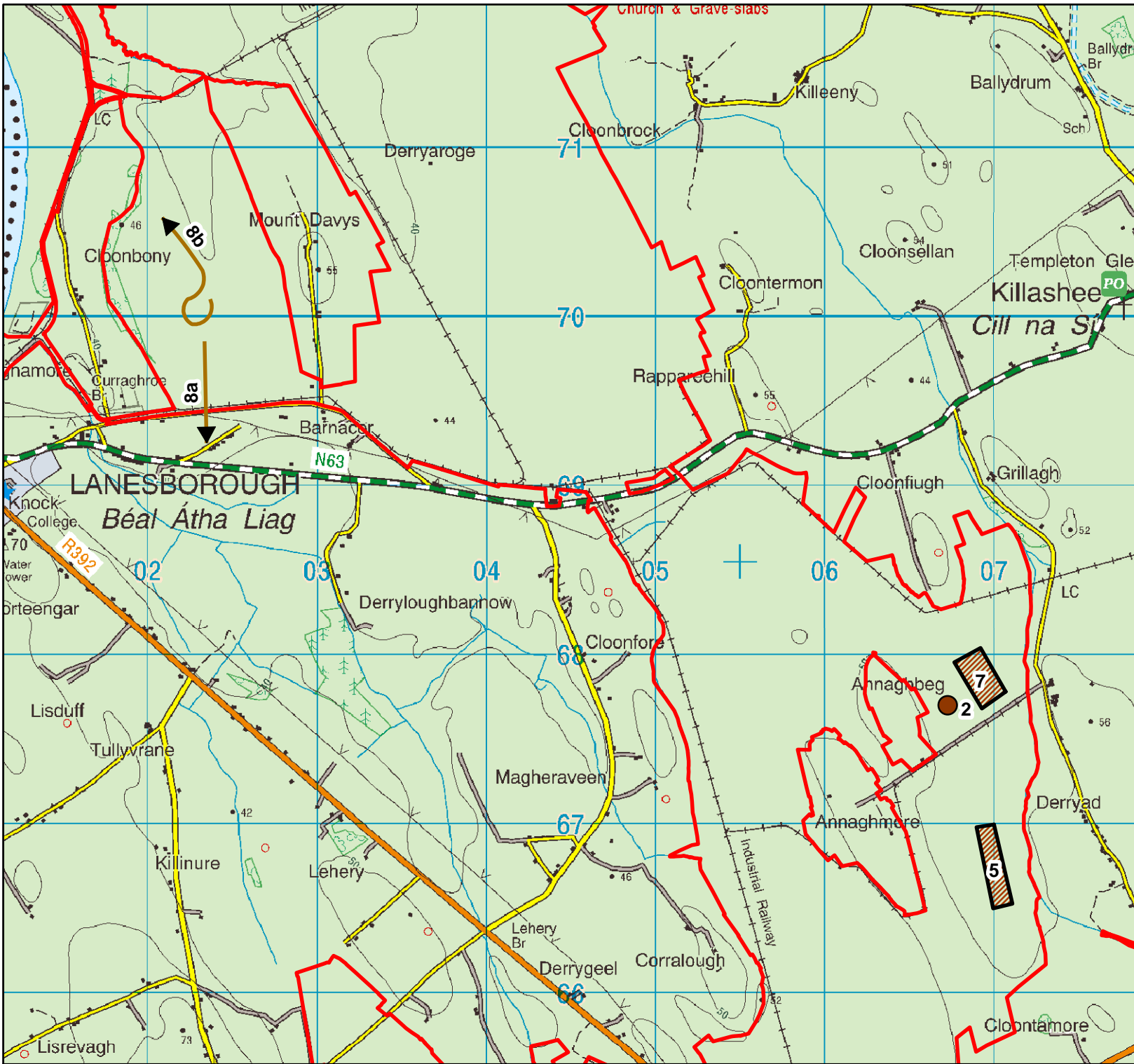
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-  Golden Plover Observation Point
 -  Golden Plover Flight Paths
 -  Golden Plover Observation Area
 -  Summer Bird Survey Area



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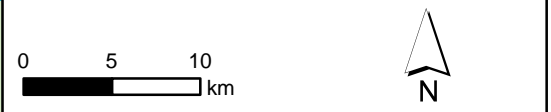
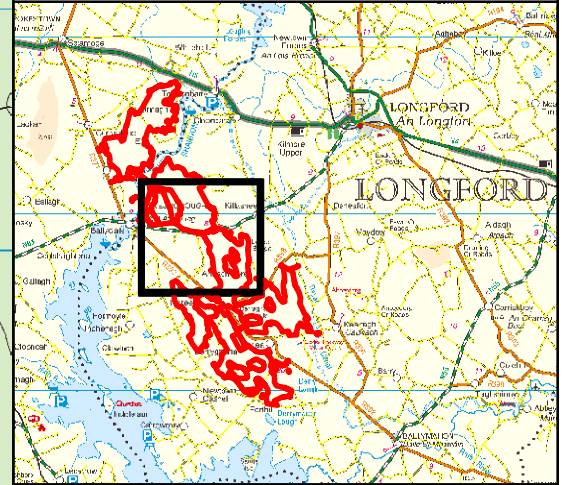
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Golden Plover Observations 2 of 4

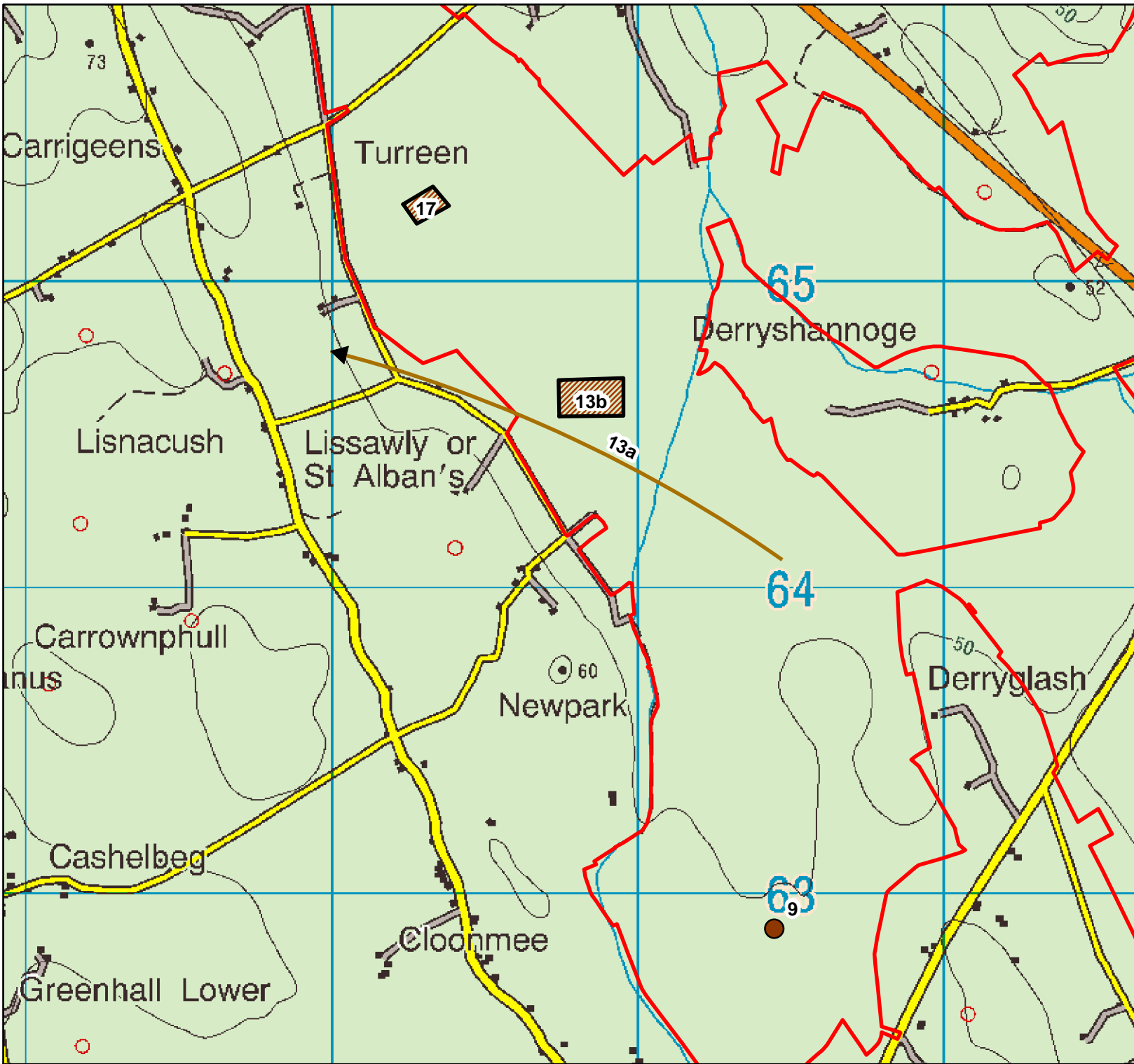
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- Golden Plover Observation Point
 - Golden Plover Flight Paths
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 - Summer Bird Survey Area



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Bord na Mona Bird Survey

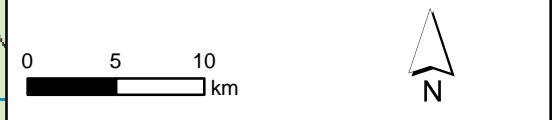
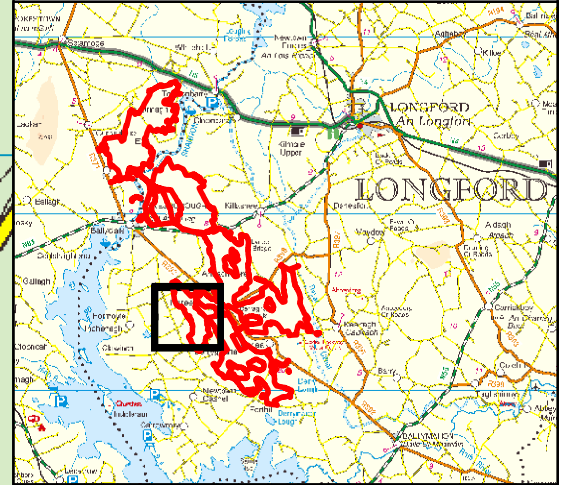
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Golden Plover Observations 3 of 4

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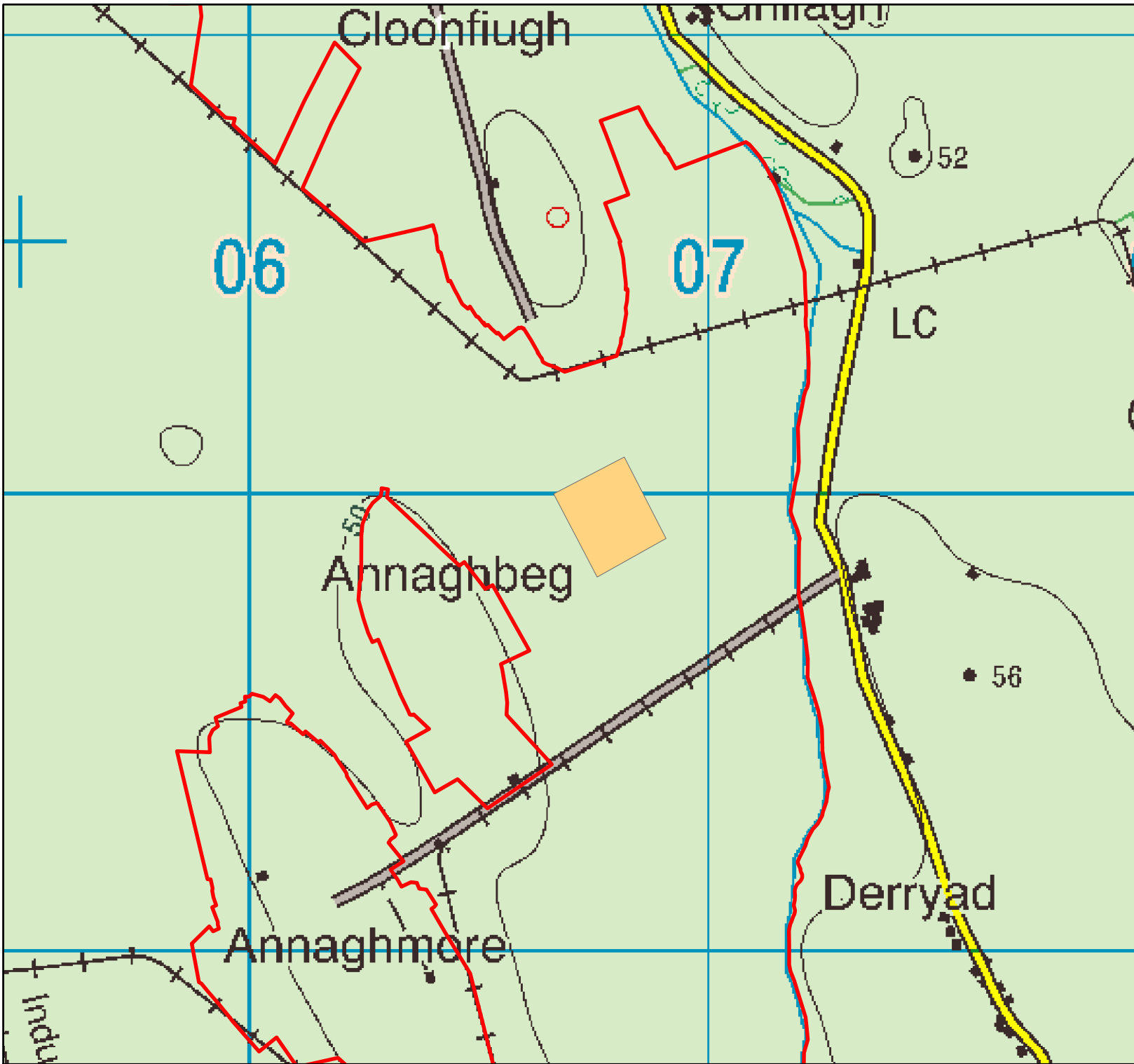
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-  Golden Plover Flight Paths
-  Golden Plover Observation Area
-  Summer Bird Survey Area



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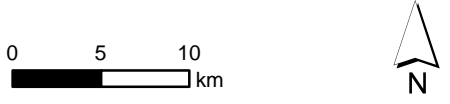
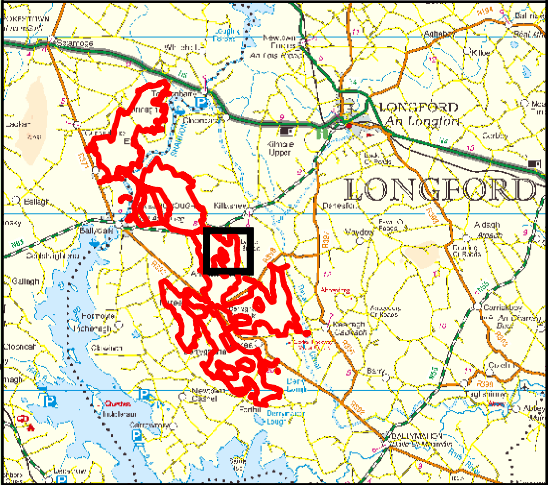
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Bord na Mona Bird Survey

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Winter 2015-2016 Bird Survey
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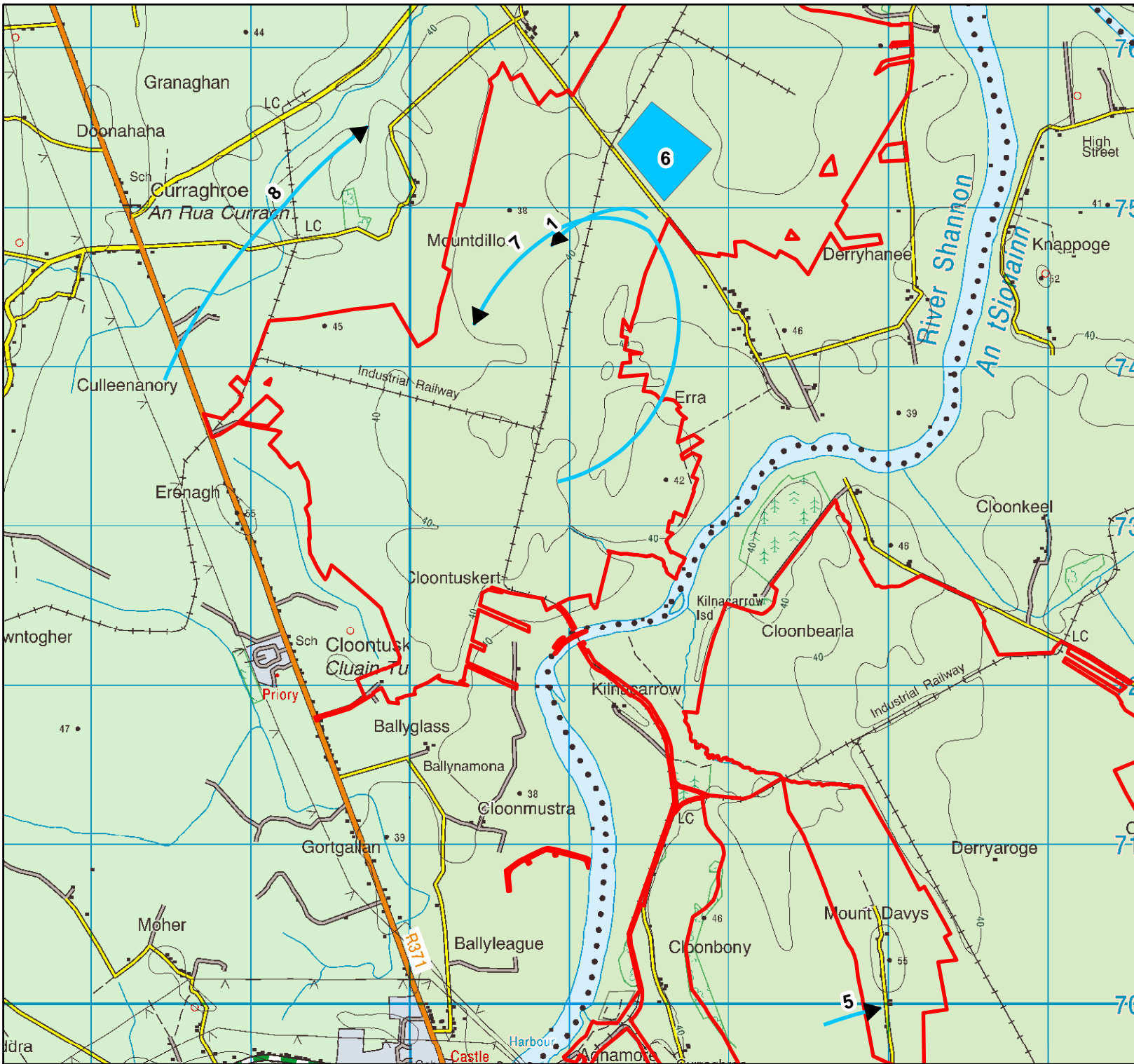
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Drawing Size: A4

- Legend
-  Greenland White-Fronted Goose Observation
 -  Summer Bird Survey Area



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Bord na Mona Bird Survey

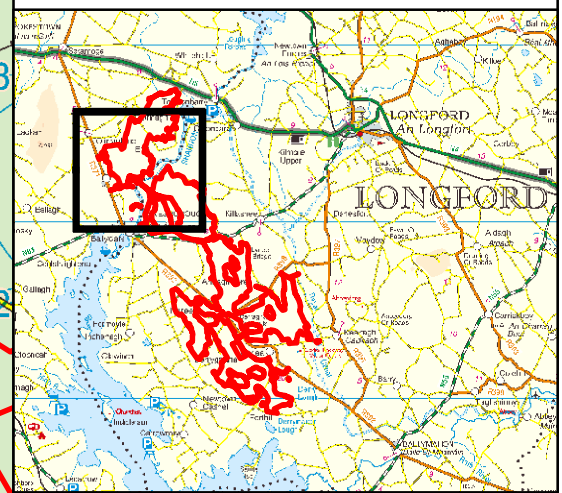
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Winter 2015-2016 Bird Survey
Grey Heron Observations - 1 of 2

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4



Legend

-  Grey Heron Flight Path
-  Grey Heron Observation
-  Summer Bird Survey Area

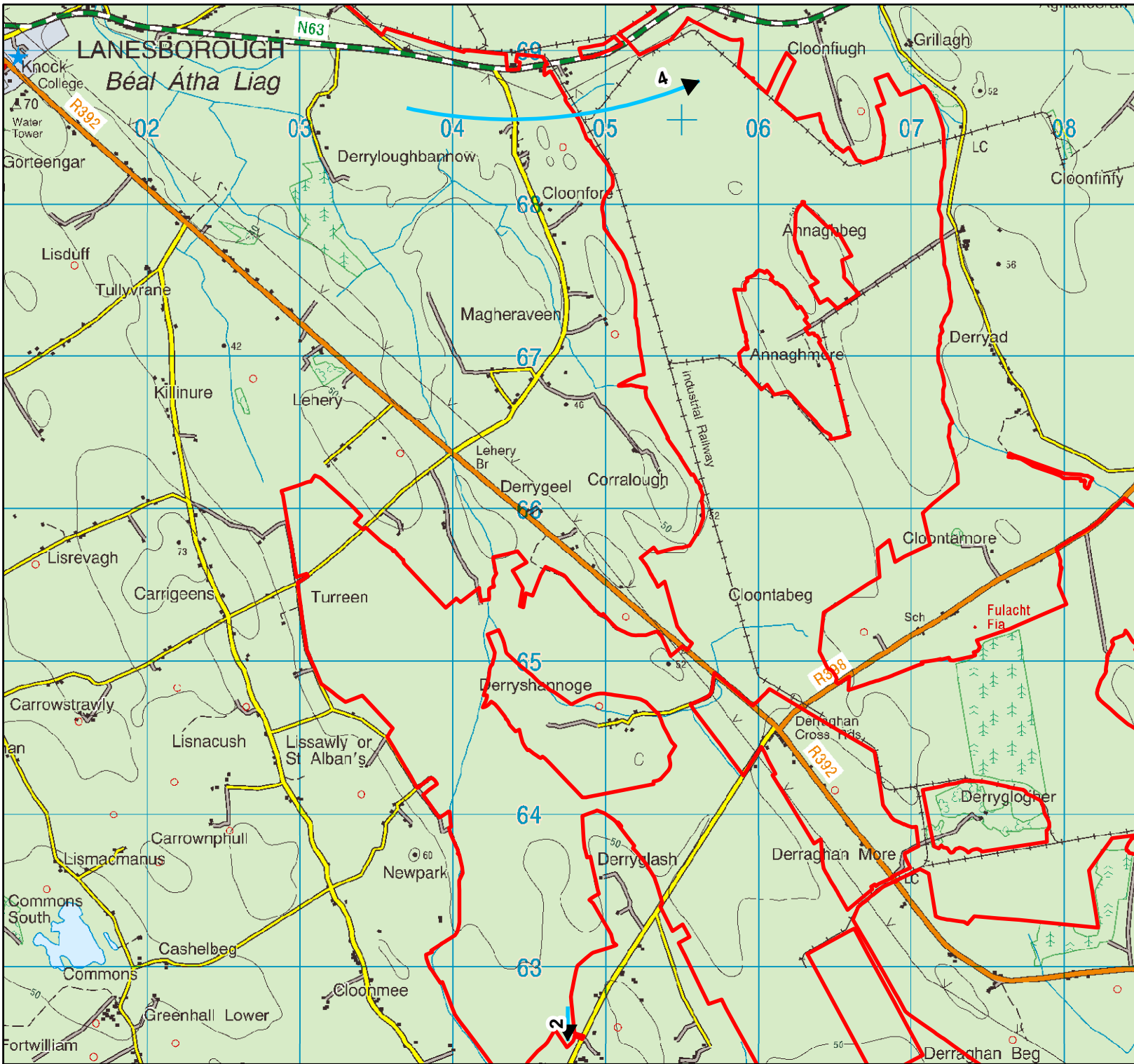


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Project Title:
Bord na Mona Bird Survey

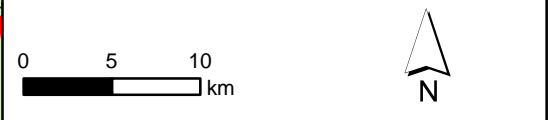
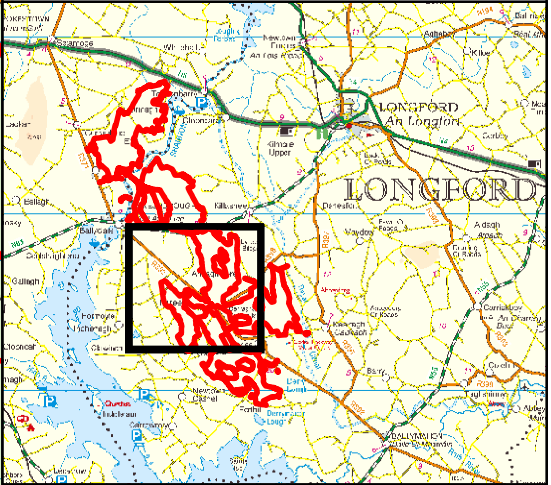
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Winter 2015-2016 Bird Survey
Grey Heron Observations - 2 of 2

Client: Bord na Mona

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Legend

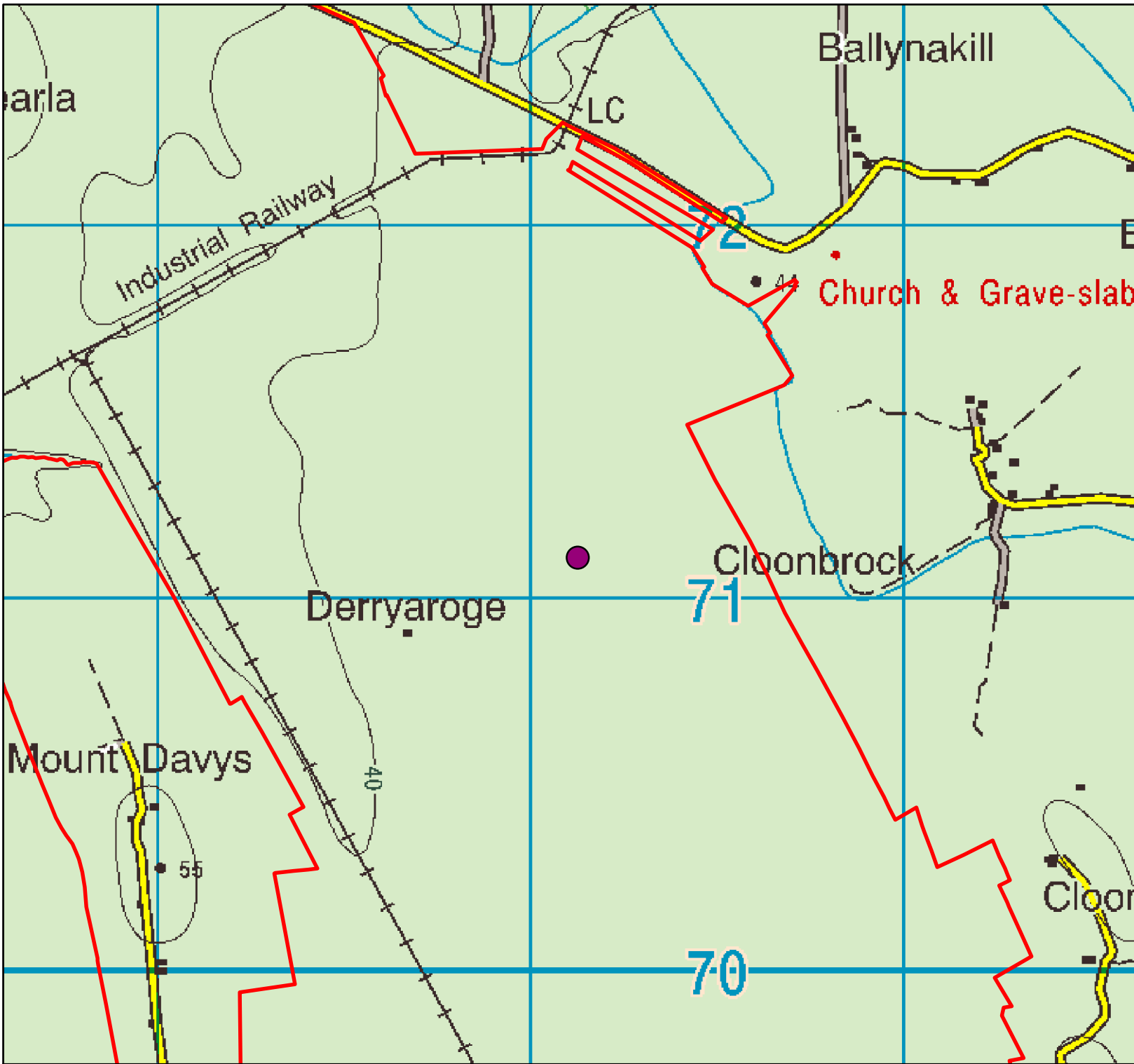
-  Grey Heron Flight Path
-  Grey Heron Observation
-  Summer Bird Survey Area



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Bord na Mona Bird Survey

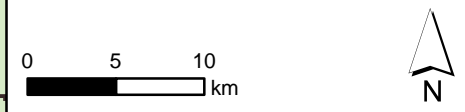
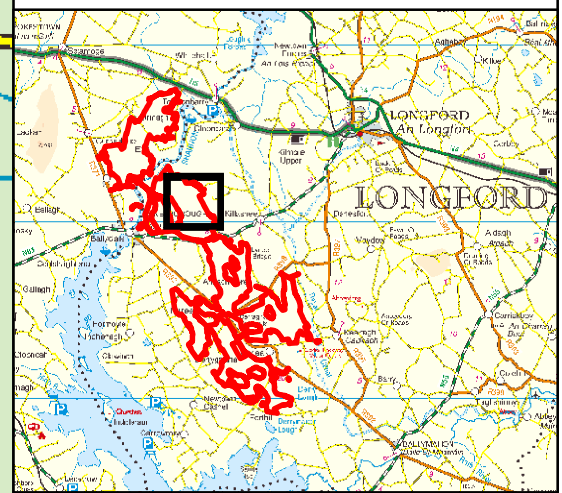
Drawing Title:
Winter 2015-2016 Bird Survey
Grey Lag Goose Observation

Client: Bord na Mona

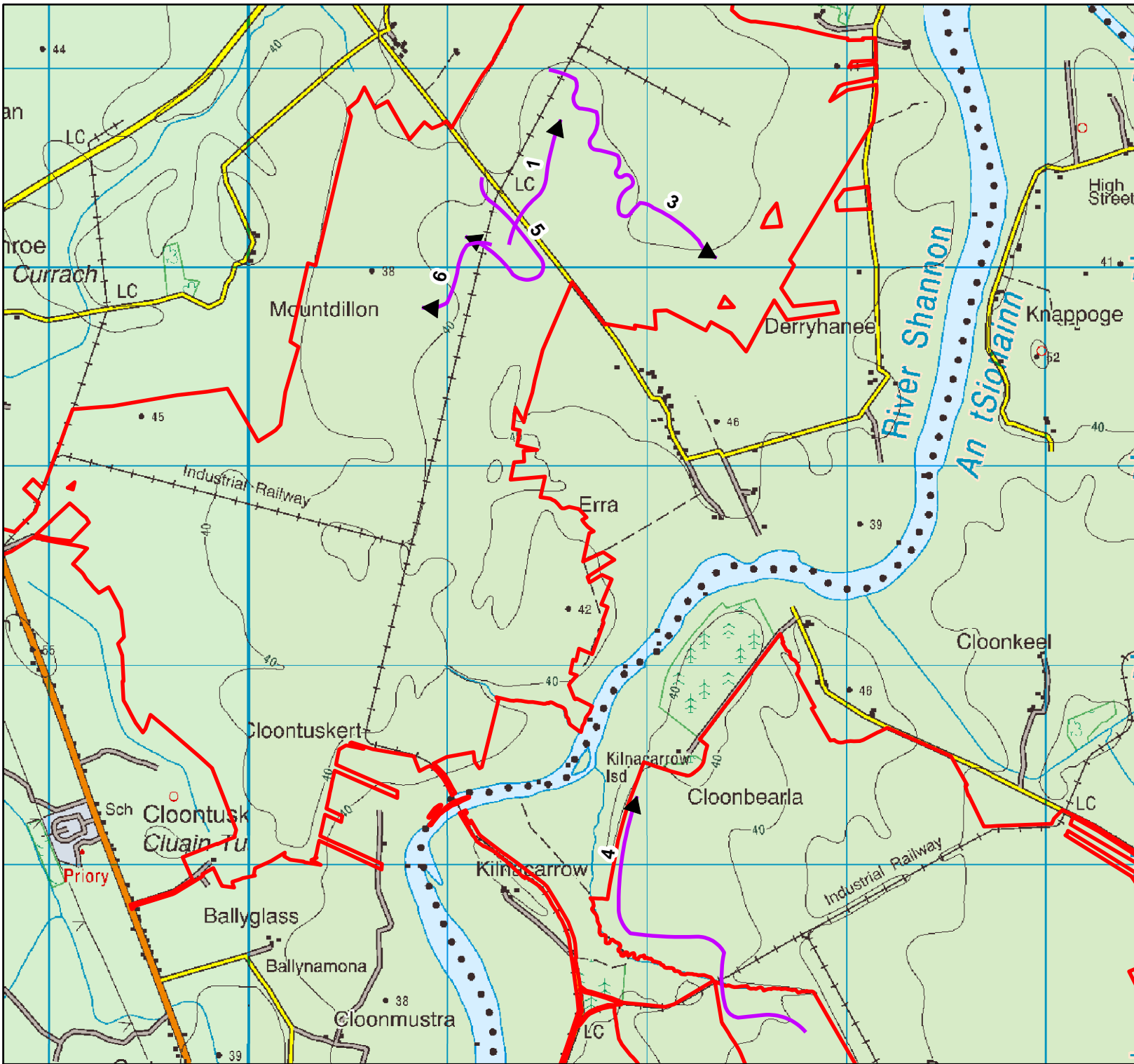
Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

- Grey Lag Goose Observation
- Summer Bird Survey Area



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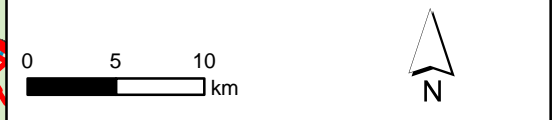
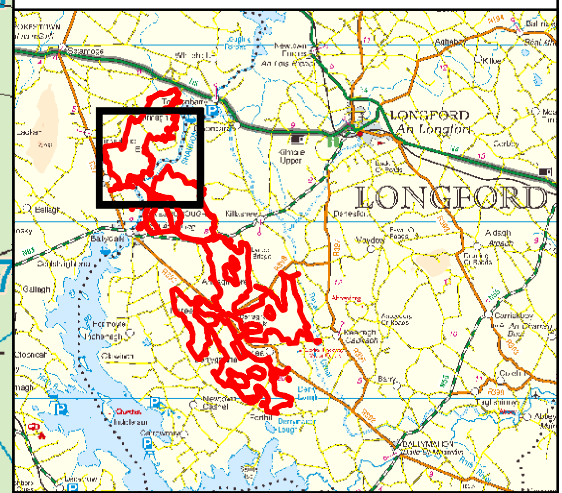
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Hen Harrier Flight Paths - 1 of 2

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

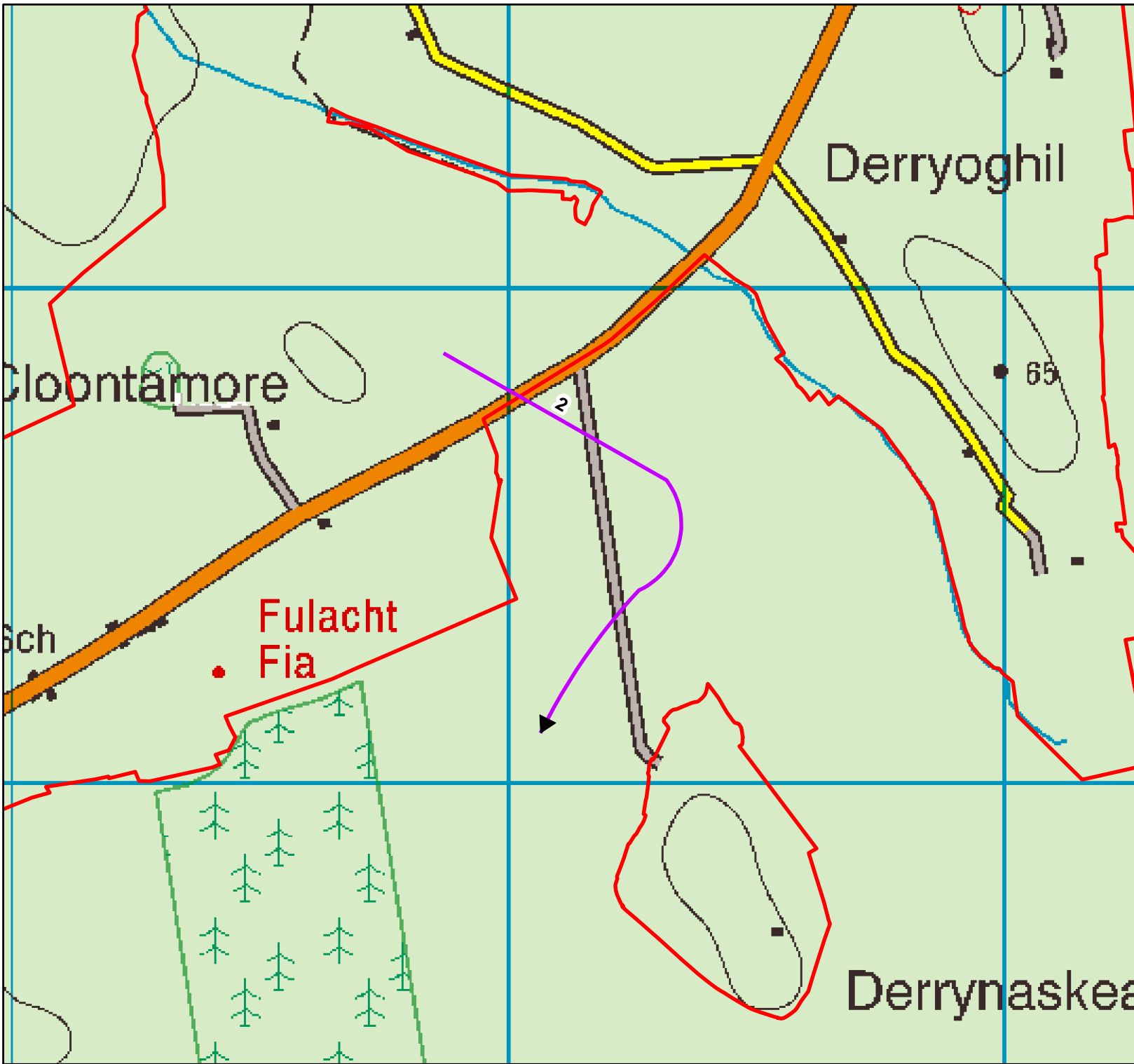
- Legend
-  Hen Harrier Flight Path
 -  Summer Bird Survey Area



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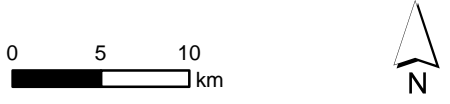
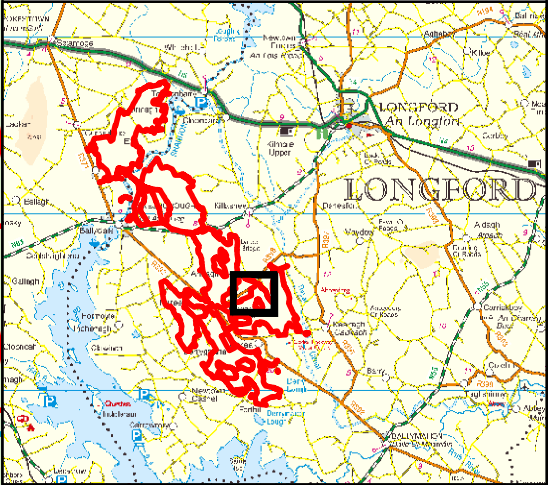
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Hen Harrier Flight Paths - 2 of 2

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

- Legend
-  Hen Harrier Flight Path
 -  Summer Bird Survey Area



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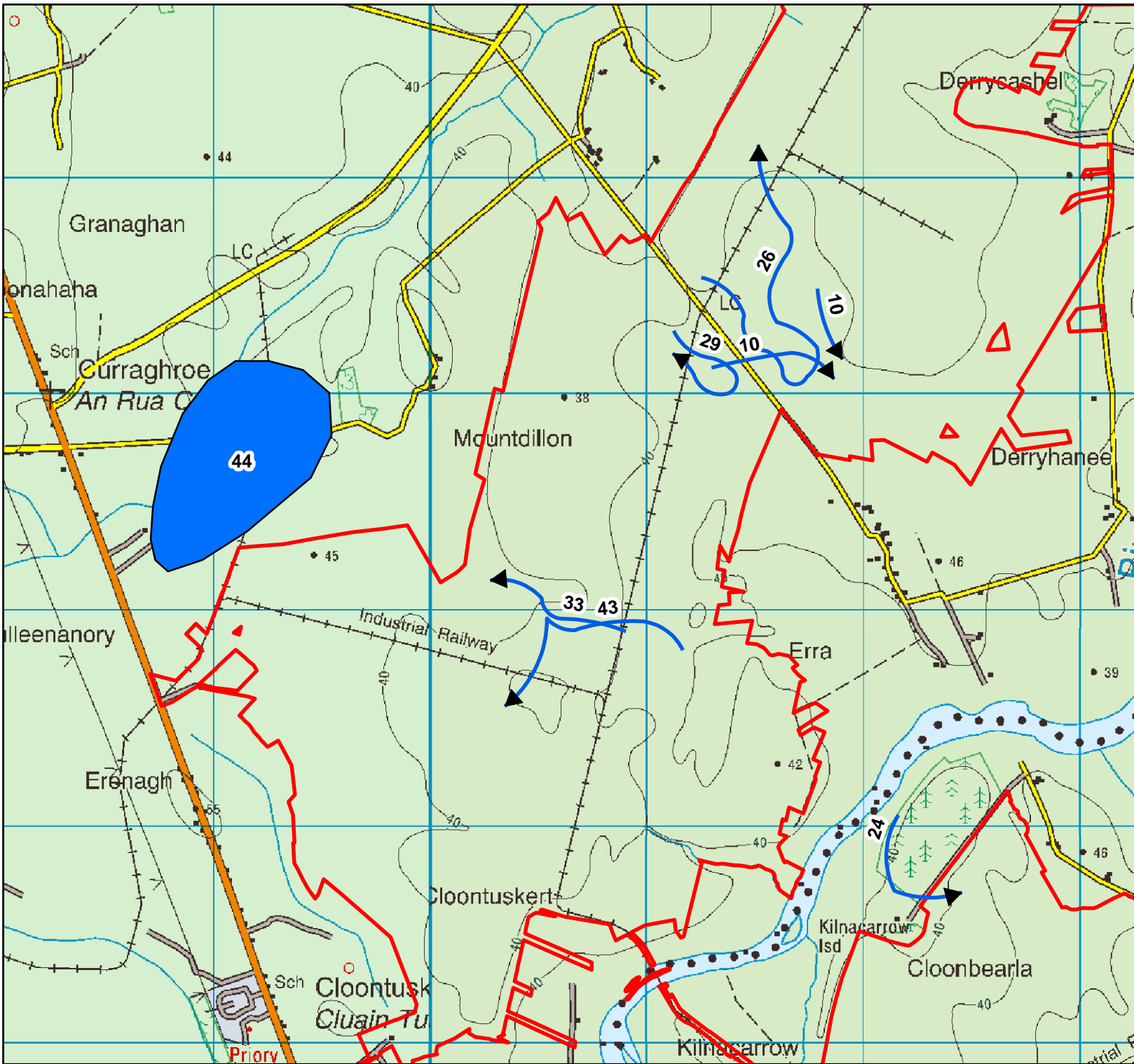
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Fulacht
Fia

Derrynaskea







Project Title:
Bord na Mona Bird Survey

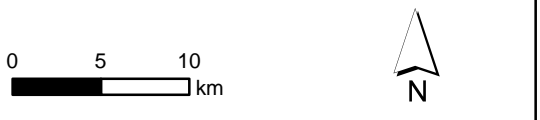
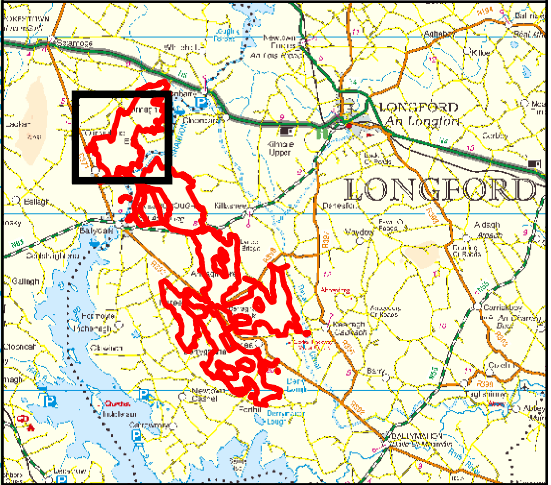
Drawing Title:
Winter 2015-2016 Bird Survey
Kestrel Observations 1 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

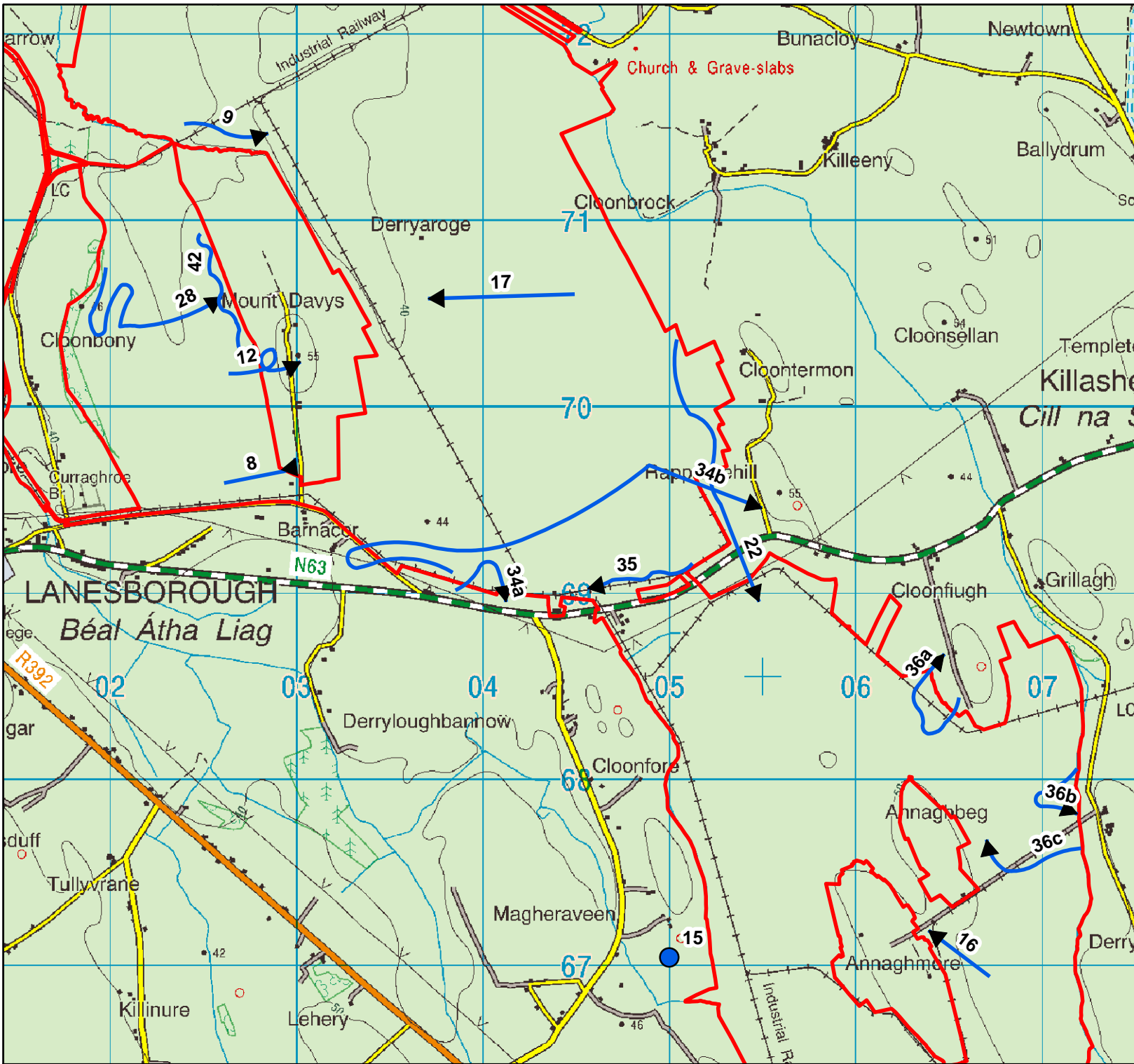
-  Kestrel Observation Point
-  Kestrel Flight Path
-  Kestrel Observation Area
-  Summer Bird Survey Area



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



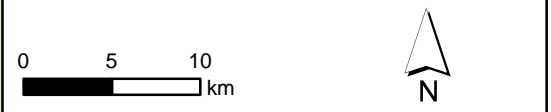
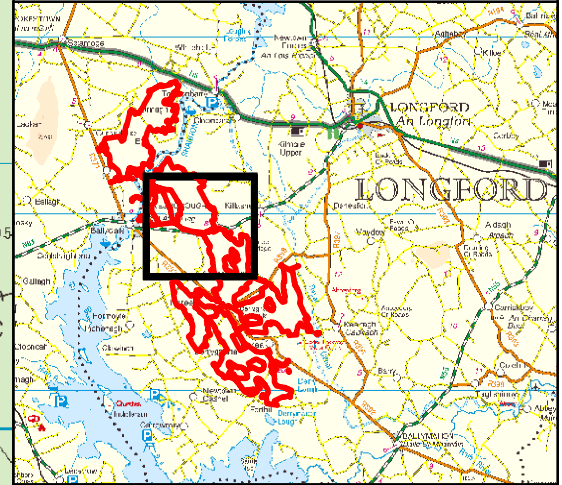
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Kestrel Observations 2 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

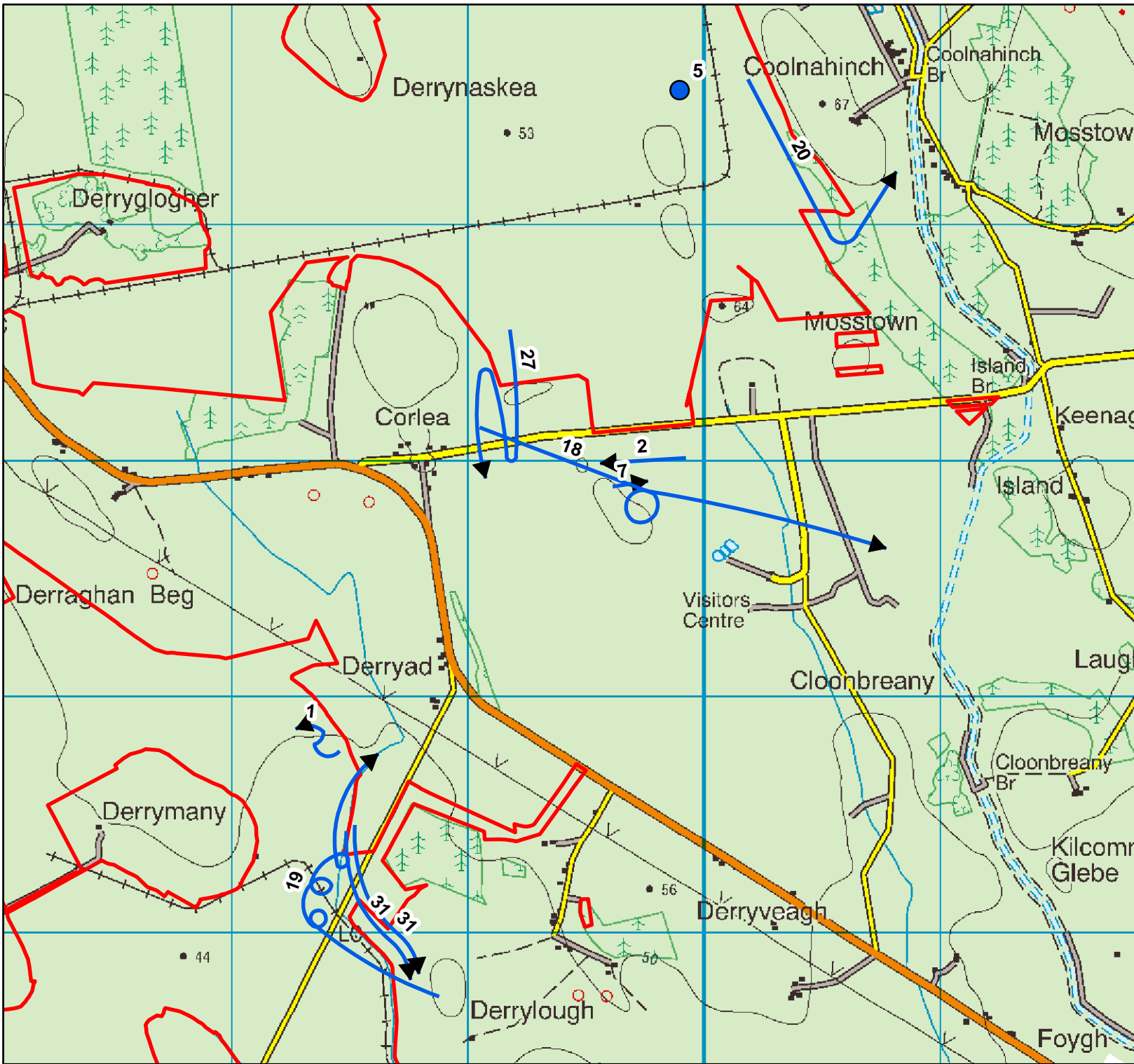
- Legend
-  Kestrel Observation Point
 -  Kestrel Flight Path
 -  Kestrel Observation Area
 -  Summer Bird Survey Area



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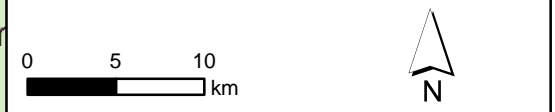
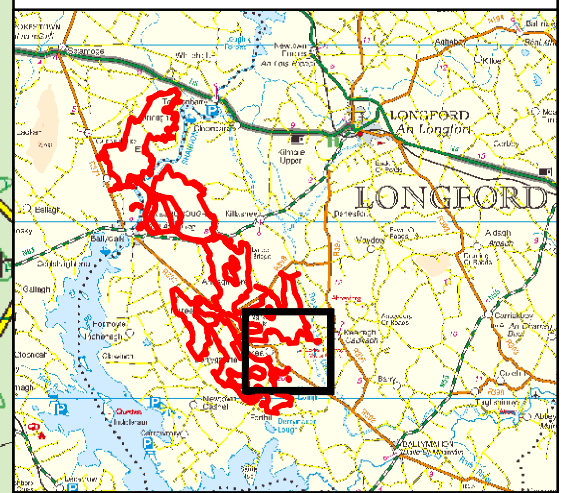
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Kestrel Observations 4 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

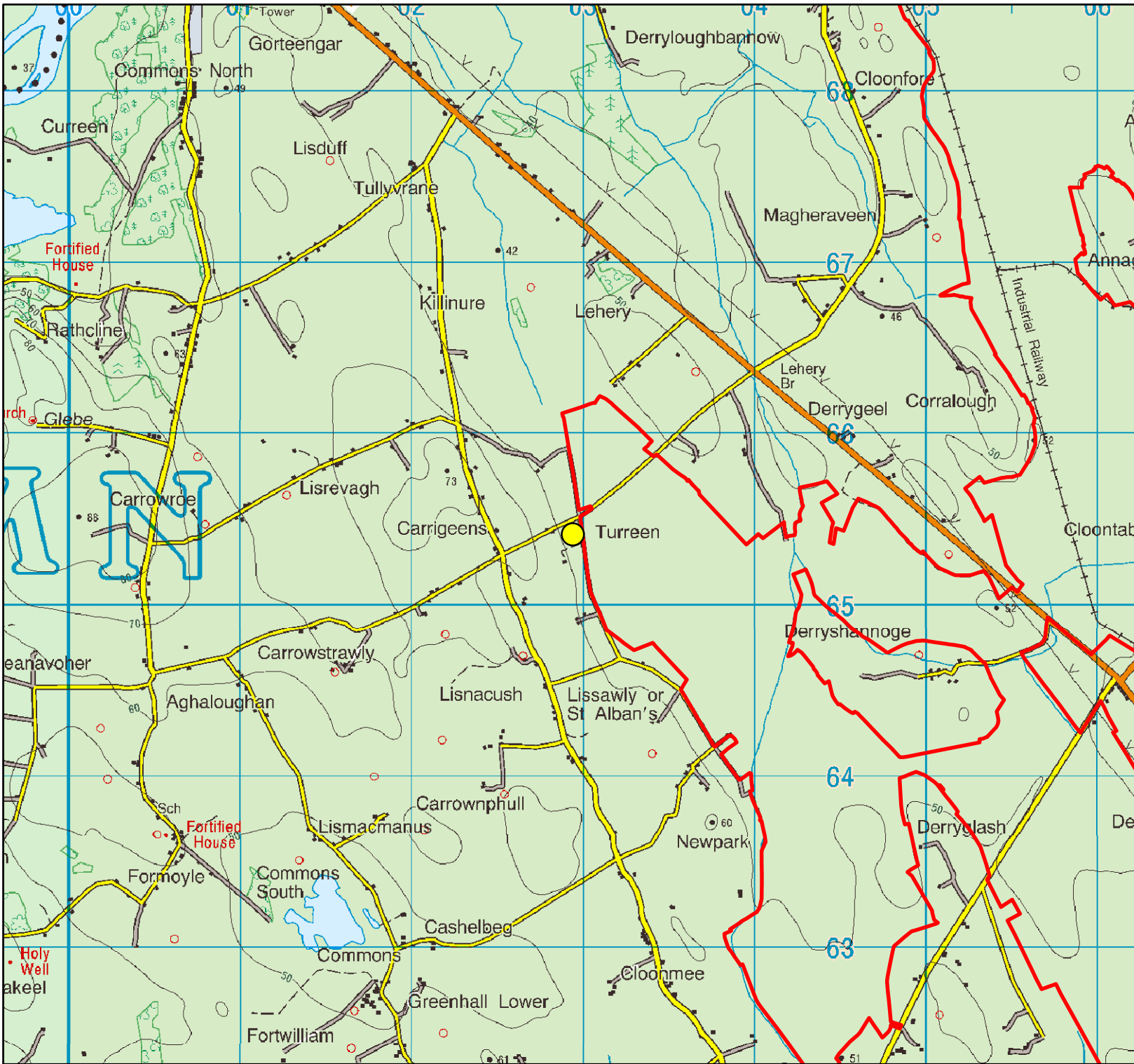
- Legend
- Kestrel Observation Point
 - ▶ Kestrel Flight Path
 - Kestrel Observation Area
 - Summer Bird Survey Area



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Project Title:
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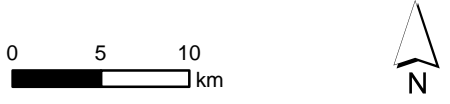
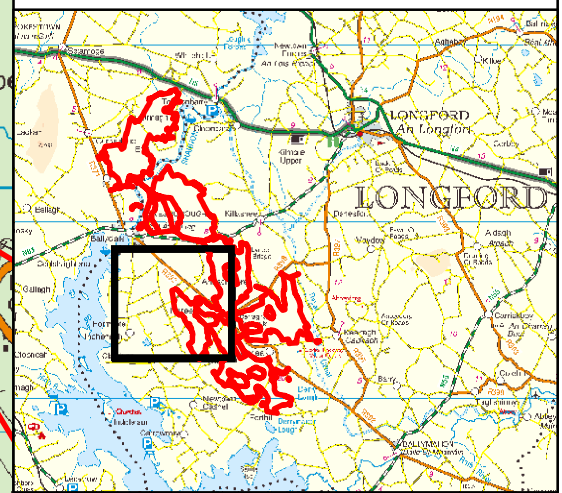
Drawing Title:
Winter 2015-2016 Bird Survey
Kingfisher Observation

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

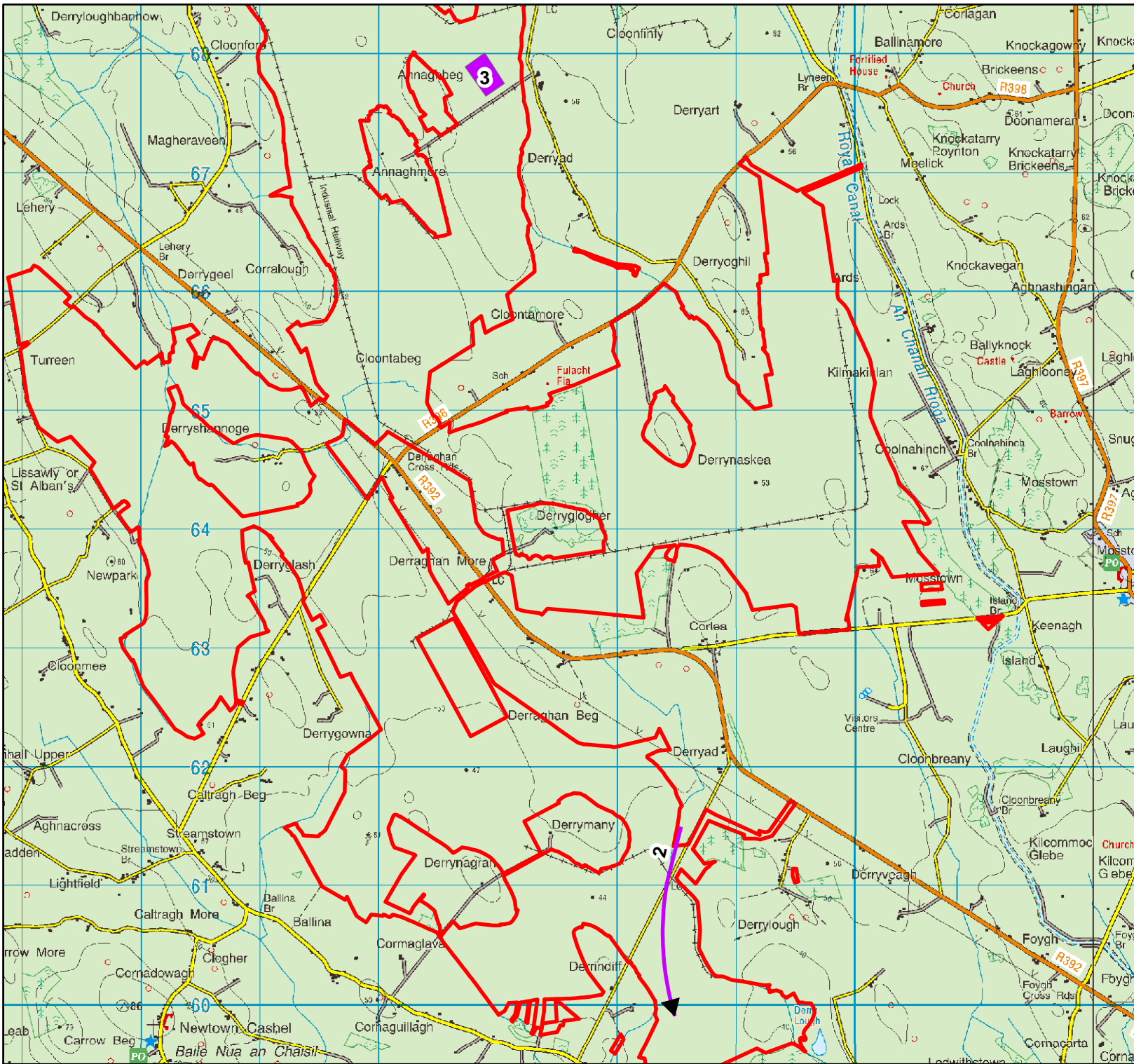
-  Kingfisher Observation Point
-  Summer Bird Survey Area



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Bord na Mona Bird Survey

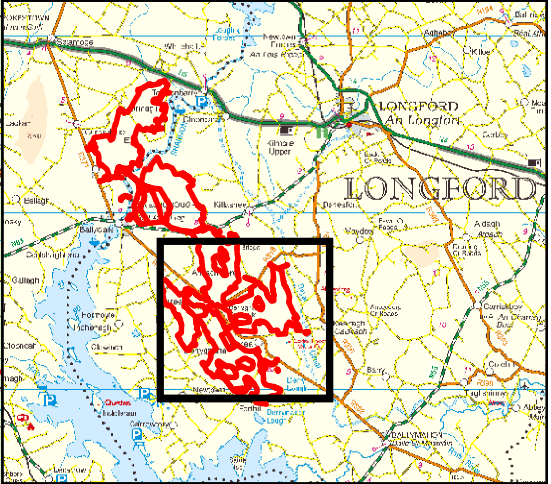
Drawing Title:
Winter 2015-2016 Bird Survey
Lapwing Observations

Client: Bord na Mona


Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend


-  Lapwing Flight Path
-  Lapwing Observation
-  Summer Bird Survey Area



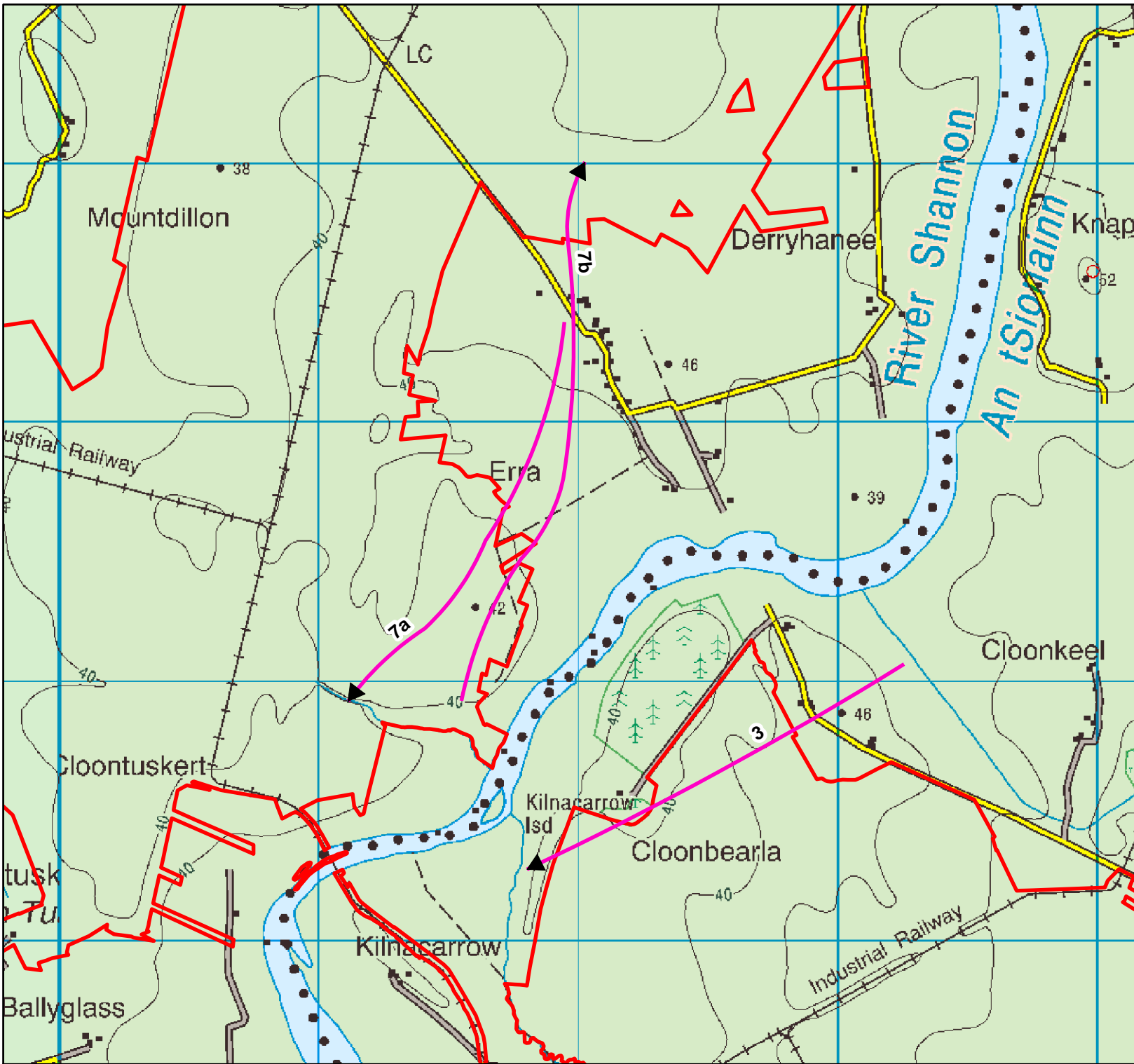
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Project Title:
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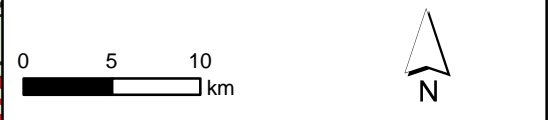
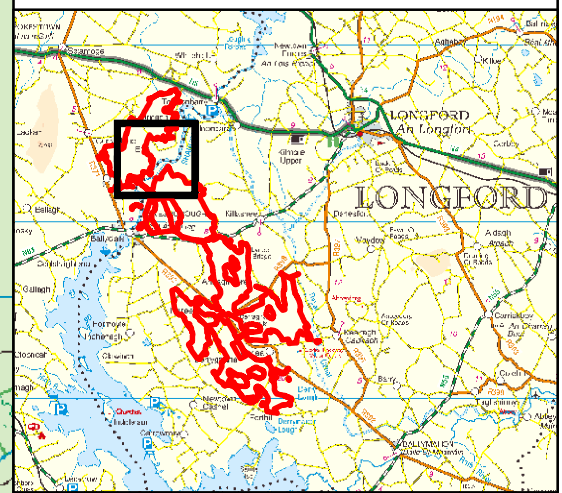
Drawing Title:
Winter 2015-2016 Bird Survey
Lesser Black-Backed Gull Flight Paths
- 1 of 3

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

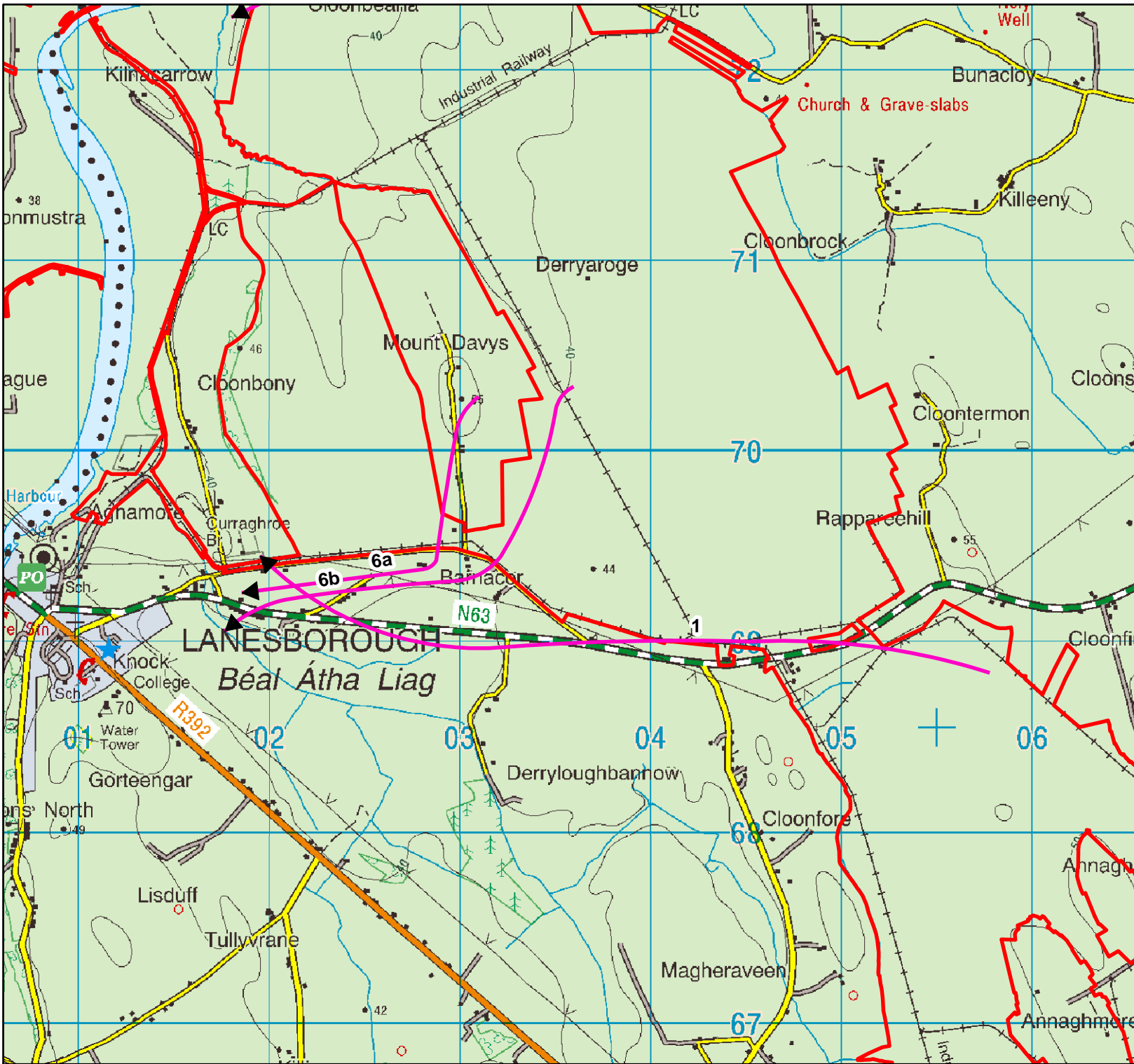
-  Lesser Black-Backed Gull Flight Path
-  Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

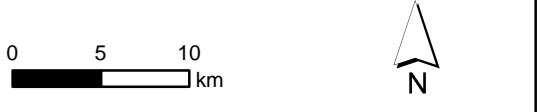
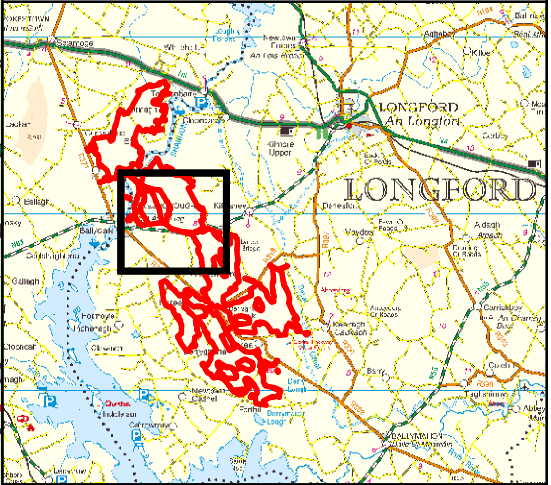
Drawing Title:
Winter 2015-2016 Bird Survey
Lesser Black-Backed Gull Flight Paths
- 2 of 3

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

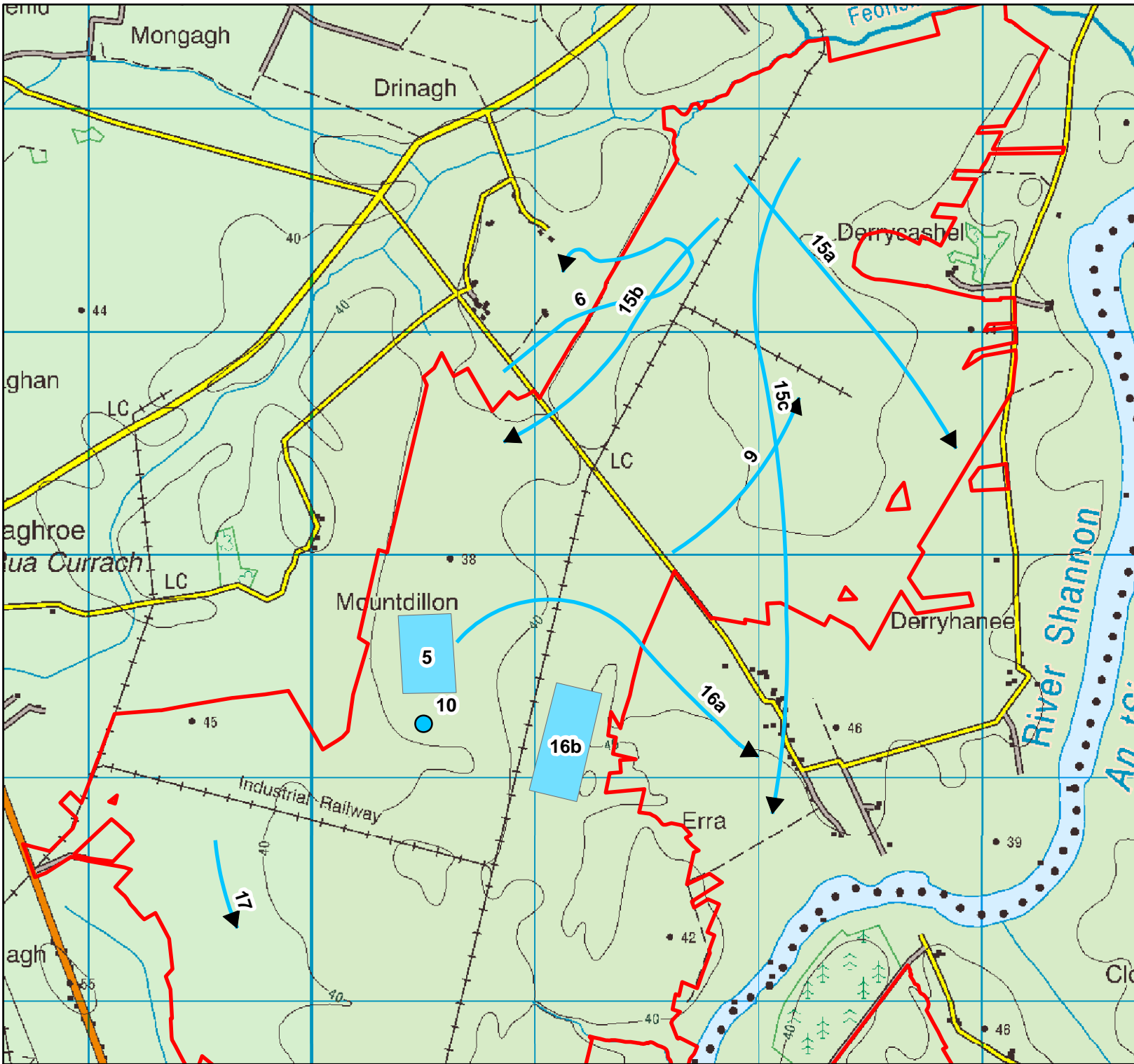
-  Lesser Black-Backed Gull Flight Path
-  Summer Bird Survey Area



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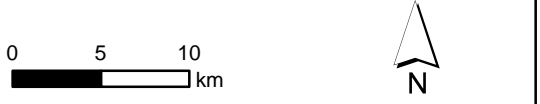
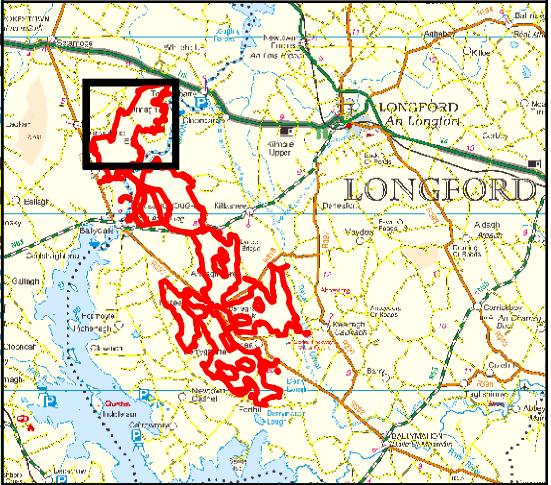
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Mallard Flight Paths & Observations - 1 of 3

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

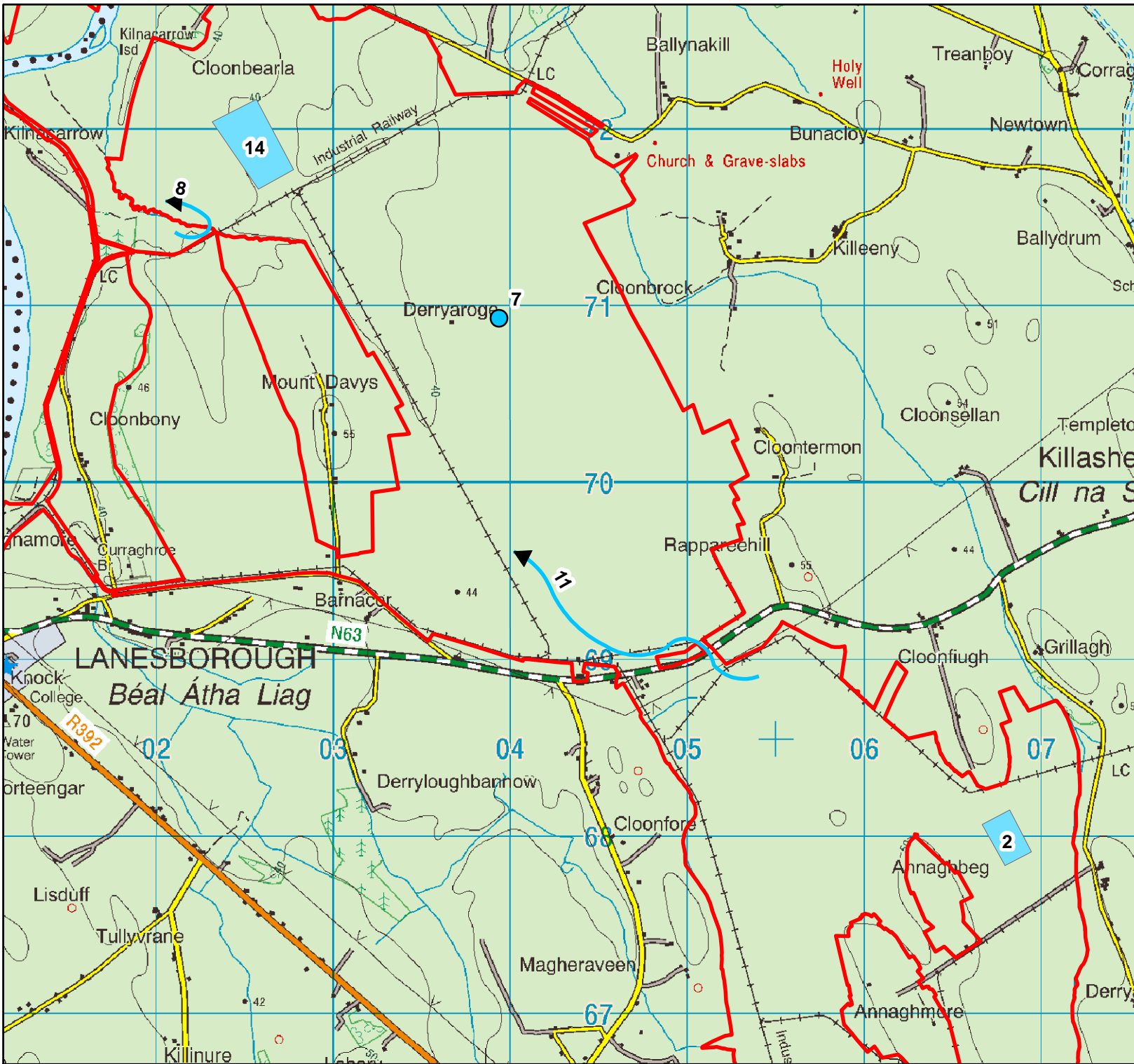
- Legend
-  Mallard Observation Point
 -  Mallard Flight Path
 -  Mallard Observation Area
 -  Summer Bird Survey Area



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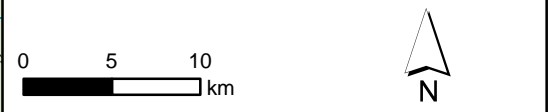
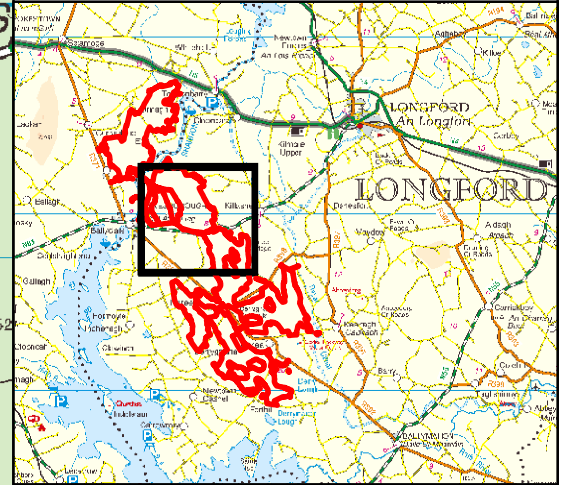
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Mallard Flight Paths & Observations - 2 of 3

Client: Bord na Mona

Drawn by: JK
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Drawing Date: 27/06/2016
Drawing Size: A4

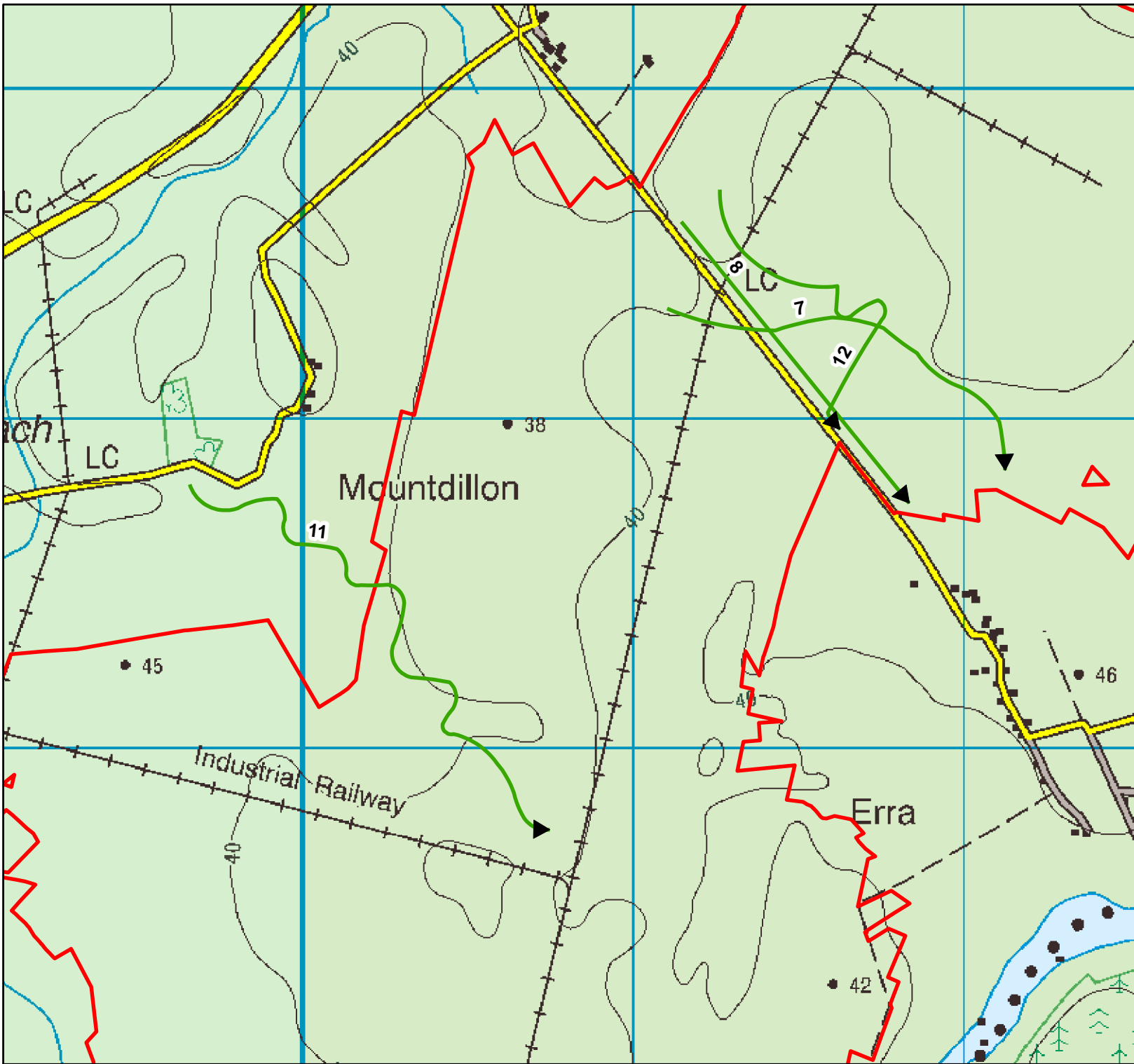
- Legend
- Mallard Observation Point
 - ▶ Mallard Flight Path
 - Mallard Observation Area
 - Summer Bird Survey Area



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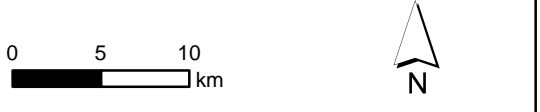
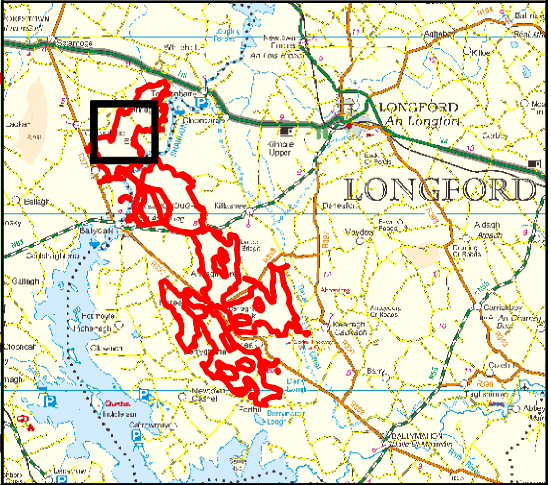
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Merlin Flight Paths & Observations - 1 of 2

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

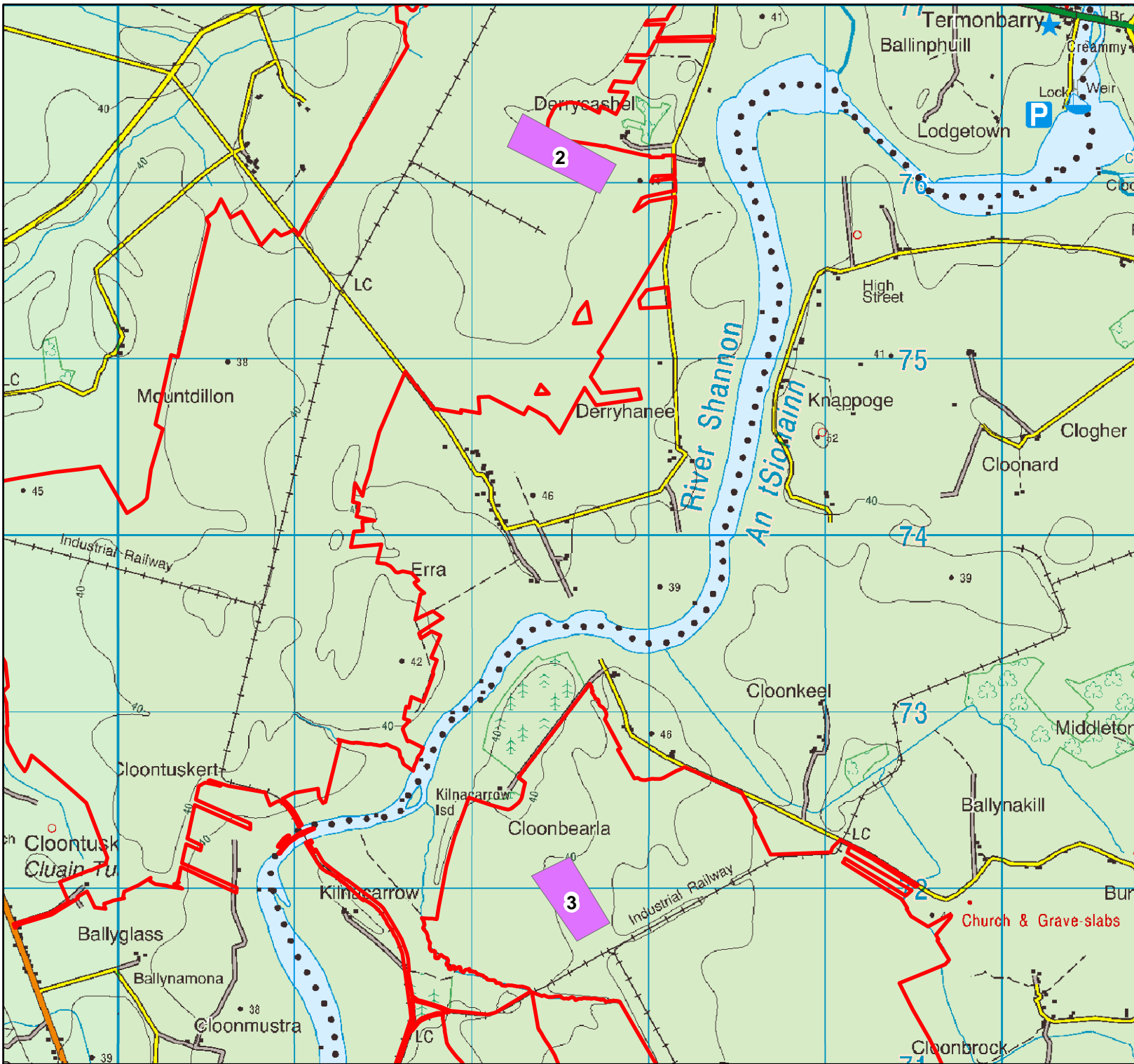
- Legend
- Merlin Observation Point
 - ▶ Merlin Flight Path
 - Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

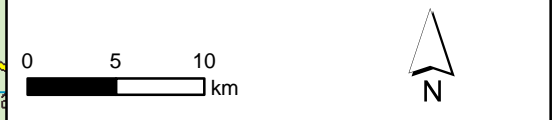
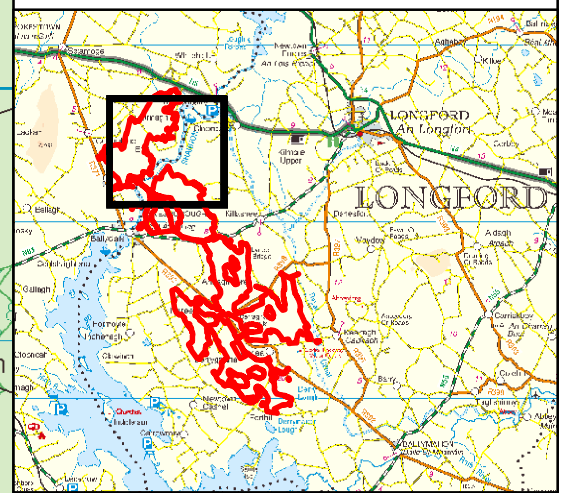
Drawing Title:
Winter 2015-2016 Bird Survey
Mute Swan Observations

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

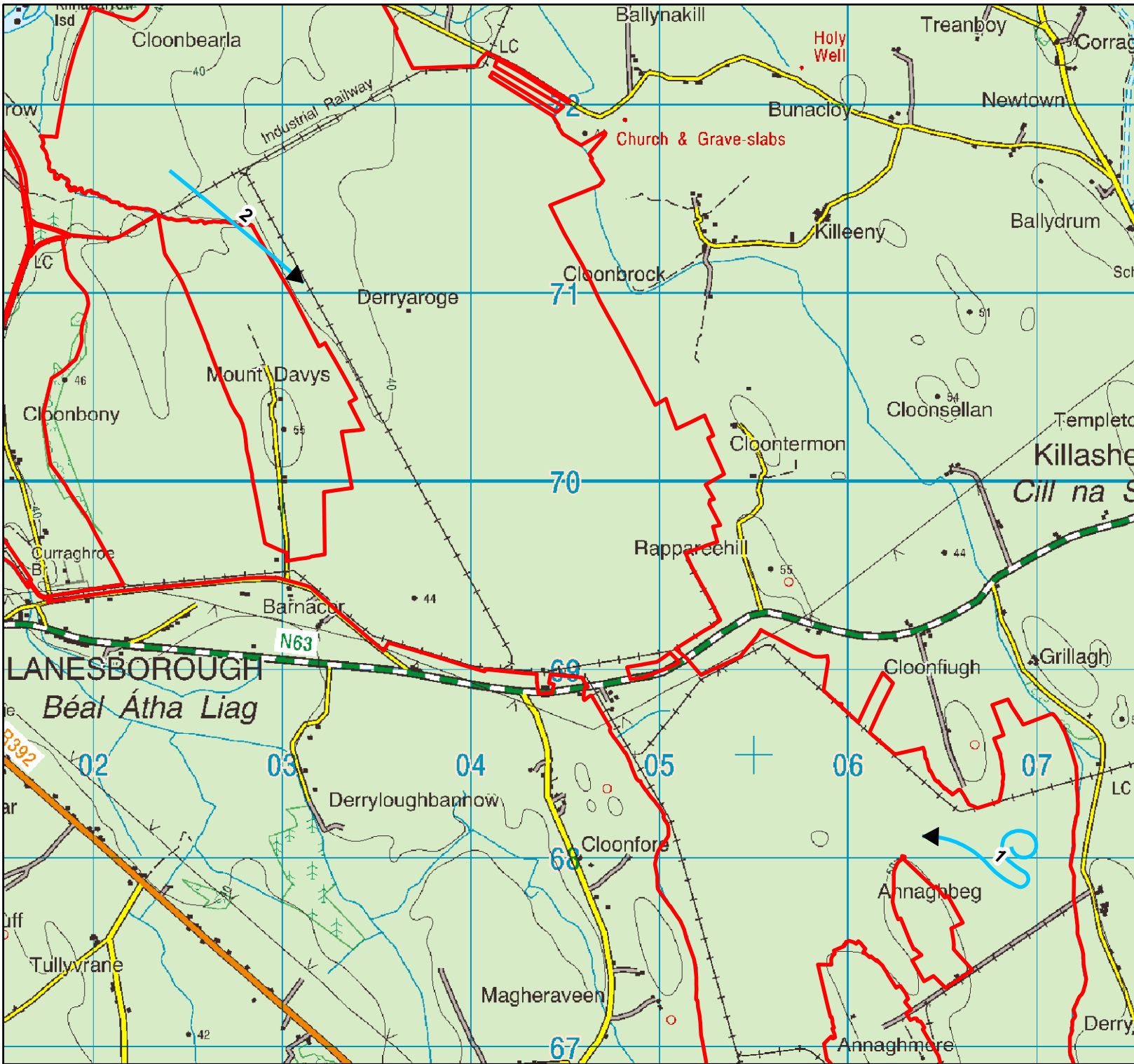
- Mute Swan Observation
- Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

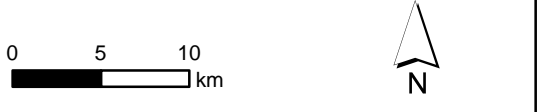
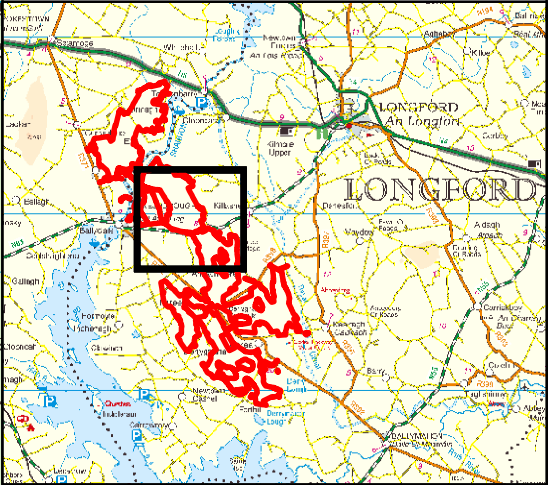
Drawing Title:
Winter 2015-2016 Bird Survey
Peregrine Flight Paths

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

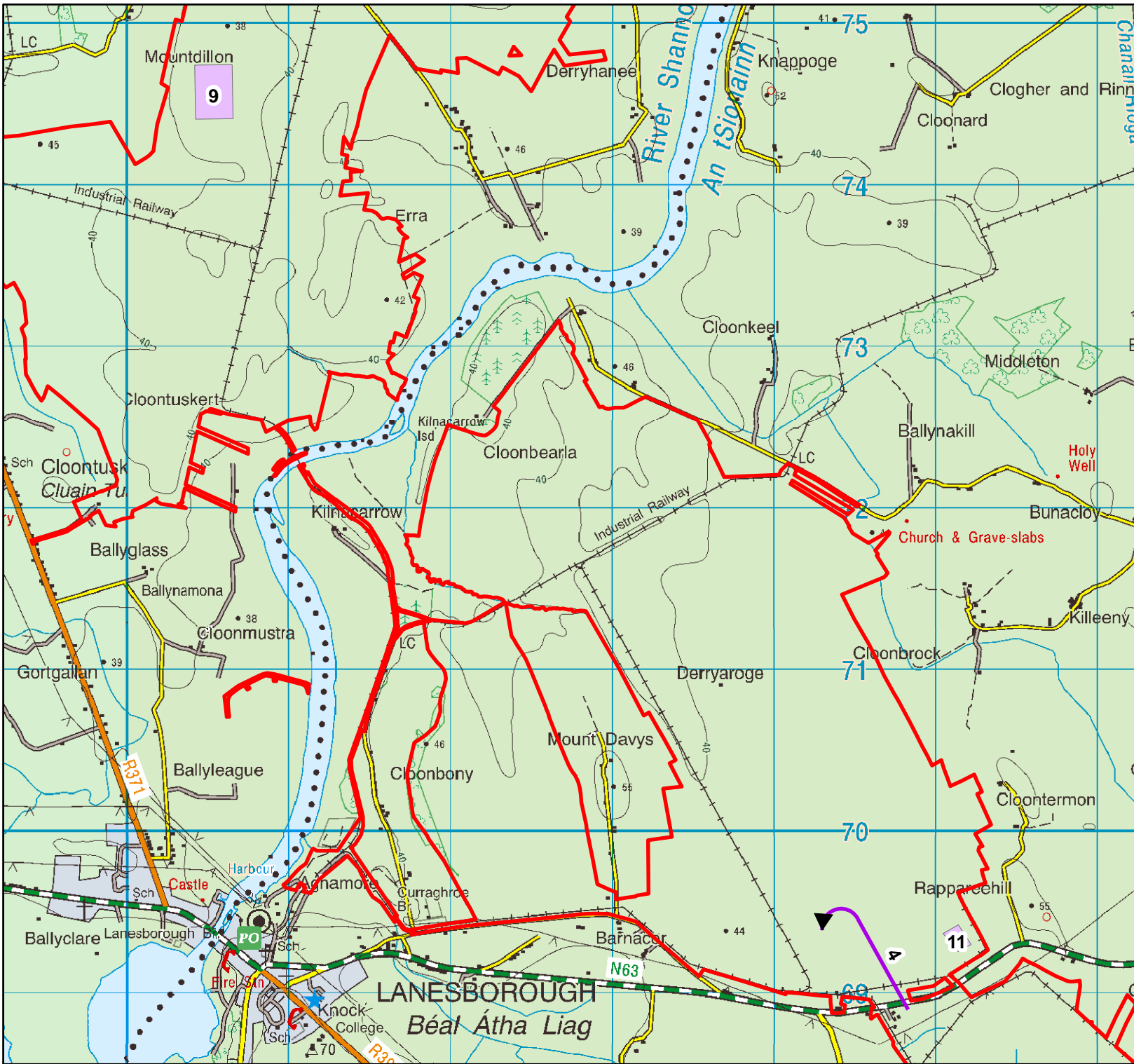
Legend

-  Peregrine Flight Path
-  Summer Bird Survey Area



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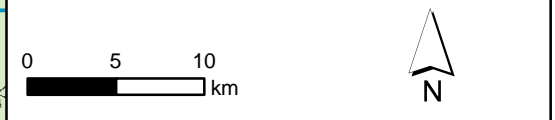
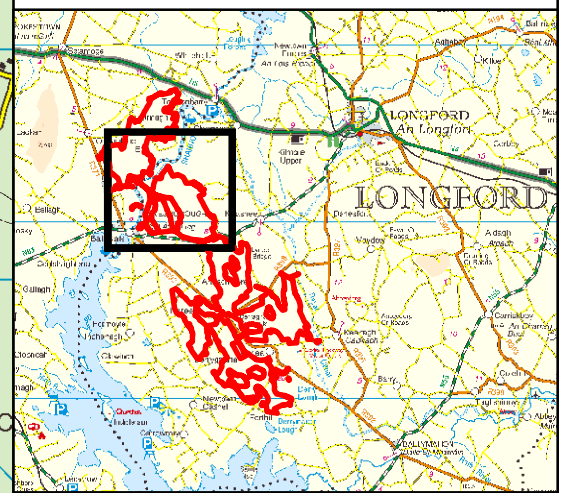
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Snipe Observations 1 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

- Legend
-  Snipe Observation Point
 -  Snipe Flight Path
 -  Snipe Observation Area
 -  Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

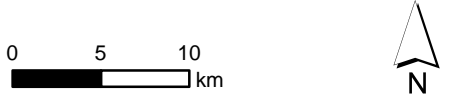
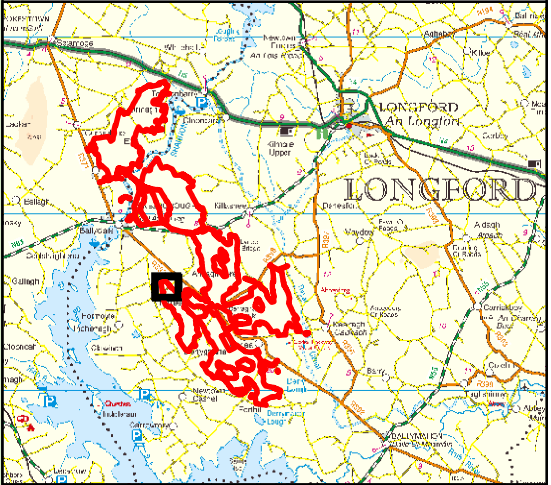
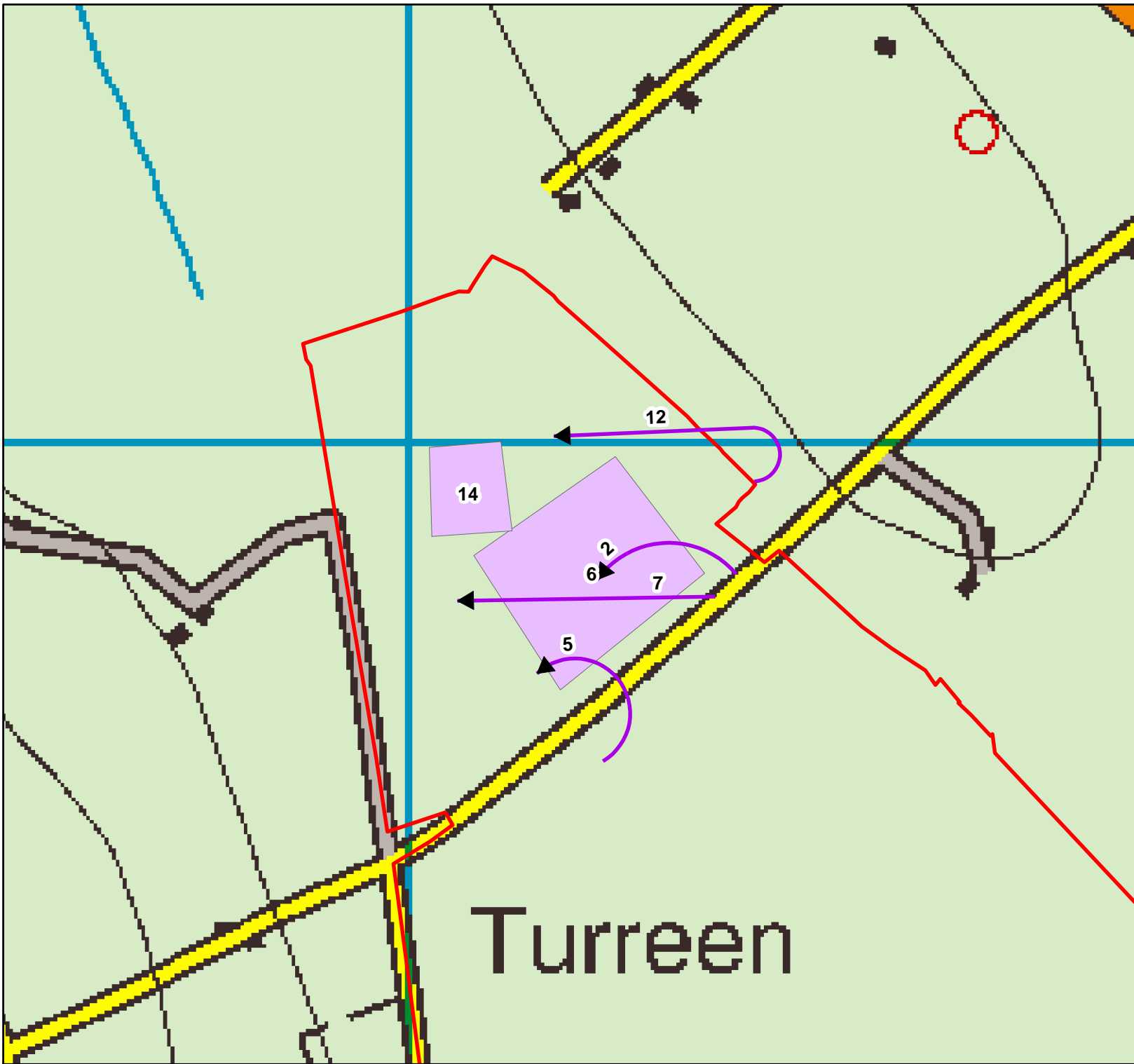
Drawing Title:
Winter 2015-2016 Bird Survey
Snipe Observations 2 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

-  Snipe Observation Point
-  Snipe Flight Path
-  Snipe Observation Area
-  Summer Bird Survey Area



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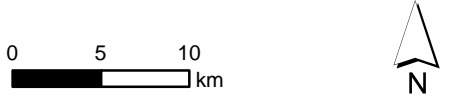
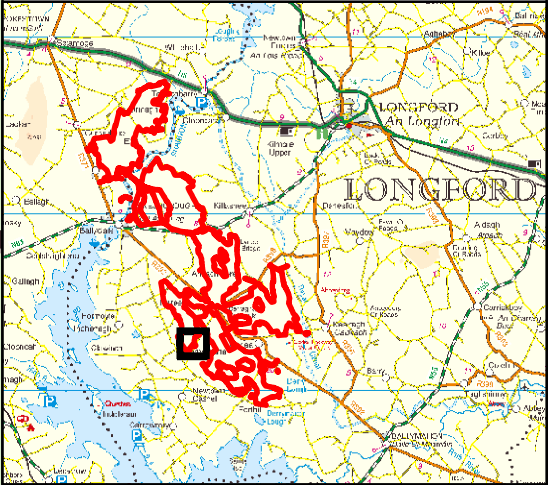
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Snipe Observations 3 of 4

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

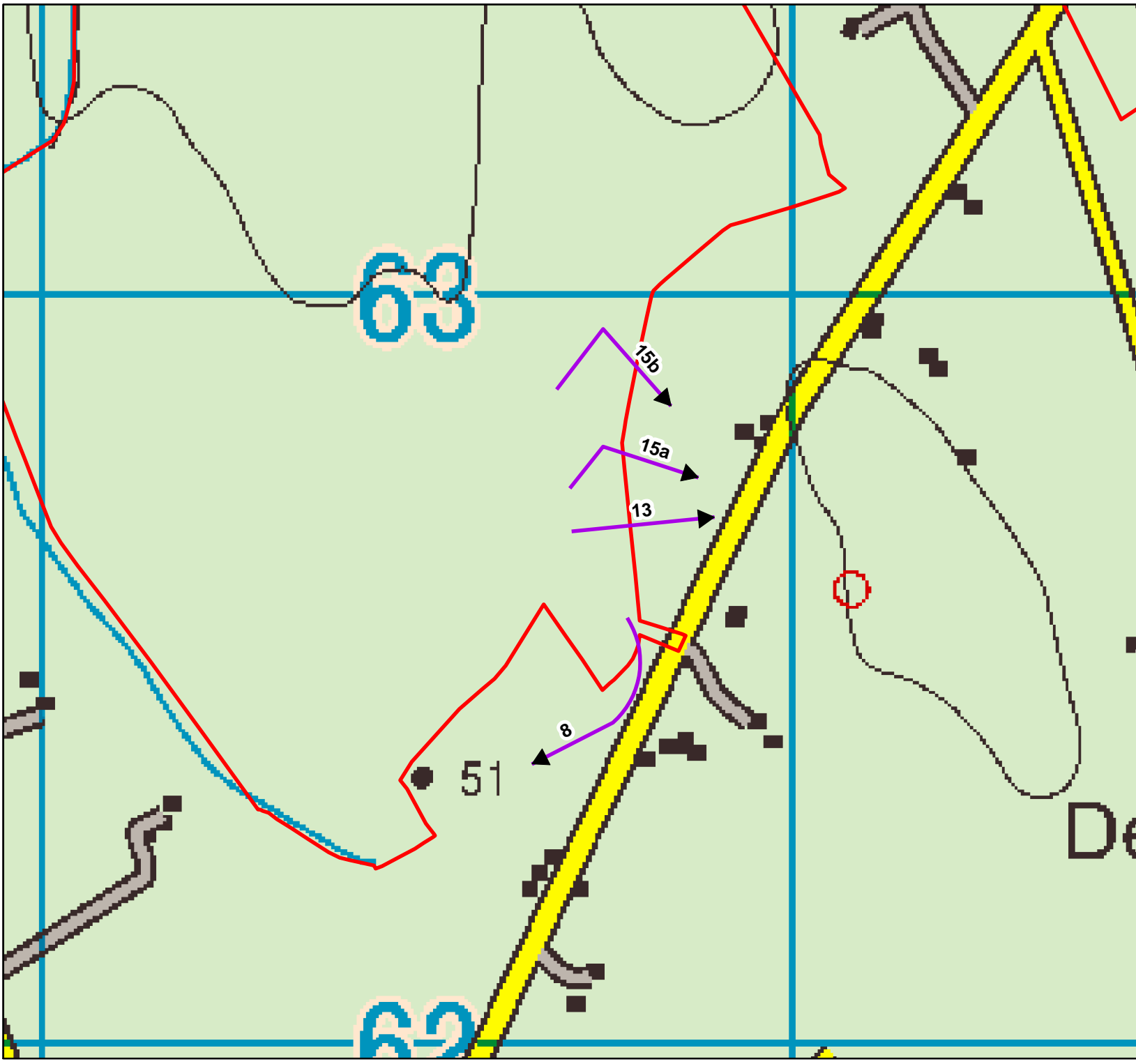
- Legend
- Snipe Observation Point
 - ➔ Snipe Flight Path
 - Snipe Observation Area
 - ▭ Summer Bird Survey Area

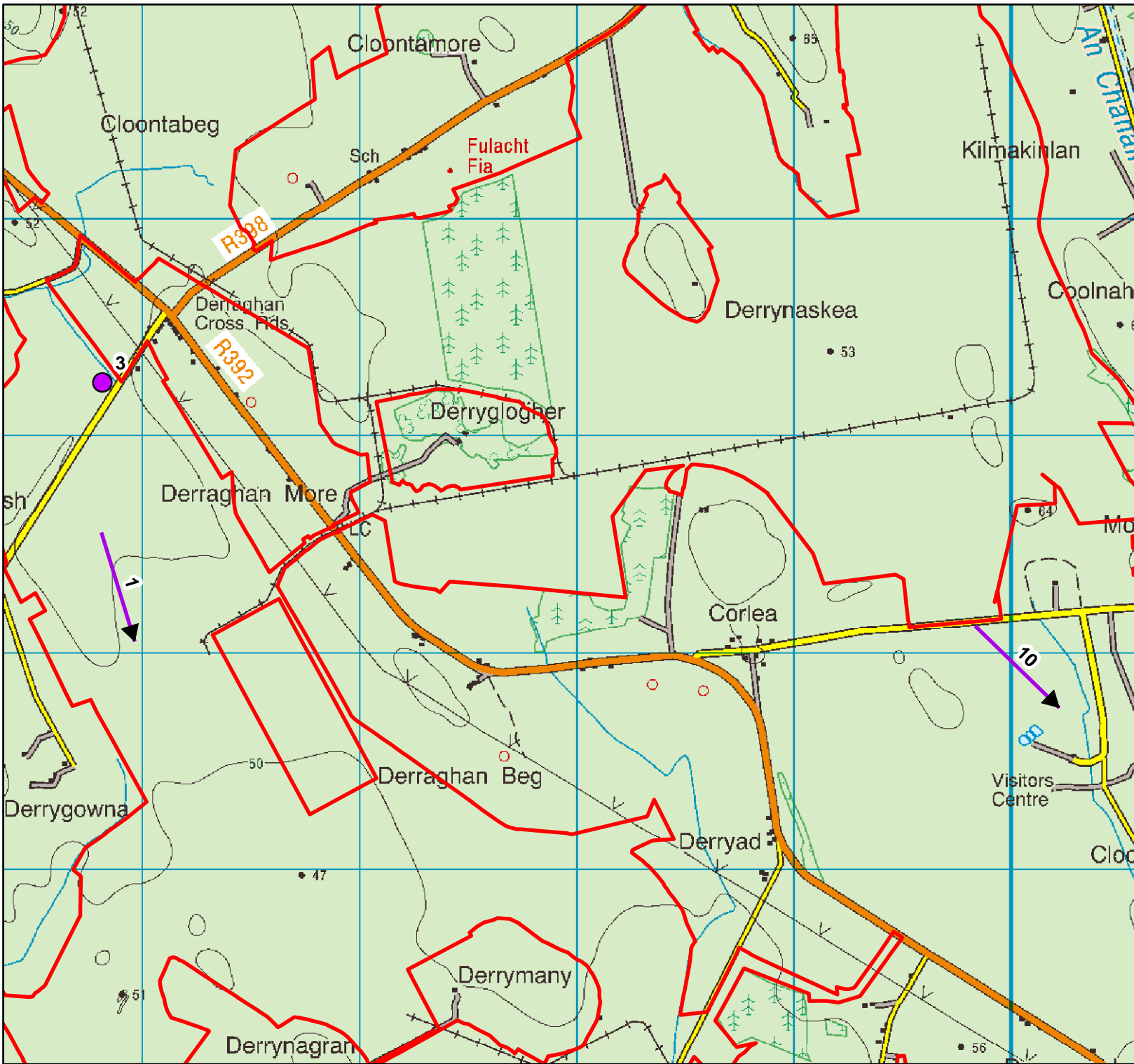


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Project Title:
Bord na Mona Bird Survey

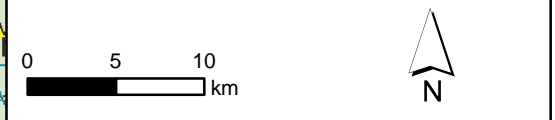
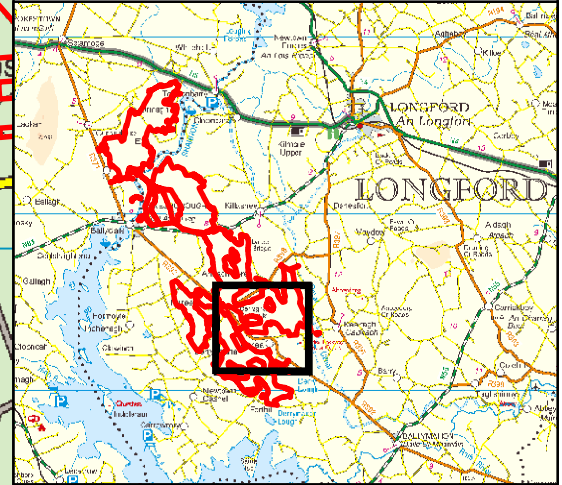
Drawing Title:
Winter 2015-2016 Bird Survey
Snipe Observations 4 of 4

Client: Bord na Mona

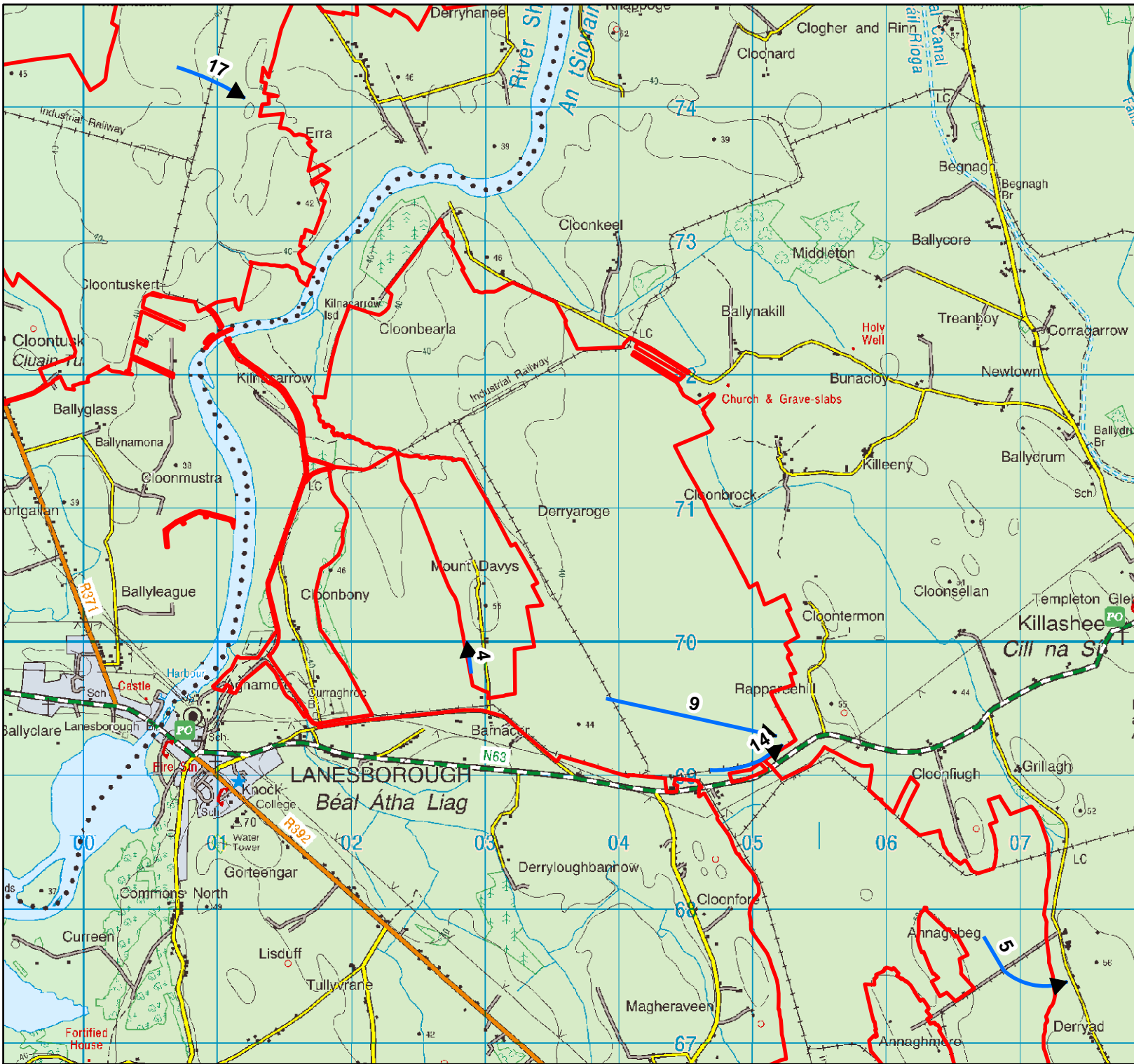
Drawn by: JK
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Drawing Date: 27/06/2016
Drawing Size: A4

Legend

-  Snipe Observation Point
-  Snipe Flight Path
-  Snipe Observation Area
-  Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

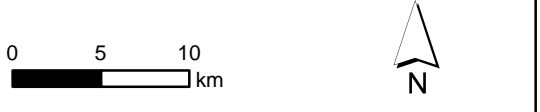
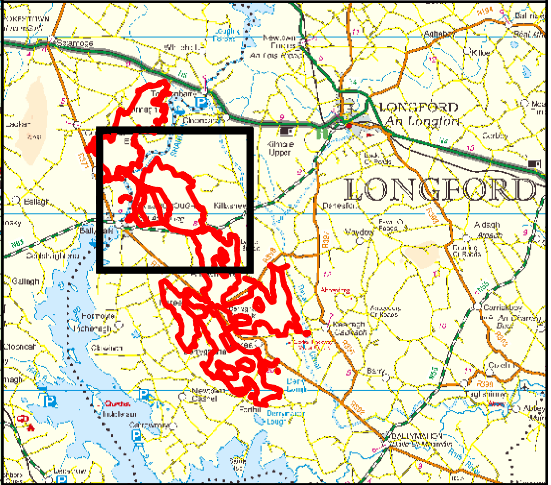
Drawing Title:
Winter 2015-2016 Bird Survey
Sparrowhawk Flight Paths - 1 of 2

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

Legend

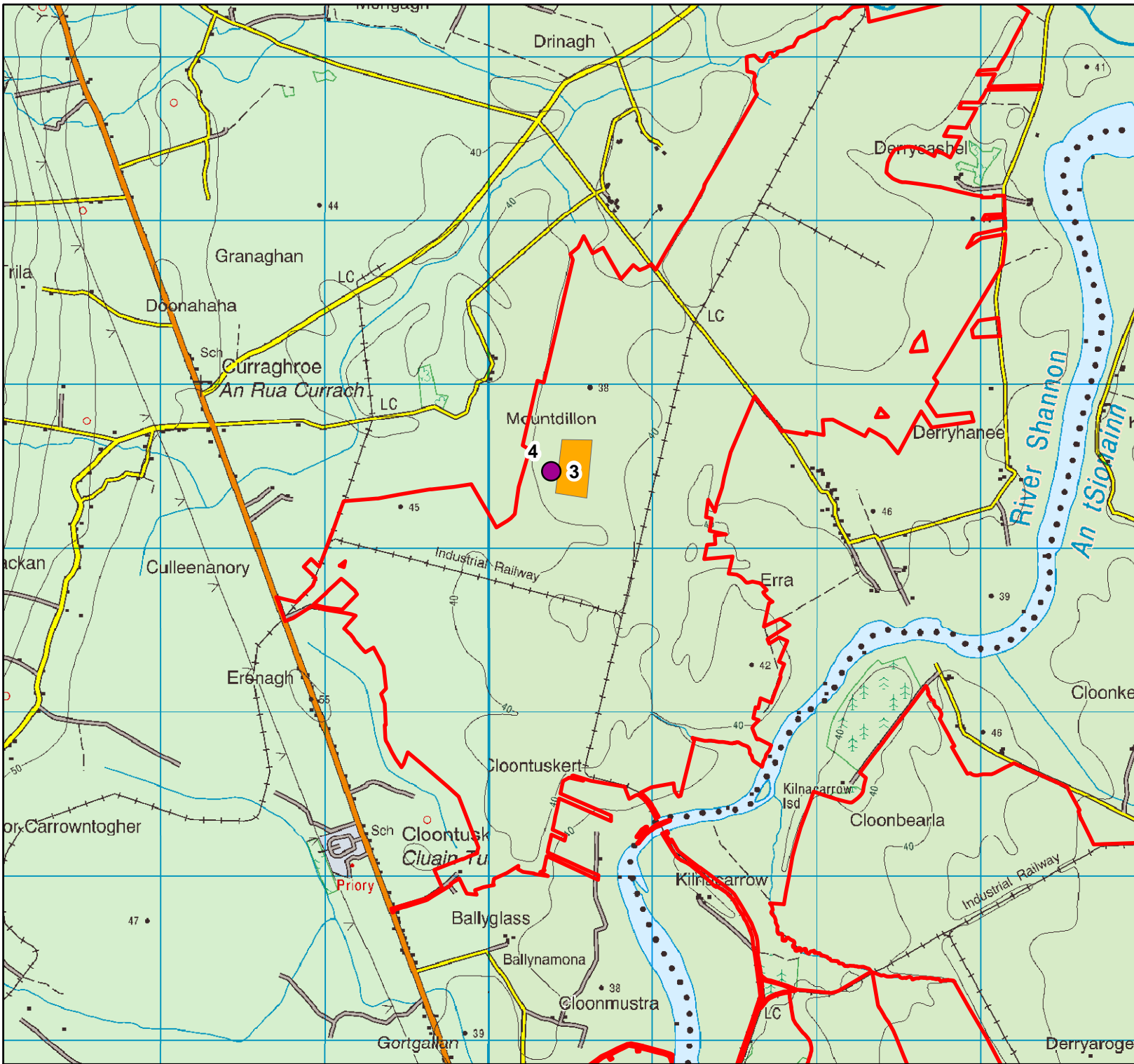
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-  Summer Bird Survey Area



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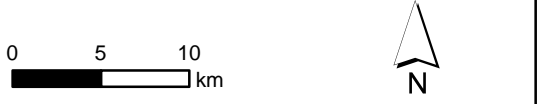
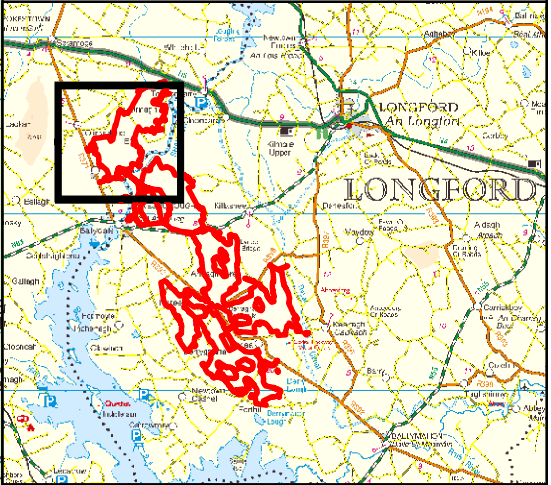
Project Title:
Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Teal Observations

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
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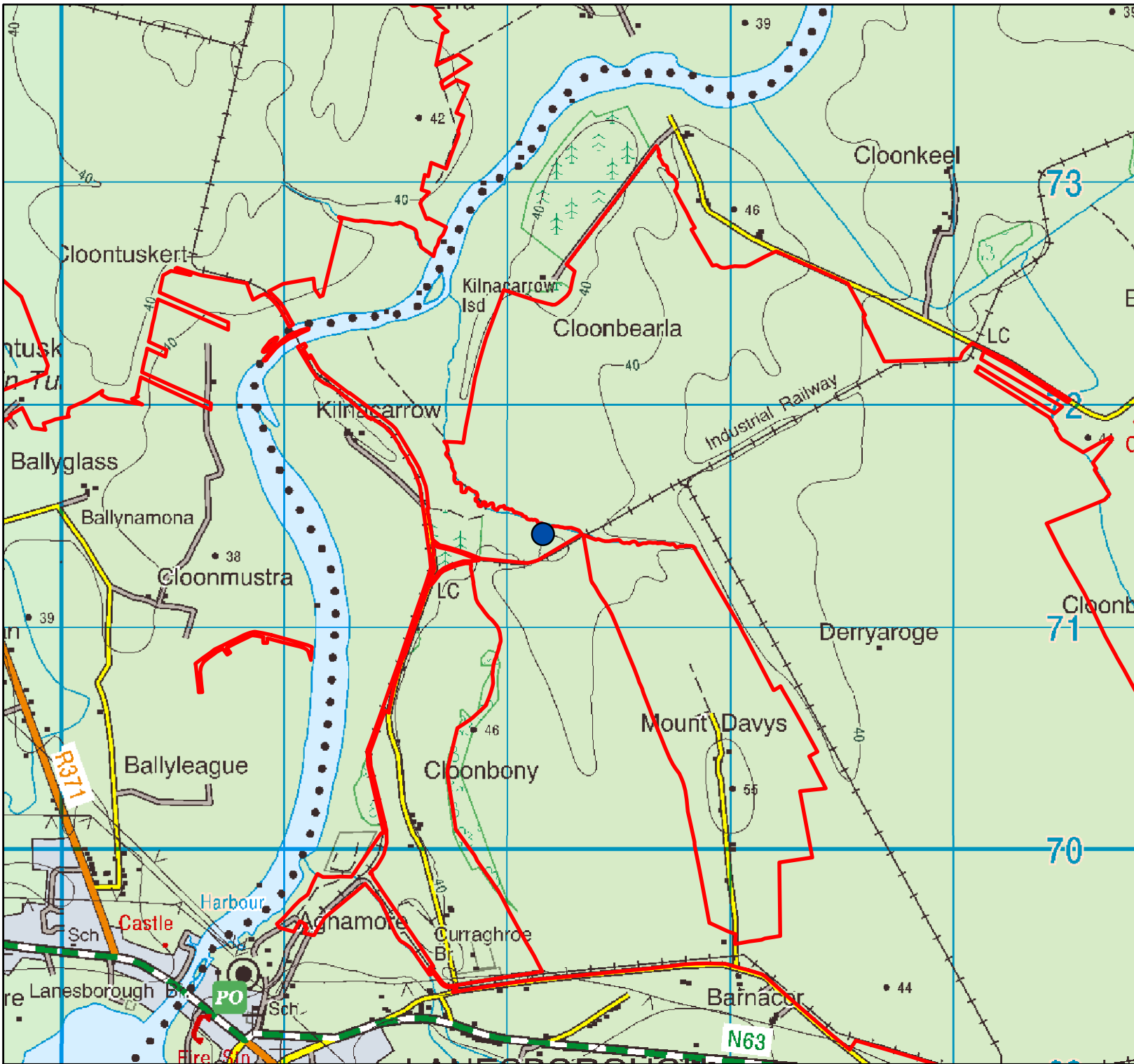
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Bord na Mona Bird Survey

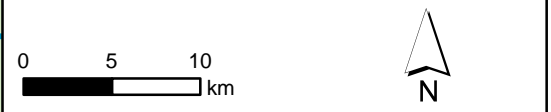
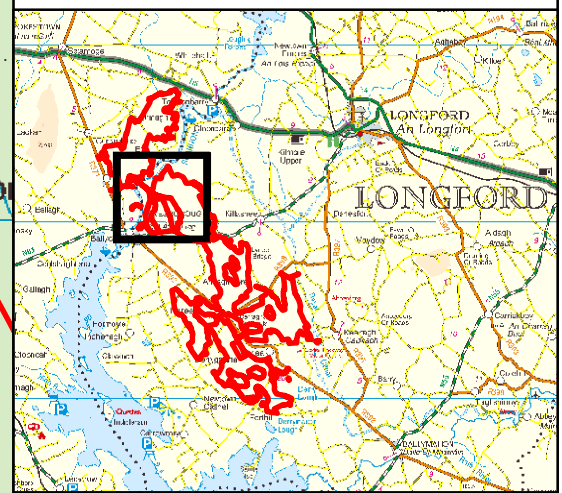
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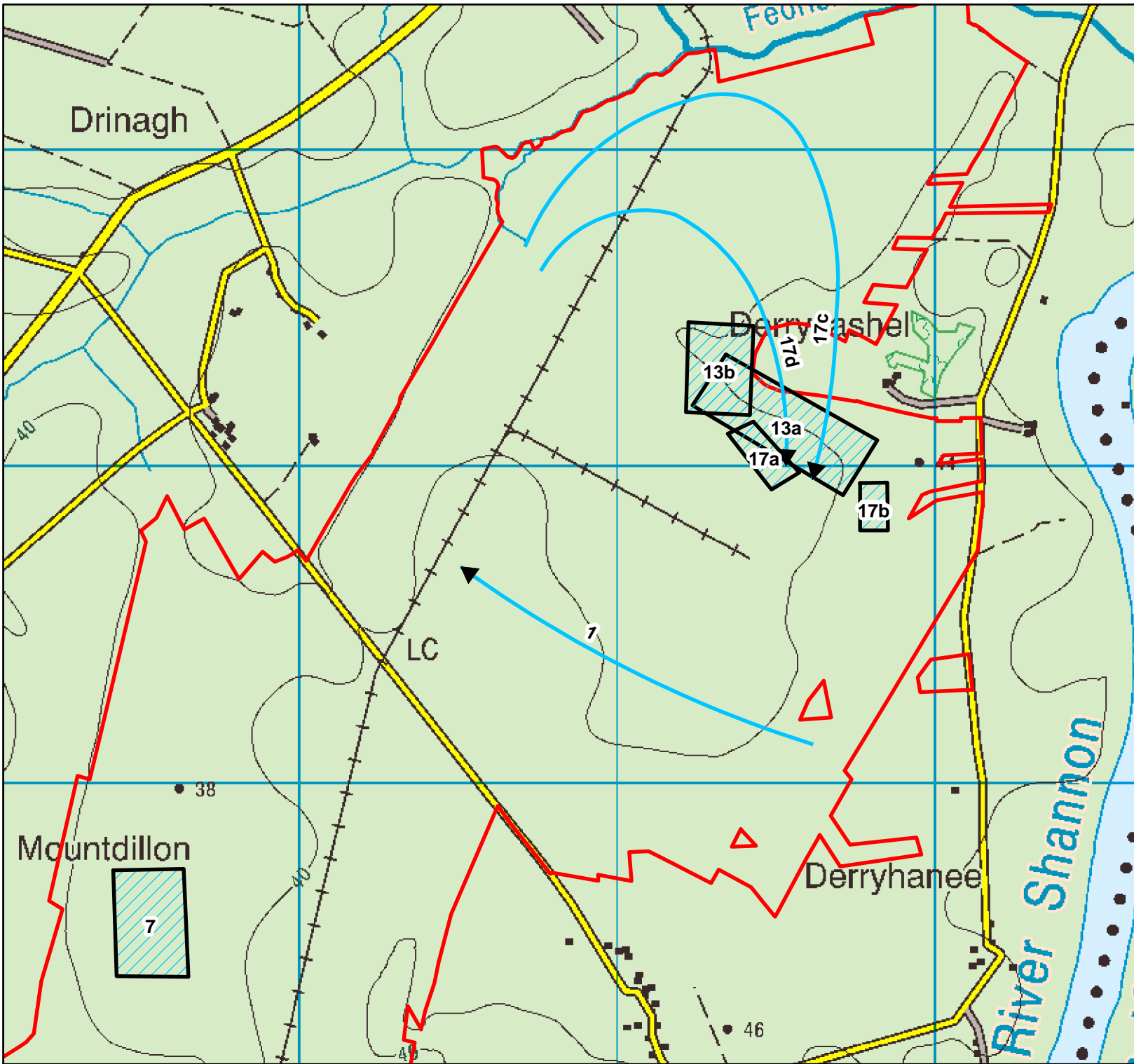
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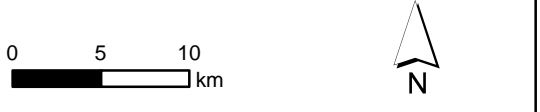
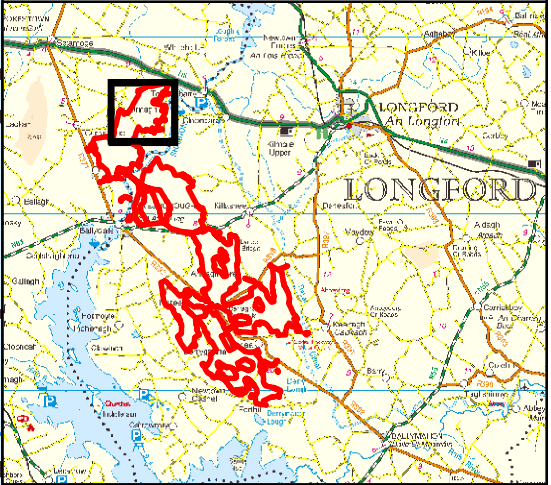
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Client: Bord na Mona

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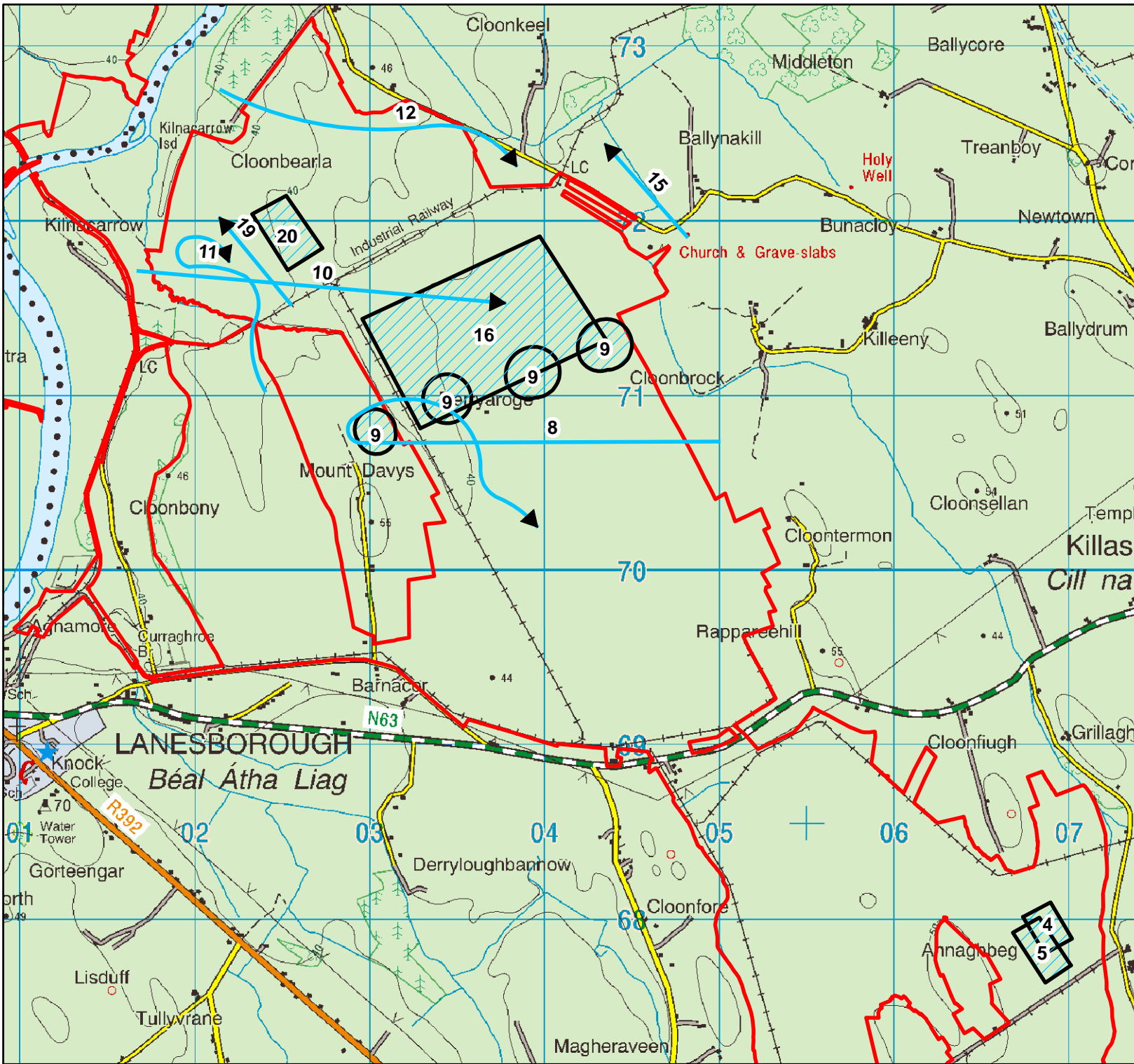
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-  Whooper Swan Observation Area
-  Summer Bird Survey Area



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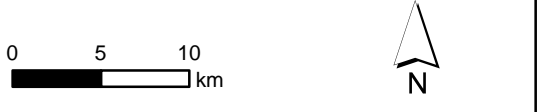
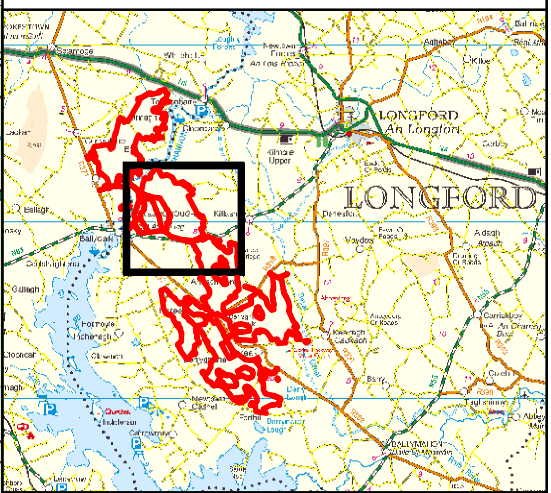
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Client: Bord na Mona

Drawn by: JK
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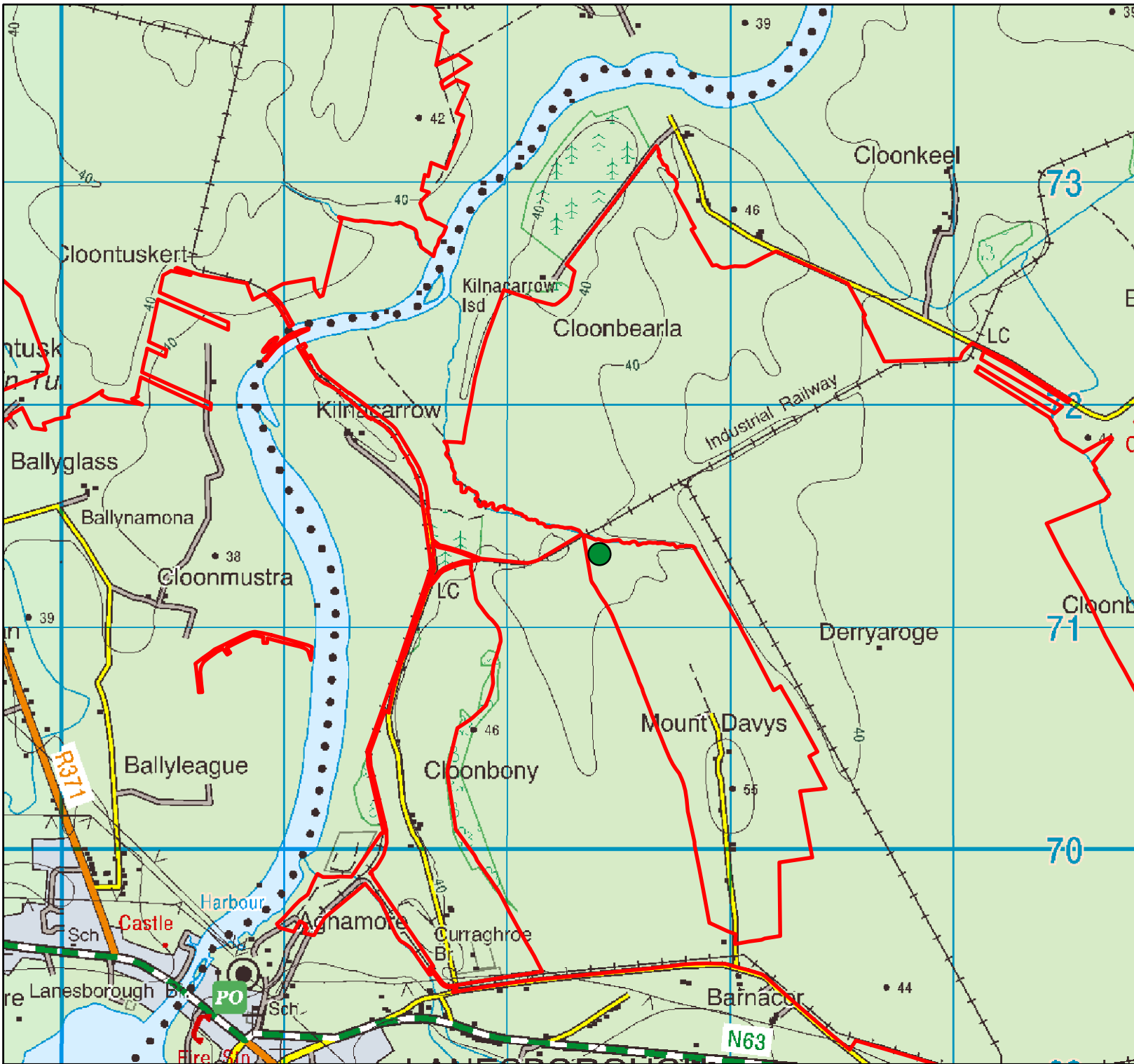
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-  Whooper Swan Flight Path
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 -  Summer Bird Survey Area



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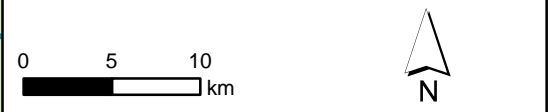
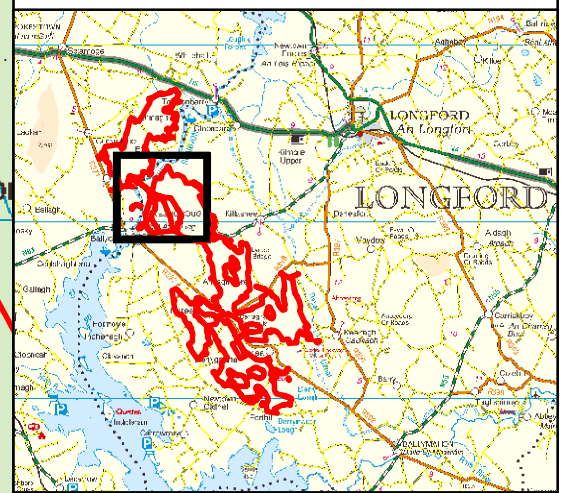
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Woodcockl Observation

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

- Legend
- Woodcock Observation
 - Summer Bird Survey Area



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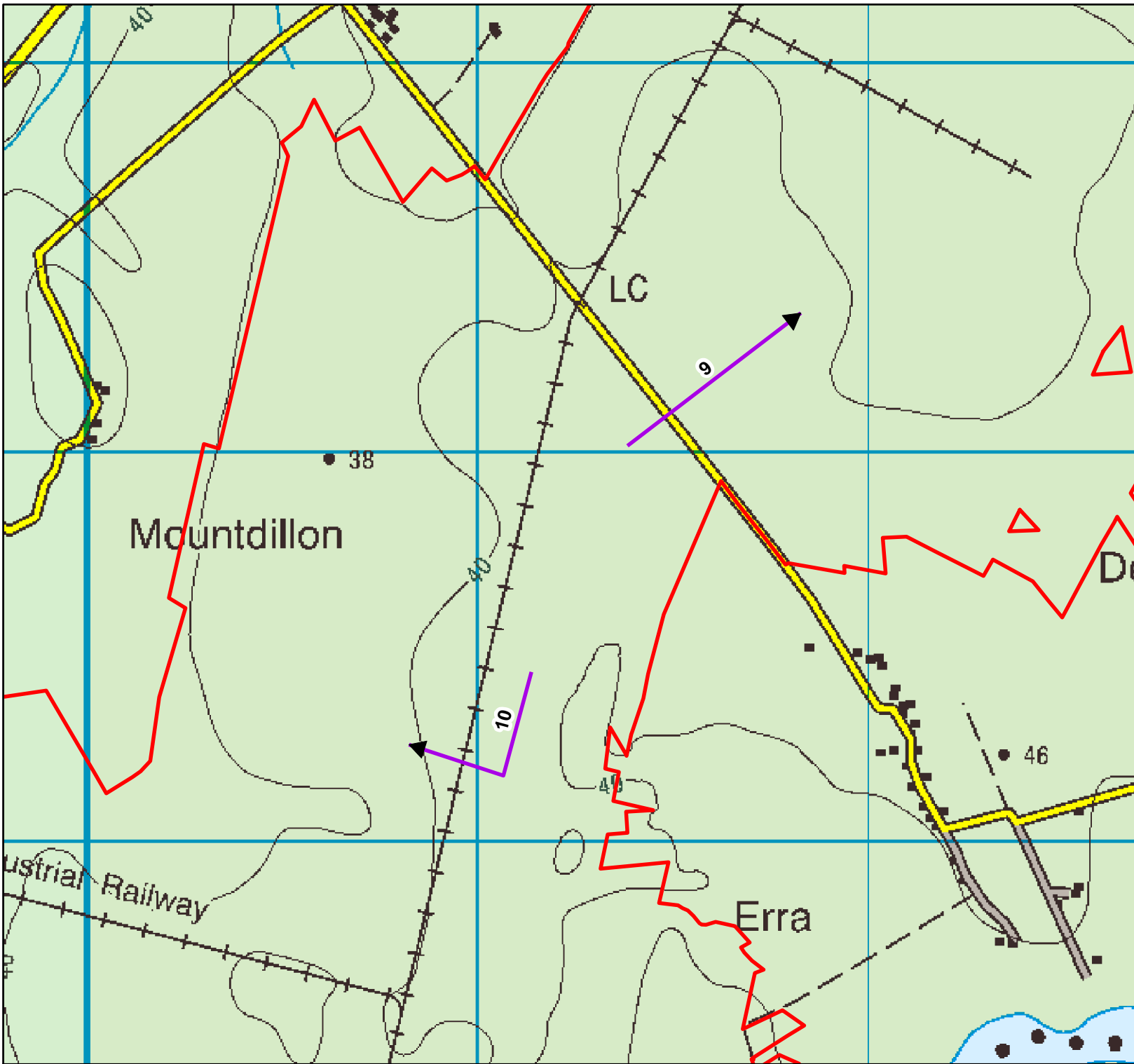
Appendix 6

Transect Survey Results Summary Table

Transect Observations			
Date	Obs. No	Species	Transect
19/11/2015	1	Kestrel	10
19/11/2015	2	Snipe	9
19/11/2015	3	Whooper swan	12
20/11/2015	4	Snipe	11
24/03/2016	5	Grey heron	14
24/03/2016	6	Snipe	14
30/03/2016	7	Kestrel	10
30/03/2016	8	Lesser black-backed gull	10
31/03/2016	9	Mallard	1
31/03/2016	10	Mallard	2
31/03/2016	11	Mallard	5
31/03/2016	12	Buzzard	6
31/03/2016	13	Whooper swan	5

Appendix 7

Transect Maps







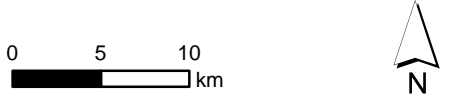
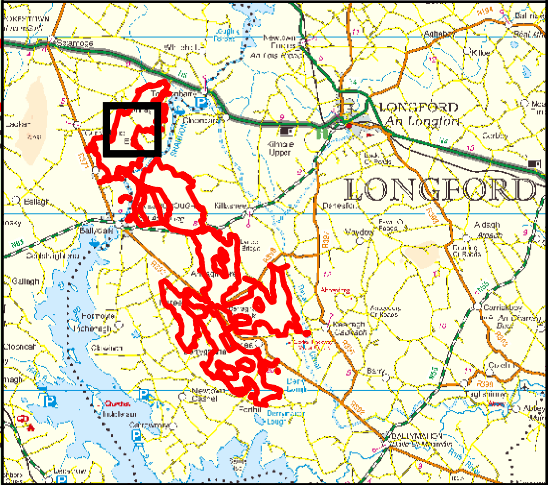
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Transect Observations - Sheet 1 of 5

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

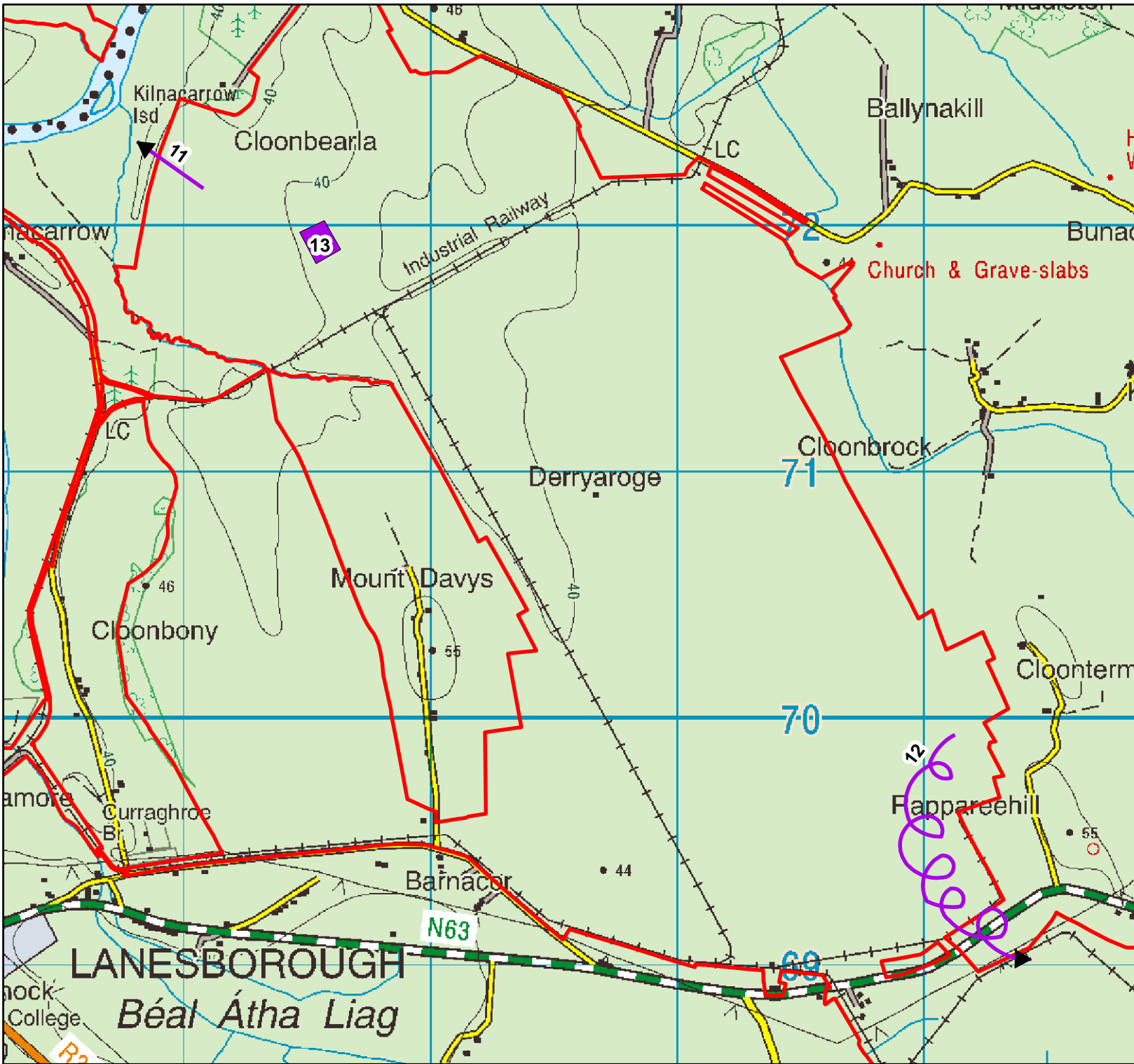
- Legend
-  Transect Observation Point
 -  Transect Flight Observation
 -  Transect Observation Area
 -  Summer Bird Survey Area



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Project Title:
Bord na Mona Bird Survey

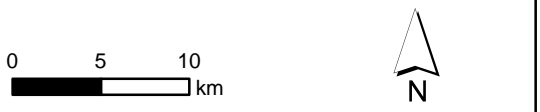
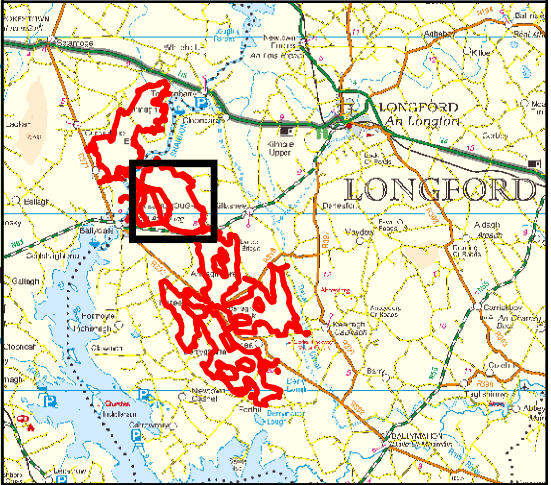
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Winter 2015-2016 Bird Survey
Transect Observations - Sheet 2 of 5

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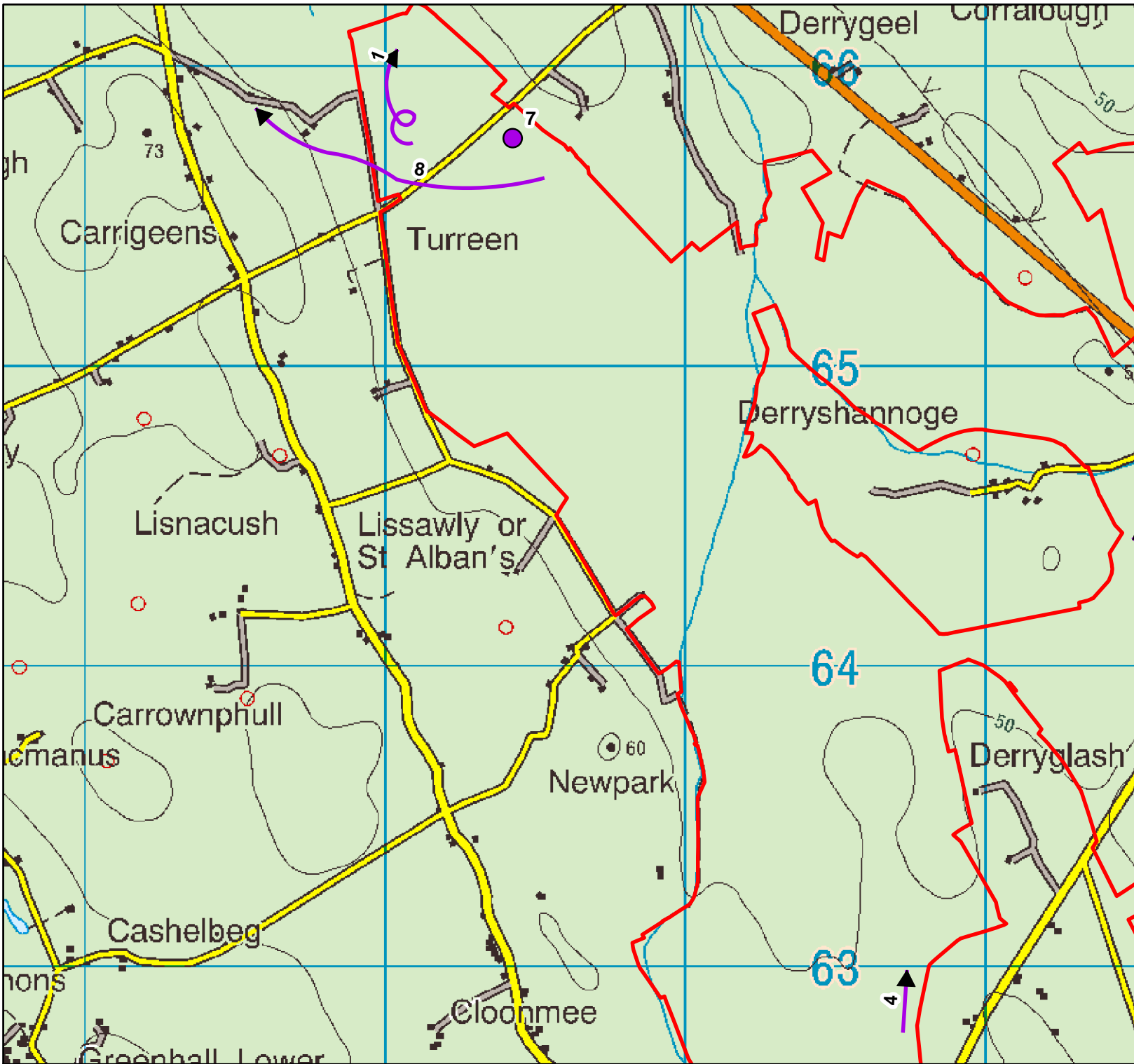
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Drawing Date: 27/06/2016
Drawing Size: A4

Legend

-  Transect Observation Point
-  Transect Flight Observation
-  Transect Observation Area
-  Summer Bird Survey Area



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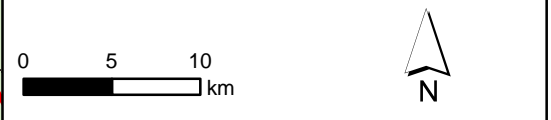
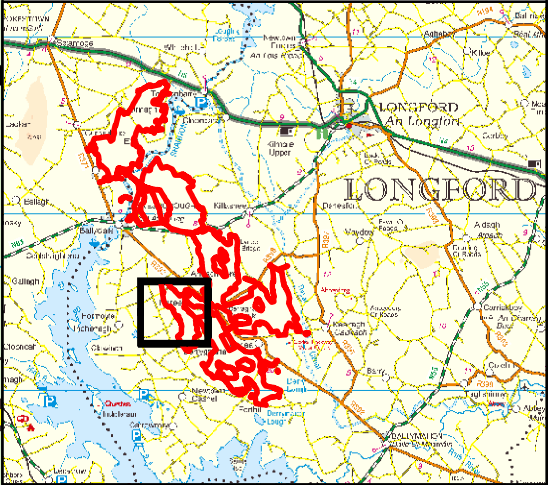
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Drawing Title:
Winter 2015-2016 Bird Survey
Transect Observations - Sheet 3 of 5

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Drawing Date: 27/06/2016
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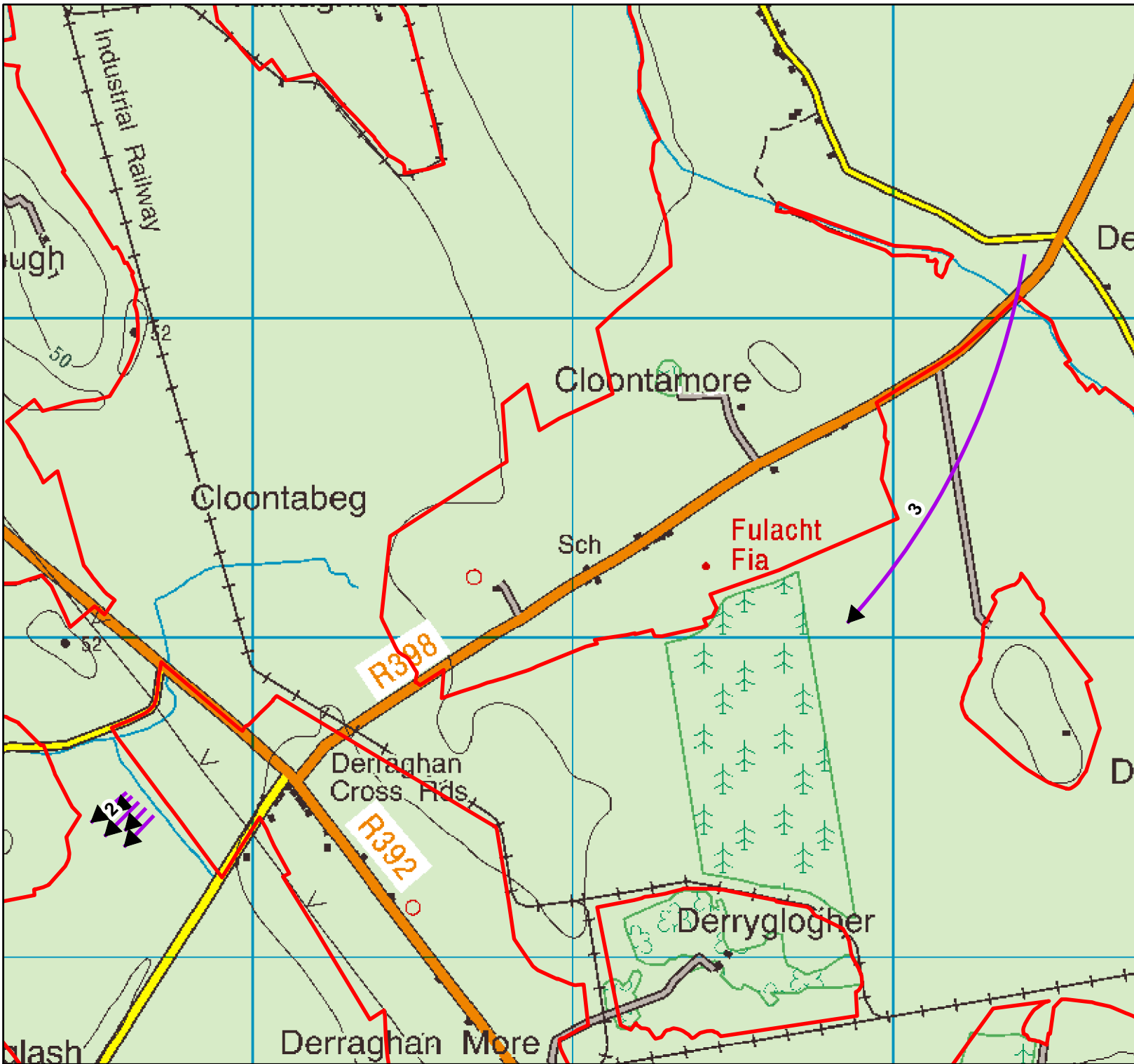
- Legend
-  Transect Observation Point
 -  Transect Flight Observation
 -  Transect Observation Area
 -  Summer Bird Survey Area



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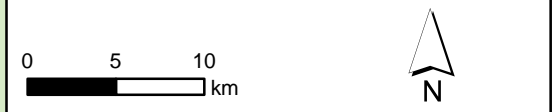
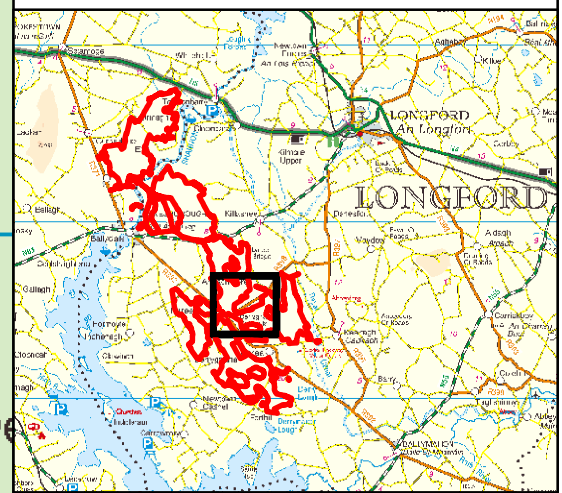
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Transect Observations - Sheet 4 of 5

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Drawing Date: 27/06/2016
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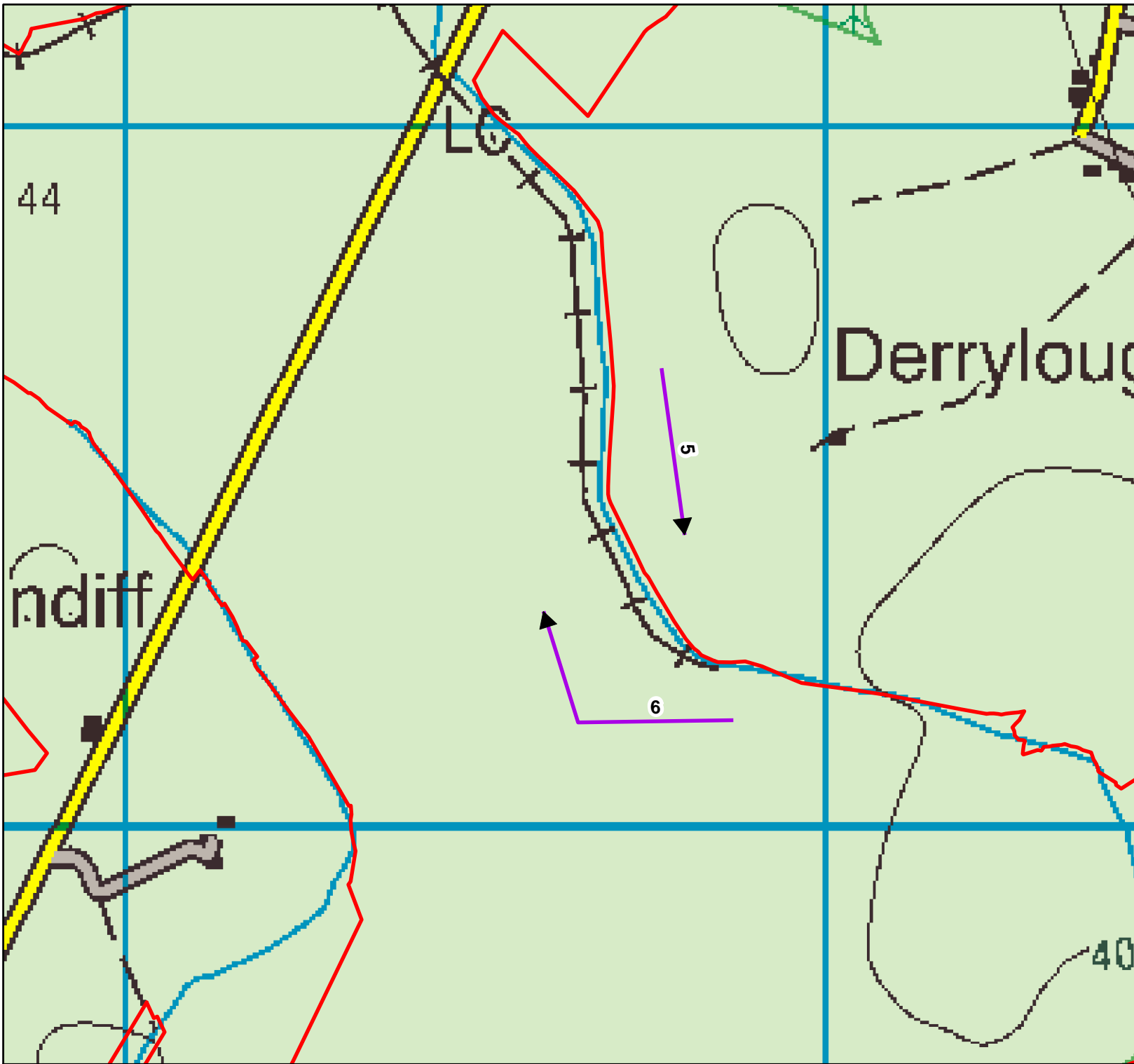
- Legend
-  Transect Observation Point
 -  Transect Flight Observation
 -  Transect Observation Area
 -  Summer Bird Survey Area



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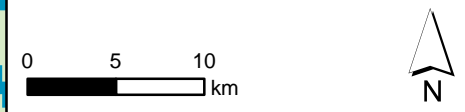
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Bord na Mona Bird Survey

Drawing Title:
Winter 2015-2016 Bird Survey
Transect Observations - Sheet 5 of 5

Client: Bord na Mona

Drawn by: JK
Checked by: JM
Drawing Date: 27/06/2016
Drawing Size: A4

- Legend
-  Transect Observation Point
 -  Transect Flight Observation
 -  Transect Observation Area
 -  Summer Bird Survey Area



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Appendix 8

NPWS Hen Harrier Survey Methodology

RECOMMENDED METHODOLOGY FOR ASSESSMENT OF IMPACTS OF PROPOSED WINDFARMS ON BREEDING HEN HARRIER WITHIN THE KNOWN RANGE OF THE SPECIES IN IRELAND

Of the two main threats to Hen Harriers from wind farms (collision and displacement), the possibility of indirect habitat loss, or displacement, if birds avoid a wind farm area is seen as the most immediate issue. Research to improve assessments of collision risk is ongoing in other countries; the proportion of the breeding population at risk from wind farms that have planning permission at present is small. Other proposed wind farms, within areas of importance for Hen Harrier, should be subject to Environmental Impact Assessment.

RELEVANT SPECIES

Although these recommendations focus on the Hen Harrier as the species of concern, breeding Short-eared Owl may possibly occur at some sites, in which case an assessment of site importance should be made using the same methodology, at times of day appropriate to the species.

ASSESSMENT OF SITE IMPORTANCE

Nine upland areas have been identified by Dúchas as being of national importance for Hen Harrier. All areas of heath/bog habitats within the indicative boundaries of these areas lie within 5km of known nest sites located during the 1998-2000 survey, i.e. within the normal foraging range of the male of each pair. Any proposed development, which may have impacts on such habitats, should be subject to a detailed survey, to determine Hen Harrier usage for hunting (foraging).

Important aspects to be considered in an assessment are:

The numbers and breeding success of Hen Harriers that may forage in the area, ideally within 5km of the proposed development site,

The time spent by Hen Harriers in all parts of the site,

The cumulative impact of other wind farms in the area that have been granted planning Permission.

Spatial variation in an area's importance to foraging Hen Harriers when:

Either occupancy or breeding success are below normal,

Fire, overgrazing or turbary temporarily reduce the vegetation cover and hence its value to foraging birds,

Nest locations change from year to year.

METHODS

Survey of breeding occupancy:

An appropriate survey in good weather conditions, with at least two visits in April of breeding pairs within 5km of the site from outer turbines and a second series of visits in July to determine breeding success, would be necessary to interpret results from foraging observations. In years with a run of poor weather during April and May, an intermediate series of observations may be required in June

to confirm occupancy by breeding pairs or locate late arriving pairs. Useful information is given in Gilbert et al. (1998).

Methodology should be detailed giving dates of survey, map of area searched, and habitat types searched. Results should not include detailed nest locations in public documents (e.g. EIS), but should include minimum distance from the development site.

Data on the number and distance from the site of breeding pairs recorded in the 1998-2000 survey (Norriss et al. 2002), and in subsequent years where available, can be provided by Dúchas (contact dnorriss@duchas.ie).

Survey of proposed development site

Description of survey area:

The assessment area should include a strip at least 500m beyond the outermost turbines. A habitat map of the study area should be produced based on the habitat categories listed in Appendix 1. A more detailed habitat map (for example using the classification in Fossitt (2000) may be appropriate in some cases.

Use of the site:

Madders' (2002) methodology, using timed watches from fixed vantage points (VPs), suits well and can be adapted to local circumstances; those aspects of his procedures relevant to Hen Harriers are summarised below. The objective is to estimate the amount of time birds spend foraging per unit area of the site.

Two 3hour watches per VP per month are recommended for the duration of the breeding season (April – July). A gap of at least one hour between watches is advised.

Restrict observations to 0700-2000 hours and suspend observations during periods of poor visibility and rain.

Select the minimum number of VPs consistent with complete coverage of the site. VPs should be outside the site where feasible, or located so as to avoid disturbance within the site, but within 1km of the ground being observed. Choose inconspicuous locations, well away from nests, to minimise impact on the birds.

Foraging Harriers usually fly within 10m of the ground and characteristically change direction and height abruptly when searching for prey. Record duration of observation and activity of any Harriers observed according to habitat category.

Map the area of each habitat visible from each VP, either in the field, from photographs or using a GIS. If there is area overlap from different VPs, observation areas should be summed when calculating overall observation rates/unit area. Because fields of view can change substantially with even minor changes in VP location, exact relocation using a GPS and perhaps an inconspicuous marker on the ground is recommended if more than one observer is involved.

The Report should include a summary of the sections of the site used by foraging Hen Harriers, broken down by broad habitat category.

If successful breeding is demonstrated in or close to a site, then VP observations should be continued into August to identify areas used by recently fledged juveniles prior to dispersal.

References

- Fossitt, J. A. (2000) A Guide to Habitats in Ireland. Heritage Council. Kilkenny.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998) Bird Monitoring Methods – a manual of techniques for key UK species. RSPB, Sandy.
- Madders, M. (2002) Method statement for Vantage Point watches. In: Survey methods to assess wind farm impacts on upland bird communities. Scottish Natural Heritage.
- Norriss, D.W., Marsh, J., McMahon, D. and Oliver, G.A. (2002) A national survey of breeding Hen Harriers *Circus cyaneus* in Ireland 1998-2000. Irish Birds 7: 1-10.

APPENDIX 1A

Recommended classification of habitat types for use in assessments of wind farm sites for Hen Harrier

Habitat code

Description

NF

NF 2

New forestry plantation, trees 20-30 cm high

NF 3

New forestry plantation, trees c 1m in height

NF 4

New forestry plantation, trees >2m in height, patchy thickets

2nd F

2nd F 1 & 2

2nd rotation forestry plantation, trees 20-30 cm high

2nd F 3

New forestry plantation, trees c 1m in height

2nd F 4

New forestry plantation, trees >2m in height, patchy thickets

F

Post thicket plantation

G

Grazing

RG

Rough Grazing & rushy pasture

H/B

Heath / Bog

DE

Deciduous woodland & scrub

GO, Gorse