Appendix 7-2

2019 Breeding Bird Survey Report

Malachy Walsh and Partners
Engineering and Environmental Consultants

Breeding 2019 Bird Surveys
Shronowen Wind Farm

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NOTE: The following conventions have been followed with regard to species.

1. **First instance of any species name in the text: Common name followed by full form Scientific Name**

Daisy (*Bellis perennis*)

2. **2nd instance: Common name followed by abbreviated Scientific Name**

Daisy (*B. perennis*)

3. **Within tables: 1 or 2 above depending on circumstance.**
4. **In Headings and within body of text: Unless first instance – Common name only**

Daisy

1 SUMMARY OF FINDINGS

Only two of the 13 Primary Target Species[1] and one of the 15 Secondary Target Species were recorded during the survey period. The numbers of observations of individual Target Species, and the activity of bird species generally, was extremely low. The species recorded are as follows:

- Primary Target Species:
  - Hen harrier (*Circus cyaneus*): 4 observations
  - Kestrel (*Falco tinnunculus*): 14 observations

- Secondary Target Species
  - Snipe (*Gallinago gallinago*):2 observations

In addition, non-target species namely, mallard (*Anas platyrhynchos*), buzzard (*Buteo buteo*), little egret (*Egretta garzetta*), lesser black-backed gull (*Larus fuscus*) and unidentified gull's were also recorded.

While the full results of the survey are described in comprehensive detail in **Section 12**, a brief summary is presented here for information and for ease of review.

Hen harrier was recorded on four occasions and during four of the six months of the breeding survey period 2019. During this survey period flight paths were recorded to the south and to the east of the site. These birds were flying, circling, hunting and perched at heights between 0m-150m. These hen harriers activity occurred mostly over the bog, scrub and forestry. Kestrel was recorded on 14 occasions during four of the six months of the survey period. During this survey period half of the flight paths were recorded from VP1 and habitats overflown include bog, forestry, and scrub mainly. Kestrel were observed flying, hunting, soaring, circling, and being mobbed and flight heights ranged between 0m-50m. Whooper swan were not observed during the survey.

Snipe, were recorded on two occasions during two of the six months of the survey period. During this survey period flight paths were recorded from VP2. Snipe were observed flying over bog and scrub at heights between 0m-20m

Mallard was recorded on four occasion during two of the six months of the survey period. All flight paths were recorded from VP2 flying between 0m-20m over bog. Buzzard was recorded on one occasion during April. A male was recorded from VP1 mobbing over moorland at 50m->150m. Little egret was recorded on two occasions. Flight paths were recorded from VP3 of the birds flying over bog, forestry, and scrub at 0m-50m height. Lesser black-backed gull was recorded on two occasions during one of the six months of the survey period. Flight paths were recorded from VP1 and VP3 of gulls flying and soaring over bog, forestry and moorland. An unidentified gull was recorded on two occasions on the same day in June. These were flying over bog at 20m-50m height. It is considered, on the basis of the survey data that unidentified gulls were possibly lesser black-backed gulls given that they were observed flying over similar sections of the site.

[1] See **Section 10**

2 INTRODUCTION

Malachy Walsh and Partners have been commissioned by Emerging Markets Power (NI) Ltd., to conduct bird surveys, during the winter of 2018-2019 and summer 2019, at the location of a proposed wind farm development at Shronowen Bog near Ballylongford, County Kerry, (Irish Grid Co-ordinates: R 00498 40715). The survey area, outlined in red, in **Figure 1**, below, includes the proposed development site and areas adjacent. This report presents the results of the summer 2019 survey. A previous report (report ref. 19746-6002-A) has been completed for the winter 2018-2019 survey.

This report comprises a description of those surveys and the results.

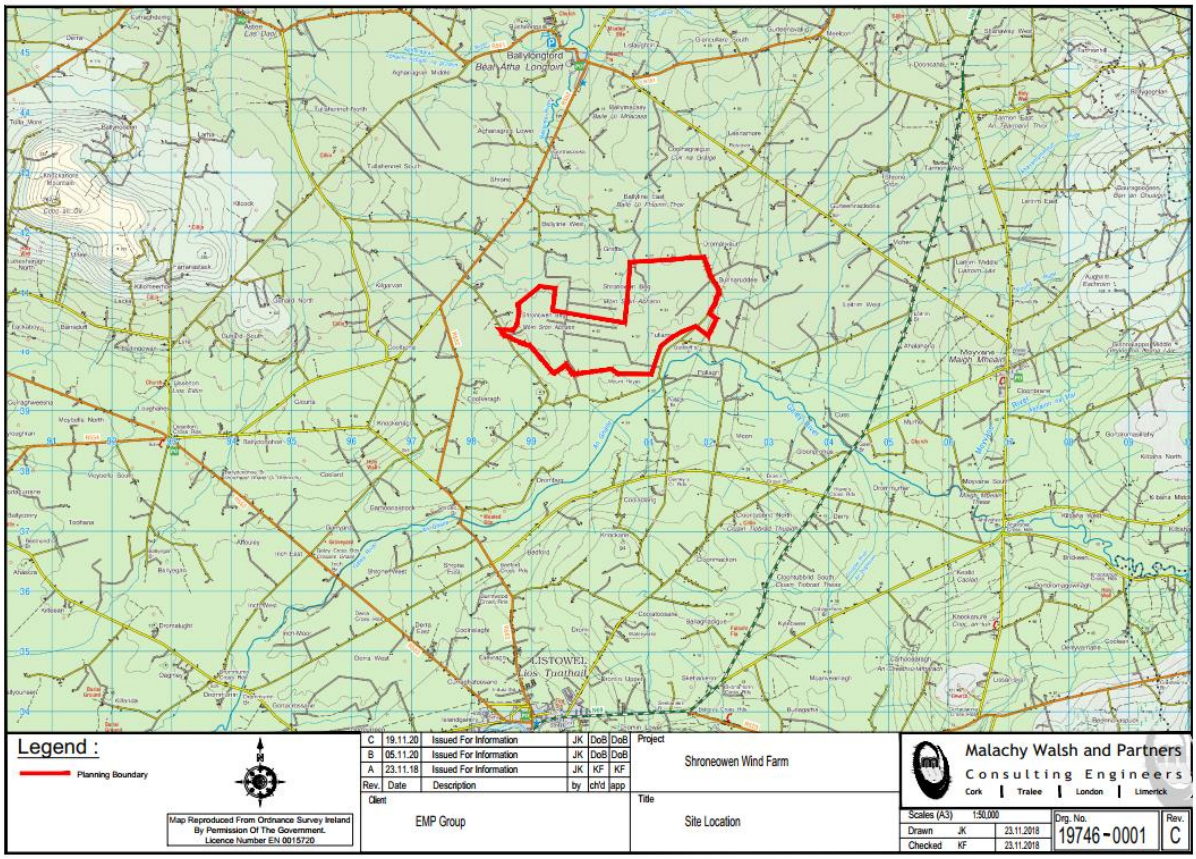


Figure 1: Site Location in red

3 PURPOSE OF SURVEY

The survey was designed to determine the mix of species present and their behaviours and distribution within the survey area during the survey period. As reliable comparisons can then be made between these data and any subsequent survey data and, collectively, these will form a baseline upon which any future monitoring/multiyear surveys may be compared and, in the event of a consent application, will inform any impact assessments. The survey was conducted in compliance with the primary guidance used by the competent authorities in Ireland when assessing planning applications for a wind farm in circumstances where the impacts on avian ecology are germane, namely SNH (2017).

In summary the survey design will identify the species assemblage and the spatial and temporal distribution of activity. The range of methods used and survey effort involved are site and species

specific and are informed by a desk study, site reconnaissance, by extensive survey experience in the surrounding area and by knowledge of the bird assemblage present in the north Kerry area.

4 CONSTRAINTS

Surveyors did not have permission to access any lands outside the client's control. However, this did not impose a significant constraint on sampling as these lands comprise, almost exclusively, agricultural grassland habitats and it was expected, in light of the fact that several of the vantage points are located close to to these agricultural habitats, that the typical species associated with these areas would be detected during the vantage point surveys.

5 SURVEY DESIGN

Compliance with SNH (2017) requires that two main broad survey types are included in the survey design.

- **Distribution and Abundance Surveys**. These are surveys to record numbers and distribution of breeding, wintering and migrant birds using the site. They will allow the evaluation of a site's importance and provide information to help quantify predicted impacts from disturbance and displacement.
- **Vantage Point (VP) Surveys**. These surveys, which, in the case of the Shronowen site, were required, comprise a series of watches from a fixed location to quantify the flight activity of birds at a proposed development site, which provides data to estimate the collision risk.

The decision as to which of the survey methodologies are required is based on the outcome of a scoping exercise which determines which species are considered likely to use the habitats in the study area.

The survey includes a number of methodologies, described in **Sections 9.1** and **11**, below, that have been selected, from the list of survey types identified in SNH (2017), for their capacity to detect and record the activities of the species expected to be present in the survey area during the survey period. The methodologies selected ensured that a structured approach to survey work was implemented throughout. While all aspects of the activities of the observed Target Species were recorded, the primary aim of the surveys is to understand bird use of the survey area; a secondary purpose is to provide data for Collision Risk Modelling (CRM). A detailed description of how information on flight behaviours was recorded will be provided, under the appropriate headings, in **Section 11**.

The survey design and execution is informed by extensive in house experience across a broad range of comparable surveys conducted in similar areas with specific reference to those carried out in the north Kerry and west Limerick.

6 SCOPING TO IDENTIFY TARGET SPECIES

Compliance with SNH (2017) requires that prior to the commencement of surveys a scoping exercise is carried out to determine a broad overview of which species are likely to be at the site, their likely sensitivity to impacts from wind farms and the proximity of relevant designated sites. This allows the

selection of primary, and potentially secondary, target species (see **Section 10** below) and these species will form the basis of the survey programme.

6.1 CRITERIA FOR SELECTION OF TARGET SPECIES

6.1.1 Legislative Protection and Conservation Status

When compiling the list(s) of Target Species, consideration of legislative protection and conservation status are of primary importance, In this regard, there are three important species lists from which Target Species may be drawn:

- Listed in Annex 1 of the EC Birds Directive;
- Protected under the Wildlife Acts, 1976 to 2012; and
- Red-listed species as per Colhoun & Cummins (2013)[2].

Within the scope of the criteria outlined above, SNH (2017) recommends that the Target Species should be limited to:

- Those species which are afforded a higher level of legislative protection; and
- Those species which, as a result of their behaviours, are more likely to be subject to impact from wind farms.

A precautionary approach was adopted and the selection followed the guidance set out for determining the sensitivity and importance of bird species as outlined in Percival (2003). Percival's methodology was considered alongside the other literature relating to the effects of wind farms on birds as reviewed in Whitfield and Madders (2006) and Drewitt and Langston (2006). These sensitivities were evaluated using the criteria set out in **Table 1**. When compiling the list cognisance was also taken of the constraints imposed on the distributions on the species due to their known habitat requirements and distributions.[3] Those species selected as Primary Target Species are listed in **Section 10.1** and those selected as Secondary Target Species are listed in **Section 10.2**.

Table 1: Determining the sensitivity and importance of bird species (adapted from Percival, 2003)

Sensitivity	Determining Factor
VERY HIGH	Where the site is an SPA
	Species present in nationally important numbers (>1% Irish population)
HIGH	Ecologically sensitive species (e.g. divers, common scoter, golden eagle, hen harrier, chough and roseate tern)
	EU Bird Directive Annex I species
	Red-listed Species of Conservation Concern
MEDIUM	Amber-listed Species of Conservation Concern
	Species present in locally important numbers (>1% of county population)
LOW	Amber-listed Species

[2] Birds on the Red List birds are those of highest conservation concern, Amber List birds are of medium conservation concern and the Green List birds are not considered threatened.

[3] As outlined at https://www.birdwatchireland.ie

6.1.2 Potential Effects of Wind Farms on Birds

Detailed knowledge of bird distribution and flight activity is necessary in order to predict the potential effects of a wind farm on birds. However, the scope and scale of the survey data taken and the suite of species on which data is collected should be informed by the analysis that wind farms present three main potential risks to birds (Drewitt & Langston 2006, 2008; Band *et al*. 2007, cited in SNH, 2017). These are:

- Direct habitat loss through construction of wind farm infrastructure;
- Displacement (sometimes called indirect habitat loss) if birds avoid the wind farm and its surrounding area due to turbine construction and operation. Displacement may also include barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds; and
- Death through collision or interaction with turbine blades and other infrastructure.

Due to the unique ecology of each species each will have different sensitivities to each of these three impact sources.

6.1.3 Existing data, Records and Expert Knowledge

Cognisance must also be taken of existing data and records, expert knowledge of the species assemblage present in the wider north Kerry/west Limerick area, and the influence on bird distribution of the habitat mix within and adjacent to the survey area whose presence within the survey area is reasonably foreseeable in light of the habitats present, both within the survey area and in the surrounding landscape.

7 SITE RECONNAISANCE SURVEY

As per SNH (2017) requirements that, prior to the commencement of surveys, a scoping exercise is carried out reconnaissance of the site and its surrounds was carried out by MWP staff ecologists. These visits enabled an evaluation to be made of the habitat characteristics of the site and the identification of VP locations considered suitable to provide maximum site coverage. As stipulated by the client, all surveys were undertaken within lands within which landowner's permission had been arranged or on public roads. Access was not permitted to private lands outside the client's control.

8 DESK STUDY

8.1 DESCRIPTION OF THE SURVEY AREA

The site largely comprises cut-over bog (*sensu* Fossitt, 2000), which in its original form was a blanket bog, but which is now substantially cut-over and significantly altered by turf cutting. It is situated within a landscape dominated by agricultural grassland habitats and with some commercial conifer plantations against which the bog itself abuts (see **Figure 2** for Corine Landcover where they are represented in yellow and green, respectively)[4].The topography of the site is essentially flat, albeit, with the slight peat dome that is a characteristic of the lowland bog type. The site is intersected by a

[4] Areas of bog are shown in purple, forestry in green and pastureland is shown in yellow.

network of access tracks of robust construction that, while too rough for cars, are, for the most part, in good condition.

Turbary rights pertain to the entire site and much of the original peat mass has been removed. While a large central area remains relatively uncut, a crisscross network of drains intersects the site and significant proportion of the bog now comprises a mix of exhausted banks or banks that are currently being, or historically have been, worked. A significant effect of the peat extraction is the extent to which the water table across the site has been lowered permanently. Because the water table plays an important role in aerobic and anaerobic processes in a bog, the lowering of the water table within the peat boundary, between the upper aerobic acrotelm (living) layer and the underlying, water-logged and compacted, catotelm (dead) layer, has fundamentally altered the peat forming capacity of Shronowen Bog.

While the dominant current practice is removal of peat by excavator to a hopper from which the peat is then extruded (see **Drone Flown Image 1**) there is clear evidence of historic sausage cutting in the eastern part of the site (see **Drone Flown Image 2**). **Aerial Image 1** illustrates the extent to which, over time, the peat mass has been removed progressively and incrementally from the edge of the bog (represented in blue) to the interior area of the peat mass.

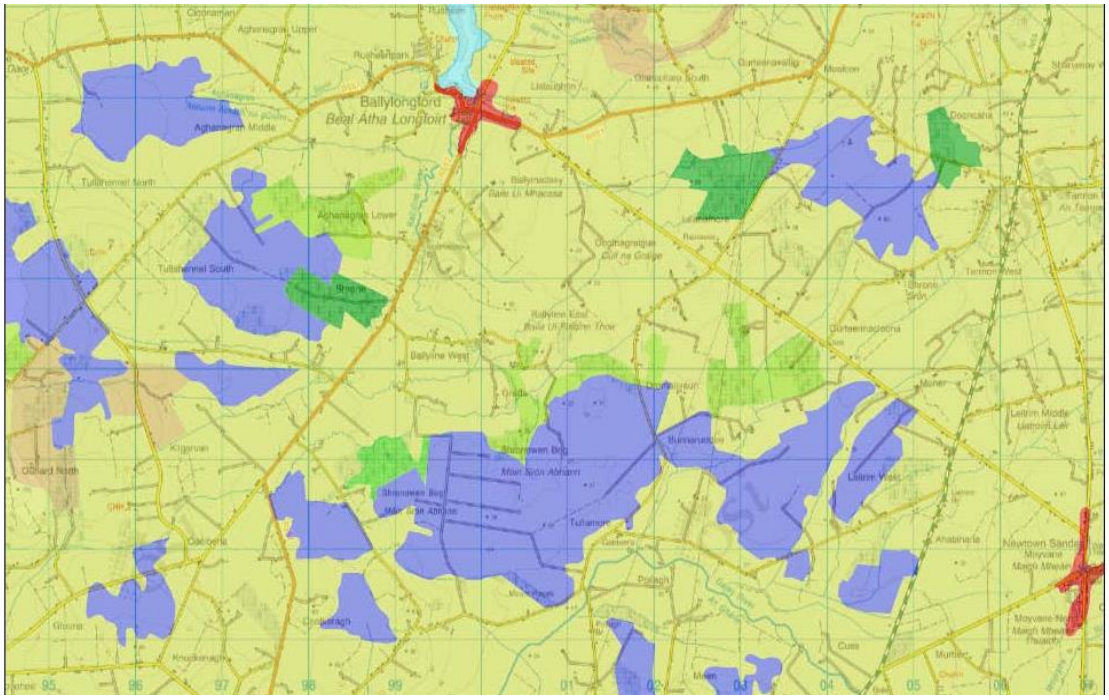
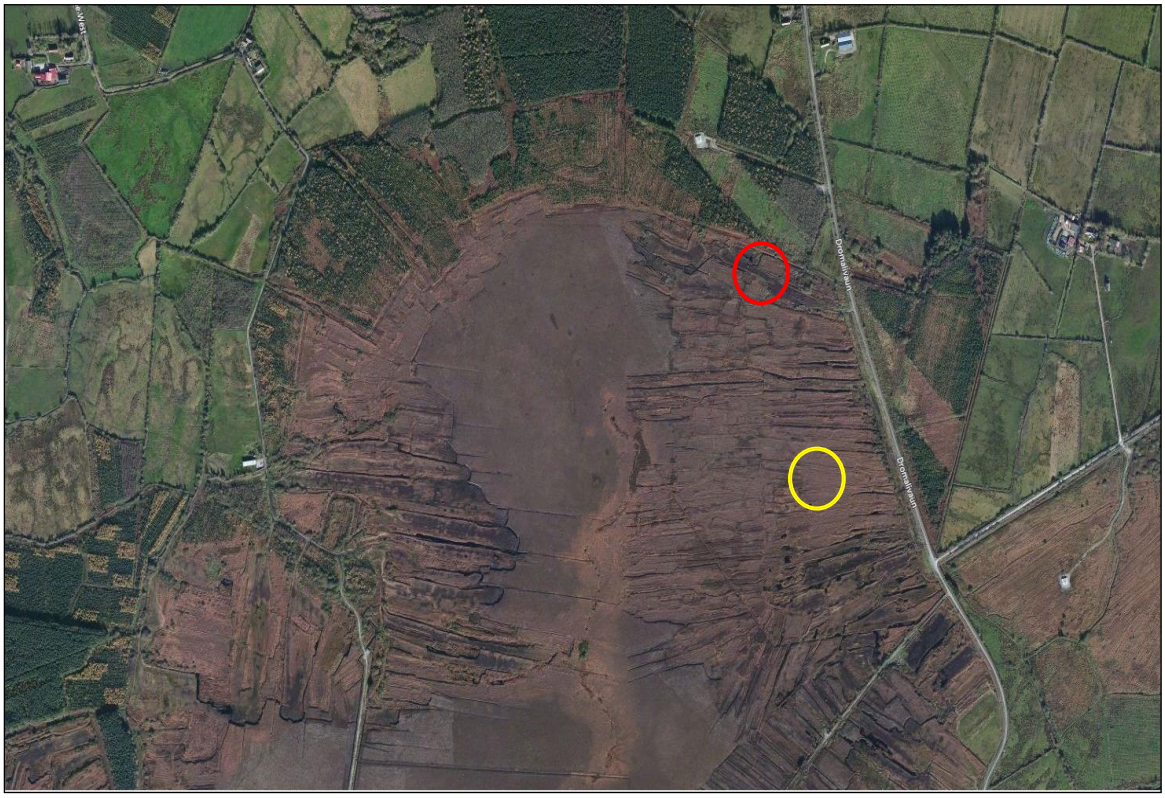


Figure 2: Corine Landcover (2006) [from EPA Maps]



Aerial Image 1: Typical view showing distinct signature of turf banks progressing from edge to centre at northern section of Shronowen Bog. (Red circle: approximate location of Drone Image 1; Yellow circle approximate location of Drone Image 2).

Drone Flown Image 1: Extruded turf with excavated bank adjacent (2019)

Drone Flown Image 2: Evidence of historic sausage cutting (*parallel 'scars' aligned left to right*)

The vegetation communities that the bog supports are constrained by the nutrient poor conditions that pertain and the cover currently comprises a relatively uniform and homogenous cover of Purple Moor-grass (*Molinia caerulea*). While heather is present, surveys indicate that it is not a significant component in the overall plant mix. A few isolated treelines are present; these consist primarily of birch (*Betula* spp.) and all are of a relatively low stature with an average canopy height in the region of 5 m. Areas of willow scrub (*Salix* spp.) are also present; however, these are primarily distributed within the transitional marginal habitats that fringe the bog, in the interface areas between the agricultural and commercial forestry habitats and the bog itself. Willow shrub lines also fringe the sides of the tracks in many places. A variety of grasses and ruderal species have colonised the margins along the sides of the tracks where disturbance has disrupted the dominance of the indigenous vegetation that dominates the reminder of the site. A significant proportion of the site comprises bare unvegetated ground which is present in areas where sustained peat extraction has been occurring recently.

While the site is intersected by a network of man-made drains, the only natural water body within the site is an unnamed tributary[5] of the Ballylongford River which drains from a point of origin in the north of the site. Apart from some localised ponding of water in some of the lower lying peat banks no established ponds or other bodies of standing water were noted during the site surveys and none are visible in the range of aerial imagery reviewed[6]. While stands of Bulrush (*Typha latifolia*) are present in some trackside drains in the western part of the site, the individual stands are generally small and localised and the distribution within the site is somewhat uneven and diffuse.

In summary the site is, both topographically and ecologically, relatively homogeneous, a characteristic that inhibits species diversity not only in terms of the floristic communities and insect species but also

[5] River Waterbody Code: IE_SH_24B030700 https://gis.epa.ie/EPAMaps/

[6] OSI aerial imagery (1995 to 2012); Google imagery (2017); Bing (undated)

in the variety of bird species, particularly passerines, likely to be present. It is unlikely to provide significant foraging, roosting or breeding habitats for many bird species.

8.2 BIRD SENSITIVITY TO WIND ENERGY DEVELOPMENT

The National Biodiversity Data Centre's (NBDC) online mapper[7] includes a layer which provides information on sensitivity to wind energy development. This layer is derived from a collation of existing distributional data, which indicates, by assessing the characteristics of a selected number of the most-sensitive bird species, whether protected birds are likely to be sensitive to wind energy developments in the areas mapped. The mapping layer is derived from McGuiness *et al.* (2015) and while it does not include all vulnerable species - due to data and other issues - and does not replace SEA, AA or EIA requirements nor the need to tailor survey and research to specific sites, it provides a useful metric to rank sites, at the initial scoping stage, in terms of their potential sensitivity to wind energy development. The layer has four sensitivity ratings, namely Low, Medium, High and Highest. These ratings are mapped at 2km grid square resolution for which 'All Birds Sensitivity Scores' (ABSS) are provided.

The survey area and the geographical area extending away from it is categorised as Low Sensitivity (see **Figure 3** and **Figure 4**, below) and the ABSS is 14.8.

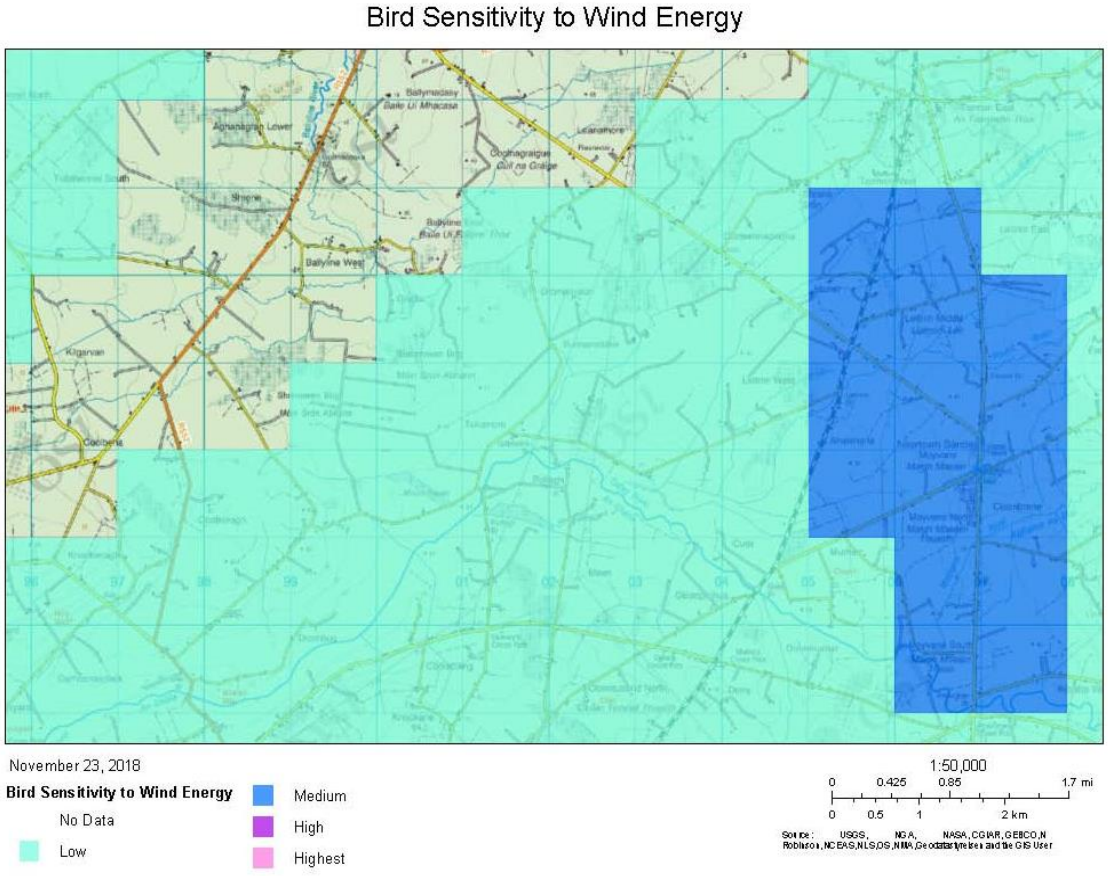


Figure 3: Bird Sensitivity to Wind Energy Development (from http://maps.biodiversityireland.ie/#/Map)

[7] https://maps.biodiversityireland.ie/Map

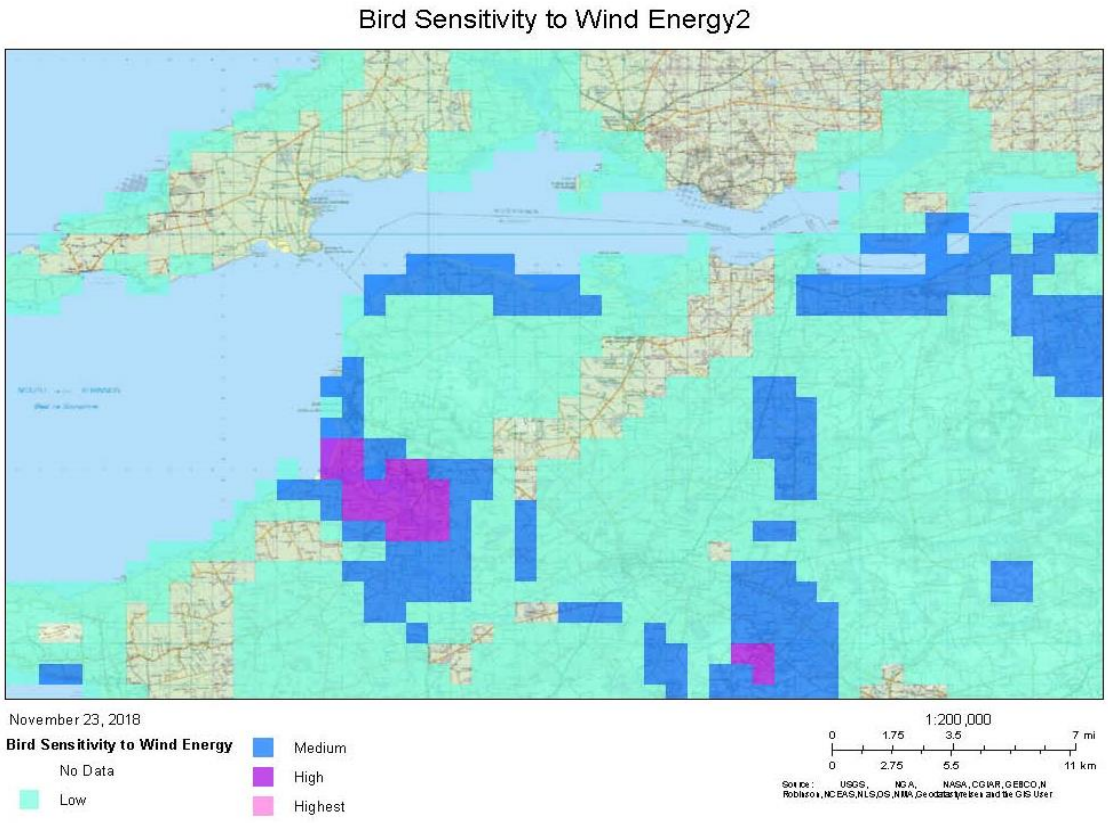


Figure 4: Bird Sensitivity to Wind Energy Development (from http://maps.biodiversityireland.ie/#/Map)

8.3 SITES OF INTERNATIONAL IMPORTANCE IN PROXIMITY TO THE SURVEY AREA

8.3.1 Special Protection Areas (SPAs) - Birds Directive Species

The survey area is situated approximately 3 km due south of the site boundary of the River Shannon and River Fergus Estuaries SPA (004077) which is selected for the conservation of the non- breeding, wintering populations[8] of 21 Special Conservation Interest (SCI) species and for the SCI Wetlands [A999] habitats that are a resource for the regularly-occurring migratory water birds that utilise the SPA. The proposal site is also approximately 10 km to the west of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) which is selected for the conservation of a resident, breeding, population of one SCI species, namely hen harrier (*Circus cyaneus*) [A082][9].

The SCI species for which the River Shannon and River Fergus Estuaries SPA (004077) is selected are:

- Cormorant (*Phalacrocorax carbo*) [A017]
- Whooper swan (*Cygnus cygnus*) [A038]
- Light-bellied brent goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Wigeon (*Anas penelope*) [A050]
- Teal (*Anas crecca*) [A052]
- Pintail (*Anas acuta*) [A054]

[8] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004077.pdf

[9] https://www.npws.ie/protected-sites/spa/004161

- Shoveler (*Anas clypeata*) [A056]
- Scaup (*Aythya marila*) [A062]
- Ringed plover (*Charadrius hiaticula*) [A137]
- Golden plover (*Pluvialis apricaria*) [A140]
- Grey plover (*Pluvialis squatarola*) [A141]
- Lapwing (*Vanellus vanellus*) [A142]
- Knot (*Calidris canutus*) [A143]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed godwit (*Limosa limosa*) [A156]
- Bar-tailed godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Greenshank (*Tringa nebularia*) [A164]
- Black-headed gull (*Chroicocephalus ridibundus*) [A179]

This list includes species from a number of groups including, *inter alia*, swans, geese, waders and gulls. While the foraging or breeding behaviours of most of these populations are not strongly associated with the habitats available in the survey area (NPWS, 2012) it is possible that some of the species do overfly the site when commuting between roosting and foraging grounds.

8.3.2 Important Bird and Biodiversity Areas (IBAs) and Ramsar Sites

8.3.2.1 Important Bird and Biodiversity Areas (IBAs)

The Important Bird and Biodiversity Areas (IBA) Programme is a BirdLife International initiative aimed at identifying and protecting a network of sites critical to the conservation of the world's birds. A total of 140 Important Bird Areas (IBAs) have been identified in Ireland, covering an area of about 4,309 km², equivalent to 6% of the land area. These sites are important for breeding seabirds and for wintering wildfowl.

There are two IBA site within 15km of the survey area, namely the Shannon and Fergus Estuaries (IE08) and The Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle (IBA Criteria C6 (2009)). Shannon and Fergus Estuaries (IE08) is encompassed within the significantly larger River Shannon and River Fergus Estuaries SPA (004077), is one of the most important sites in Ireland for wintering and migrating waterfowl and it supports 10 species in numbers of international importance all which are also protected under the SPA designation. These species are[10]:

- Whooper swan (*C. cygnus*)
- Brent goose (*Branta bernicla*)[11]
- Scaup (*A. marila*)
- Golden plover (*P. apricaria*)
- Knot (*C. canutus*)
- Dunlin (*C. alpina*)
- Black-tailed godwit (*L. limosa*)

[10] http://datazone.birdlife.org/site/factsheet/shannon-and-fergus-estuaries-iba-ireland/details

[11] Light-bellied brent goose, a species for which the SPA site (004077) is selected, is a sub species of brent goose

- Bar-tailed godwit (*L. lapponica*)
- Curlew (*N. arquata*)
- Redshank (*T. totanus*)

A further 13 species occur in numbers of national importance, including, *inter alia*,

- Greylag goose (*Anser anser*)
- Shelduck (*T. tadorna*)
- Wigeon (*A. penelope*)
- Teal (*A. crecca*)
- Pintail (*A. acuta*)
- Shoveler (*A. clypeata*)
- Lapwing (*V. vanellus*)
- Greenshank (*T. nebularia*)[12]

Of these species only greylag goose is not an SCI species for which the River Shannon and River Fergus Estuaries SPA (004077) is selected.

The Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle (IBA Criteria C6 (2009)) is encompassed within the The Stacks to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161), both sites are important for breeding hen harrier (*Circus cyaneus*)[13].

8.3.2.2 Ramsar Sites

The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat is an international treaty for the conservation and sustainable use of wetlands. The Ramsar Convention was ratified by Ireland in 1984 and came into force for Ireland on 15 March 1985. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 hectares.

No Ramsar site is located within 15km of the survey area.

8.4 SPECIES KNOWN FROM THE AREA

On the basis of extensive formal and informal in house expertise the following species are known to be present in the wider geographical area extending away from the survey area:

- Barn owl (*Tyto alba*)
- Kestrel (*F. tinnunculus*)
- Merlin (*Falco columbarius*)
- Mute swan (*Cygnus olor*)
- Sparrowhawk (*A. nisus*)
- Short-eared owl (*Asio flammeus*)

[12] No further information on the other species is provided on the website.

[13]http://datazone.birdlife.org/site/factsheet/stacks-to-mullaghareirk-mountains-west-limerick-and-mount-eagle-iba-ireland/details

A hinterland survey undertaken to inform the previous winter 2018-19 survey detected a waterbird site used by whooper swan comprising agricultural grassland fields about 0.5-1km northwest of the site where a flock of between 11 and 15 individuals were observed on the ground and foraging during the months of six separate dates in February and March 2019.

9 SELECTION OF SURVEY TYPES

As outlined, previously, in **Section 5** compliance with SNH (2017) requires that two main broad survey types are included in the survey design.

- Distribution and Abundance Surveys; and
- Vantage Point (VP) Surveys.

Within these broad types SNH (2017) lists a number of different methodologies and these are outlined hereunder. In each case a site specific assessment is carried out and recommendations are made as to which of the survey types should be carried out.

9.1 DISTRIBUTION AND ABUNDANCE SURVEYS

9.1.1 Moorland Breeding Birds

The site is of limited suitability for breeding waders, skuas, gulls, or red grouse (grouse would have been heard in late winter calling if present) and thus a dedicated survey was not carried out.

9.1.2 Raptors and Owls

Of the four species of owl known in Ireland, namely barn owl (*Tyto alba*), snowy owl (*Nyctea scandiaca*), long-eared owl (*Asio otus*) and short-eared owl (*Asio flammeus*) only barn owl and long-eared owl are purely nocturnal. Surveys for nocturnal species are assessed in **Section 11**, below.

With regard to snowy owl (*Nyctea scandiaca*) it is noted that because this species is a rare winter visitor, mainly to western counties such as Mayo[14], it is not expected to be present. With regard to short-eared owl, it is a scarce winter visitor throughout Ireland and rare breeding species, mainly in the south and east, should it be present in the survey area it is expected that this species and other raptors would be detected by the VP surveys described in **Section 11**, below.

9.1.3 Breeding Divers

This survey type was not required. Only one species from this group is known to breed in Ireland, namely red-throated diver (*Gavia stellata*). Very few pairs do breed in Ireland and those that have bred have been restricted to Co. Donegal[15].

With regard to the likelihood that the other species from this group will frequent the site, the populations of these species are associated with shallow sandy bays and feed on open water plunging to catch fish or other food. Due to the specialised nature of their feeding techniques they are not expected to present at the site due to its terrestrial location and habitat mix.

[14] https://www.birdwatchireland.ie/IrelandsBirds/Owls/SnowyOwl/tabid/1125/Default.aspx

[15] https://www.birdwatchireland.ie/Default.aspx?tabid=125

9.1.4 Woodland Passerines

The site boundary does overlap with a number of commercial conifer plantations. In light of this and bearing in mind that surveys of woodland passerines, especially in commercial conifer forest, are generally not required (SNH, 2017) and because there is very little evidence that passerines are significantly affected by wind farms (DGE, 2014) it was concluded that this survey type was not required. In addition, because the VPs (see **Section 11**, below) are located adjacent to locations that are good examples of the typical, albeit limited, variation in habitats present within the survey area, it was expected that the typical species associated with these habitats and the broader more typical habitats would be detected during the VP surveys.

9.1.5 Nocturnal Species

9.1.5.1 Owls

Of the species of owl resident in Ireland only barn owl and long-eared owl are purely nocturnal. As a result any flights would not be observable and systematic flight path mapping would not be possible, therefore, neither was selected as Target Species. However, extensive in-house experience of the species mix present in the wider geographical area indicates that the survey area could be within the foraging territory of barn owl and, although equivalent knowledge on the presence of long-eared owl is not available, it is considered, on the basis of the precautionary principle, that surveys for both species should be undertaken.

The surveys were conducted, as per SNH (2017) and BirdWatch Ireland[16], by listening for calling birds around dusk from February onwards during winter VP surveys. SNH (2017) further recommends that late evening surveys for calling juveniles in May-July can also be useful in detecting successful pairs; adults may also be active during this time. Should calling birds be detected, in the event that specific breeding sites are identified, surveys can be complemented by searches for signs of occupation, such as moulted feathers and pellets. If present, these evidences of occupancy in the environs of the site can be recorded.

9.1.5.2 Other nocturnal species

Nightjar (*Caprimulgus europaeus*): as this species is a rare summer-visitor to uplands in southern Ireland[17] it was not expected to be present on this site. Surveys were not required.

9.1.6 Lowland and Farmland Birds

Surveys of farmland, moorland or woodland passerines are generally not required (SNH, 2017) and there is very little evidence that passerines are significantly affected by wind farms (DGE, 2014). However, in order to fully characterise the use of the survey area by birds, all species encountered were recorded; however, recording of these species was subsidiary to recording of Target Species and comprised recording of simple counts of species observed only. Because the VPs (see **Section 11**, below) are located adjacent to locations that are good examples of the typical, albeit limited, variation in habitats present within the survey area, it was expected that the typical species associated with these habitats and the broader more typical habitats would be detected during the VP surveys.

[16] https://birdwatchireland.ie/birds/long-eared-owl/

[17] https://birdwatchireland.ie/birds/nightjar/

10 SELECTION OF TARGET SPECIES

Target Species, for which comprehensive data were recorded, were limited to those species likely to be affected by wind farms. The habitat mix within and adjacent to the proposed development site, described in **Section 8.1**, allowed a preliminary assessment to be made, in 2018, prior to commencement of surveys at the site, of the bird populations likely to be present in the study area. This assessment was cognisant of the known habitat preferences of the species evaluated and the restrictions on their distributions that result from these preferences. This assessment when viewed in combination with the information on the proximity of relevant designated sites, outlined in **Section 8.3**, and those species known to be present in the wider area, identified in **Section 8.4**, allowed the selection of primary and, potentially, Secondary Target Species as per SNH (2017). In selecting species for inclusion in the Target Species lists a precautionary approach was adopted and the selection also followed the guidance set out for determining the sensitivity and importance of bird species as outlined in Percival (2003), Whitfield & Madders (2006) and Drewitt & Langston (2006). This evaluation is summarised in **Table 2**

Because there is very little evidence that passerines are significantly affected by wind farms (DGE, 2014; SNH, 2017) and unless rare/restricted passerines are present surveys are not required (SNH, 2017) transects or point counts such as those outlined in Anon (2012) or Bibby *et al*. (2000) were not carried out. However, in order to fully characterise the species mix present in the survey area all species encountered, including passerines, were recorded. However, recording of these species is subsidiary to recording of Target Species and will comprise recording of simple counts of species observed. This element of the survey design is to provide the additional data on bird usage of the site that will be required for subsequent assessments of the impacts on the broad avian biodiversity of the survey area in the event that an application for planning permission is submitted. An example of the survey sheet is included in **Appendix 2**.

Those species selected as Primary Target Species are listed in **Section 10.1** and those selected as Secondary Target Species are listed in **Section 10.2**. The evaluation is summarised in **Table 2**.

10.1 PRIMARY TARGET SPECIES

The Primary Target Species are:

- Hen harrier (*C. cyaneus*)
- Merlin (*F. columbarius*)
- Kestrel (*F. tinnunculus*)
- Sparrowhawk (*A. nisus*)
- Short-eared owl (*A. flammeus*)
- Whooper swan (*C. cygnus*)
- Mute swan (*C. olor*)
- Light-bellied brent goose (*B. bernicla hrota*)
- Greylag goose (*A. anser)*
- Golden plover (*P. apricaria*)
- Lapwing (*V. vanellus*)
- Curlew (*N. arquata*)
- Black-headed gull (*C. ridibundus*)

10.2 SECONDARY TARGET SPECIES

The Secondary Target Species are:

- Cormorant (*P. carbo*)
- Shelduck (*T. tadorna*)
- Wigeon (*A. penelope*)
- Teal (*A. crecca*)
- Pintail (*A. acuta*)
- Shoveler (*A. clypeata*)
- Scaup (*A. marila*)
- Ringed plover (*C. hiaticula*)
- Grey plover (*P. squatarola*)
- Knot (*C. canutus*)
- Dunlin (*C. alpina*)
- Black-tailed godwit (*L. limosa*)
- Bar-tailed godwit (*L. lapponica*)
- Redshank (*T. totanus*)
- Greenshank (*T. nebularia*)
- Snipe (*G. gallinago*)

While not included as Target Species, surveys for the nocturnal barn owl and long-eared owl were conducted as outlined in **Section 9.1.5.1**, above. In the event that either species was observed in daylight then any flight paths observed would be recorded as per **Section 11.1**, below.

Table 2: Target Species Ratings and Rationale for the Ratings Assigned

Raptors & Owls	Target Species Rating	Rationale
Hen harrier (*C. cyaneus*)	Primary	Amber listed. EU Bird Directive Annex I species. Potential foraging and breeding habitat in survey area. Populations are vulnerable to habitat modifications that result from land use change (Wilson *et al.*, 2015). Raptors are among the species known to be most vulnerable to collision mortality at wind farms (Thaxter *et al.*, 2017). The construction and operation of wind turbines can impact on hen harriers (displacement during construction and/or operation; collision with turbines). Known presence in wider geographical area year round[18].
Merlin (*F. columbarius*)	Primary	Amber listed. EU Bird Directive Annex I species. Potential foraging habitat in survey area but unlikely to breed in survey area or in area extending away from survey area. Raptors are among the species known to be most vulnerable to collision mortality at wind farms (Thaxter *et al.*, 2017). Known presence in wider geographical area during winter[18].
Kestrel (*F. tinnunculus*)	Primary	Amber listed. Potential foraging habitat in survey area. Potential breeding habitat in area extending away from survey area. Raptors are among the species known to be most vulnerable to collision mortality at wind farms (Thaxter *et al.*, 2017). Known presence in wider geographical area year round [18].

[18] Known presence based on MWP in-house knowledge and experience.

Sparrowhawk (*A. nisus*)	Primary	Amber listed. EU Bird Directive Annex I species. Potential foraging habitat in survey area. Potential breeding habitat in area extending away from survey area. Raptors are among the species known to be most vulnerable to collision mortality at wind farms (Thaxter *et al.*, 2017). Known presence in wider geographical area year round[18].
Barn owl (*T. alba*)	Not selected	Nocturnal species therefore flight lines not visible. While raptors are among the species known to be most vulnerable to collision mortality at wind farms (Thaxter *et al.*, 2017), barn owls are rarely affected by wind turbines[19].
Long-eared owl (*A. otus*)	Not selected	Nocturnal species therefore flight lines not visible. Potential foraging habitat in survey area. Potential breeding habitat in area extending away from survey area.
Short-eared owl (*A. flammeus*)	Primary	Feeds mainly on small mammals in open habitats. Potential foraging habitat in survey area. Potential breeding habitat in area extending away from survey area. Known presence in wider geographical area[18].
Swans and Geese	**Target Species Rating**	**Rationale**
Whooper swan (*C. cygnus*)	Primary	EU Bird Directive Annex I species. Nationally important population. Proximity of SPA selected for protection of this species. Grassland areas adjacent to the estuary are used by grazing Whooper swans (Robinson *et al.*, 2004). The species is known to forage on grassland sites (Worden *et al.*, 2009) during the day. Possibility that the species overflies or transects through the survey area when commuting to foraging grounds further inland. Known poor flight manoeuvrability.

[19] https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/

Mute swan (*C. olor*)	Primary	Known presence in wider geographical area [18]. Possibility, albeit slight, that the species' flight lines intersect through the survey area when commuting between foraging grounds. Precautionary principle. Known poor flight manoeuvrability.
Light-bellied brent goose (*B. bernicla hrota*)	Primary	EU Bird Directive Annex I species. Internationally important population[20]. Proximity of SPA selected for protection of this species. Possibility, albeit slight, that the species' flight lines intersect through the survey area. Known poor flight manoeuvrability.
Greylag goose (*A. anser)*	Primary	Proximity of IBA selected for protection of this species. Possibility, albeit slight, that the species' flight lines intersect with the survey area. Known poor flight manoeuvrability. Precautionary principle.
Cormorants	Target Species Rating	Rationale
Cormorant (*P. carbo*)	Secondary	EU Bird Directive Annex I species. Nationally important migratory population. Nationally important resident breeding population. Proximity of SPA selected for protection of this species. Possibility that the species' flight lines intersect with the survey area.
Ducks	Target Species Rating	Rationale
Amber listed: Shelduck (*T. tadorna*) Scaup (*A. marila*) Teal (*A. crecca*)	Secondary	Notwithstanding the proximity of SPA selected for protection of these species and the national importance of the populations for which the SPA is selected, all are exclusively associated with open water habitats not present within the survey area or in the area extending away from it. Very limited likelihood that the species' flight lines intersect with the survey area.

[20] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004077.pdf

Red listed: Pintail (*A. acuta*) Shoveler (*A. clypeata*) Wigeon (*A. penelope*)		
Waders	Target Species Rating	Rationale
Golden plover (*P. apricaria*)	Primary	Red listed. EU Bird Directive Annex I species. Nationally important population. Proximity of SPA selected for protection of species. Possibility that the species overflies or transects through the survey area. Potential foraging habitat in survey area but unlikely to breed in survey area or in area extending away from survey area. Known presence in wider geographical area in winter[18].
Curlew (*N. arquata*)	Primary	Red listed; EU Bird Directive Annex I species. Nationally important population. Proximity of SPA selected for protection of species. Possibility that the species overflies or transects through the survey area. Potential foraging habitat in area extending away from survey area survey area but unlikely to breed in survey area or in area extending away from survey area. Known presence in wider geographical area[18].

Lapwing (*V. vanellus*)	Primary	Red listed. EU Bird Directive Annex I species. Nationally important population. Proximity of SPA selected for protection of species. Possibility that the species overflies or transects through the survey area to foraging grounds where the variety of soil and surface-living invertebrates this species predates are available. Potential foraging habitat in area extending away from survey area survey area but unlikely to breed in survey area or in area extending away from survey area.
Green listed: Ringed plover (*C. hiaticula*) Greenshank (*T. nebularia*) **Amber listed:** Grey plover (*P. squatarola*)] Knot (*C. canutus*) Black-tailed godwit (*L. limosa*) Bar-tailed godwit (*L. lapponica*) **Red listed:** Dunlin (*C. alpina*) Redshank (*T. totanus*)	Secondary	Notwithstanding the proximity of SPA selected for protection of these species and the international and national importance of the populations for which the SPA is selected, all are essentially obligate feeders on marine and estuarine benthic invertebrates. Very limited likelihood that the species' flight lines intersect with the survey area.
Gulls	Target Species Rating	Rationale

Black-headed gull (*C. ridibundus*	Primary	Red listed. EU Bird Directive Annex I species. Proximity of SPA selected for protection of species. Nationally important population. Possibility that the species overflies or transects through the survey area to alternative foraging grounds inland from the estuary.

11 VANTAGE POINT (VP) SURVEYS

VP surveys are designed to quantify the level of flight activity and its distribution over a survey area (SNH, 2017). The survey type comprises a series of watches from fixed locations that are repeated on a scheduled basis that are focused on recording flight behaviours that intersect with the turbine rotor envelope. The aim of the survey design is to set out a standard methodology for recording both the quantitative and qualitative aspects of these behaviours in order to produce sufficient information to assess the potential effects of the development on Target Species particularly with regard to collision risk. It also allows a determination to be made as to whether regular flight lines for any species intersect with the survey area.

Vantage Point surveys allow the collection of accurate data on Target Species that will enable estimates to be made of:

- The time spent flying over the survey area;
- The relative use of different parts of the survey area; and
- The proportion of flying time spent within the upper and lower height limits as determined by the rotor diameter and the hub height.

On the basis of extensive local knowledge and experience of the distribution of hen harrier in the north Kerry area and due to the proximity of an SPA designated for the protection of this species, VP surveys were required (SNH, 2017). To this end surveys from three VP locations were conducted during the survey period. The VPs, shown in **Figure 5** were selected to ensure that the fields of view covered all of the flight activity within the survey area (500m buffer) and are located such that no point within the survey area is greater than 2 km from a VP. When selecting the VP locations the visibility of the rotor swept area is critical; visibility at ground level is not. However, due to the almost uninterrupted fields of view afforded by the relatively flat topography of the site visibility to ground level is possible over much of the site. As per SNH (2017) 36 hours per VP were completed during the survey period.

Because bird species have varied seasonal, and within day, activity patterns the timing of survey sessions were adjusted to occur at times when birds are likely to be most active. Because bird flight behaviours change in response to wind conditions, particularly with regard to flight heights, weather will also be a factor in the scheduling of surveys.

The VP methodology outlined in **Section 11.1** also followed the NPWS Recommended Methodology for Assessment of Impacts of Proposed Windfarms included in **Appendix 1.** While the primary focus of the VP surveys were the Target Species listed in **Section 10** all species encountered were recorded on a presence/absence basis on separate field sheets (see **Appendix 2**).

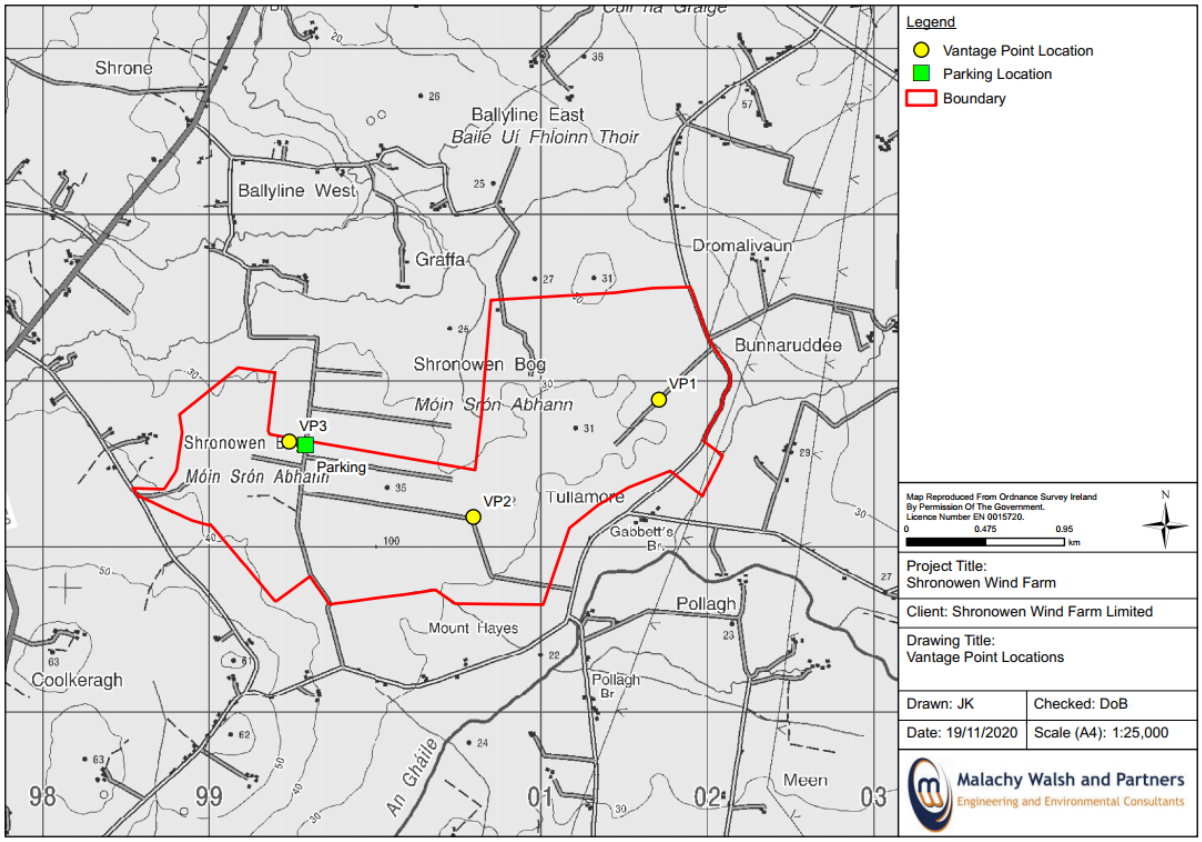


Figure 5: VP Locations

11.1 VANTAGE POINT (VP) METHODOLOGY

The methodology is of particular use in providing details of the number of species and the extent to which birds use the site. It also provides supplementary information on flight activity and behaviour. The longer the overall survey period of VP surveys, the more accurate and precise the sample of flight behaviour.

Three VPs are located at positions that provide clear views of turbine hub heights and blade swept area over the survey area. The surveyors will base themselves at each VP for a fixed period of 6 hours on one day of each month of the survey period. VP sessions will be conducted as a series of watches each of not more than 3 hours continuous duration at a time. There will be breaks of at least 30 minutes between watches to minimise observer fatigue and a short 'settling in' period of approximately 10 minutes at each VP, before watches start, to allow the surveyor to organise and annotate field sheets, mapping, etc. and to ensure any disturbance from moving around the site has passed. All VP's will be visited monthly during the survey period.

VP watches will be taken under conditions of good ground visibility (>2km) on days when the cloud base is high enough to allow observation of the full survey area. In order to ensure that any activity by soaring birds is sampled, surveys will be undertaken in a range of wind conditions; surveys will also occur on showery days providing showers are not too heavy or prolonged. For each sighting of a primary target species in flight the following will be recorded:

- The time that the bird was located and the duration of the observation;
- Sex and age of the bird(s), if possible;
- Behaviour observed such as foraging, commuting or displaying;

- Estimation of flight height;
- Habitats used during flight observation period; and
- Weather conditions at time of sighting.

From the point when an individual was detected it was followed until it ceased flying or was lost from view. The time of initial detection and the flight duration was recorded and the flight path followed was plotted, in the field, onto OSI 1:50 000 mapping. The bird's flight height was estimated at the time of detection and then at evenly spaced intervals thereafter. In order to avoid observer error narrow height bands were not used and flight heights were classified into height bands that can be used in post survey analysis to characterise and describe the flights.

Observations of Target Species took priority over completion of activity summaries. The survey sheet (See **Appendix 2**) is designed to facilitate data entry and allows for the addition of brief notes summarising the flight behaviours. These can subsequently be used to provide qualitative descriptions of the behaviour. Entry of this information was facilitated by use of the codes outlined in **Sections 11.1.1** and **11.1.2**.

Static birds, such as those that are perched were to be recorded on the sheets and the location marked on a map. For clarity, and for ease of post survey analysis, individual flight paths were recorded on separate maps and observation sheets.

11.1.1 Behaviour Codes[21]

The following codes will be used in the survey sheets to indicate the behaviours observed for each sighting:

- (H) Hunting
- (F) Flying
- (S) Soaring
- (C) Circling
- (P) Perched
- (G) On Ground
- (M) Mobbing
- (D) Display
- (FP) Male
- (O) Other

11.1.2 Habitat Codes[22]

The following codes will be used in the survey sheets to indicate the habitats transected by each flight path:

- IG - Improved grazing
- S - Scrub
- B - Bog
- RG - Rough grazing
- G - Grass moorland

[21] Derived from Irish Hen Harrier Survey 2015 Survey & recording guidelines for contributors

- 1F - First rotation forest
- 2F - Second rotation forest
- T - Thicket (or pole) stage forest
- CF - Clear fell
- H - Heather moorland
- O - Other (please specify)

12 RESULTS

Two primary target species and one secondary target species were recorded during the survey period. These are, as follows:

- Primary Target Species:
  - Hen harrier (*C. cyaneus*)
  - Kestrel (*F. tinnunculus*)

- Secondary Target Species
  - Snipe (*G. gallinago*)

In addition, non target species namely, mallard (*A. platyrhynchos*), buzzard (*B. buteo*), little egret (*E.garzetta*), lesser black-backed gull (*L. fuscus*) and unidentified gull's were also recorded.

12.1 PRIMARY TARGET SPECIES

12.1.1 Hen harrier Observations

Four observations of this species were recorded during the breeding survey period. Two of these were of an adult male, one was of an adult female and the remaining bird was categorised as a juvenile female. The flight paths were observed from VP1, VP2 and VP3 during the months of April, June, July and September. They were observed flying, circling, hunting and perched over bog mainly but also over 1st rotation forestry, scrub and grassland moorland. Three flights paths were recorded within the site boundary and flight heights were within 0-150m.

These flight paths are illustrated in **Figure 6 Drawing No. Map 1 Ref C** This drawing (**Drawing No. Map 1 Ref C)** is also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 5**, below. The total time of observations is shown in **Table 3**, below and the characteristics of the flights recorded are summarised in **Table 5**, below. Descriptions of the behaviors recorded are included in **Section 12.1.1.1** to **Section 12.1.1.4**, below. A discussion of the survey results is included in **Section 13**, below.

Table 3: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	30
VP2	252
VP3	130
Total	412

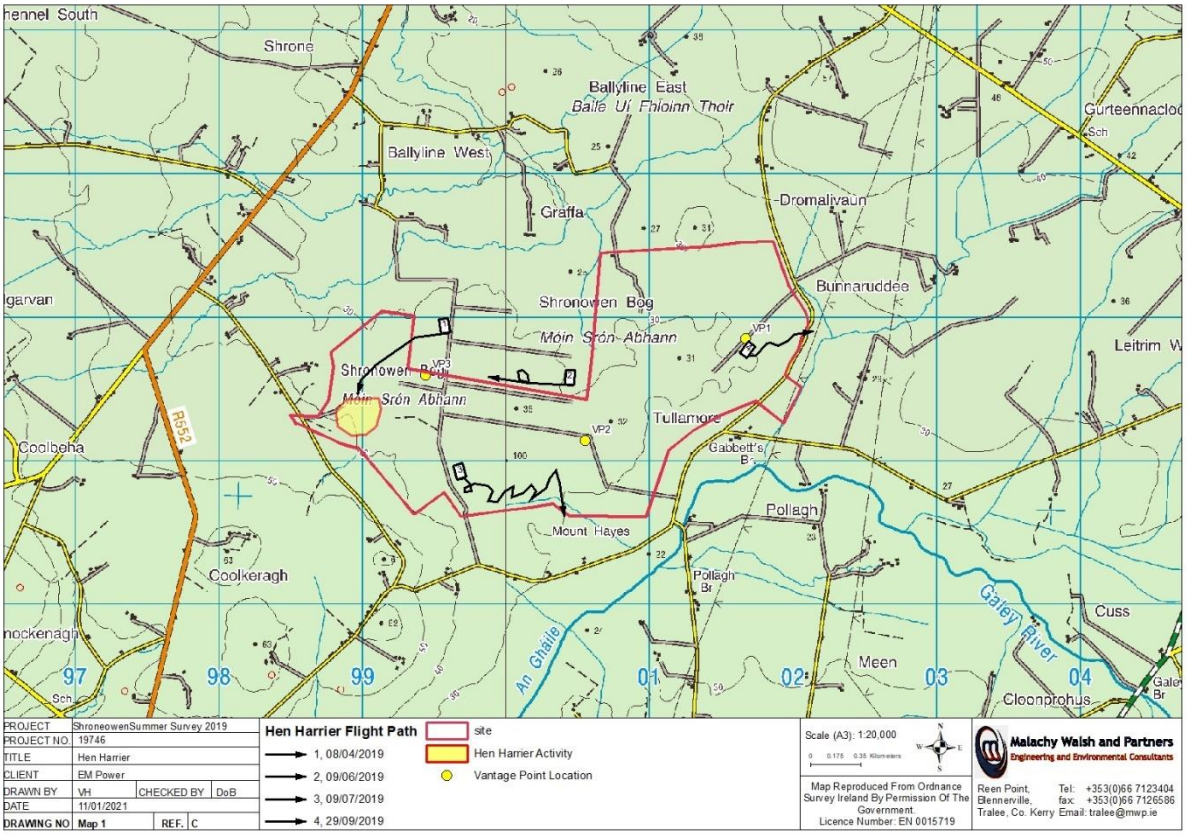


Figure 6: Hen harrier flight paths

12.1.1.1 VP3 (April 8th) Flight Path 1

An adult female hen harrier was observation and recorded on this date at 11:53. This hen harrier was first observed flying through the site at 20m height, falling as she continued in a south westerly direction and was lost to sight behind willow trees. This female then came up from the bog and circled twice at >100m for approximately one minute each time at 12:15 and 12:37. These observations were made to the north and west of VP3. The majority of this activity was observed inside the site boundary.

12.1.1.2 VP2 (June 9th) Flight Path 2

At 14:00 an adult male was observed north west of VP2. This male with pure white plumage was observed flying at a leisurely pace c.1m above ground and was lost to sight behind an undulation in the bog surface. This activity was observed outside the site boundary.

12.1.1.3 VP2 (July 9th, 2019) Flight Path 3

At 12:22 a juvenile female hen harrier was observed. It was first seen west south west of VP2 hunting c. 1km away. It was difficult for the surveyor to decipher the height and habitat. This bird had no distinctive barred tail but may have had it, indicating it is possibly a juvenile bird. Again, distance was a factor in deciphering this. Thereafter a series of hovering and repositioning occurred; the hen harrier headed deliberately to a verge of conifer plantation and perched on a spruce tree. She then flew into the grassland moorland/bog a short distance from the perch. This occurred to the south west of VP2 and the bird then flew in an easterly and then south easterly direction. This activity was observed inside the site boundary and flight heights ranged from 0m-100m.

12.1.1.4 VP1 (September 29th) Flight Path 4

At 14:06 an adult male was observed hunting and flying low (<10m) and slowly over bog and shrub habitat. This flight was observed south of VP1 and the hen harrier was flying in a north westerly direction. This activity was observed inside the site boundary.

12.1.2 Kestrel Observations

In total there were 14 observations of kestrel during the breeding survey period. The majority of the activity was observed from VP1. Kestrels were observed during the month of June to September. The kestrels were observed flying at various heights ranging from 0m-50m and the majority of the activity was observed inside the site boundary. These were seen within the bog habitat mainly but also in scrub, improved grassland, 1st rotation forestry, grassland moorland and bog track. The activities observed over these habitats include flying and hunting mainly, perched, soaring, being mobbed and circling.

The flight characteristics are summarised in **Table 6**, below and the observations are described in **Section 12.1.2.1** to **Section 12.1.2.14**, inclusive, below. These flight paths are illustrated in **Figure 7** and **Figure 8** . These drawings (**Drawing Kestrel Map 1 and Map 2 Ref C)** are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 6,** below. The total time of observations is shown in **Table 4**. A discussion of the survey results is included in **Section 13**, below.

Table 4: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	592
VP2	55
VP3	490
Total	1,137

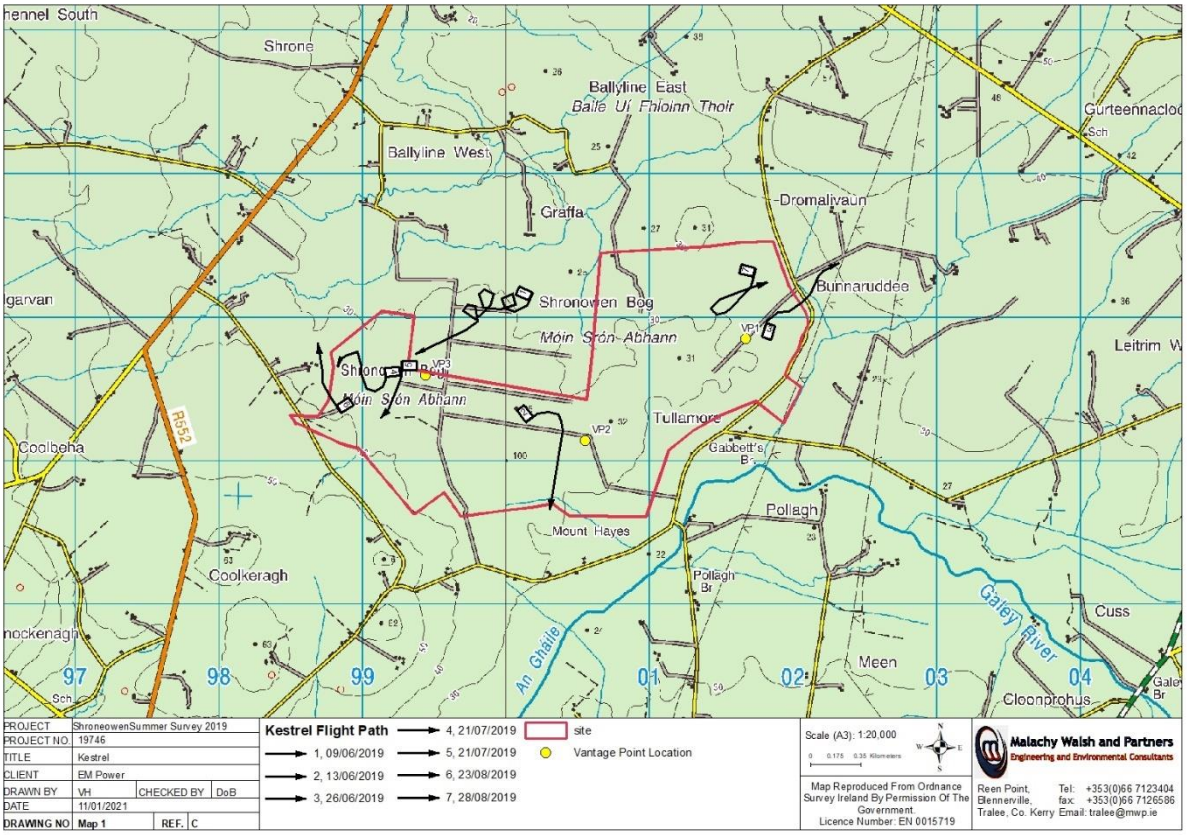


Figure 7: Kestrel flight paths Map 1

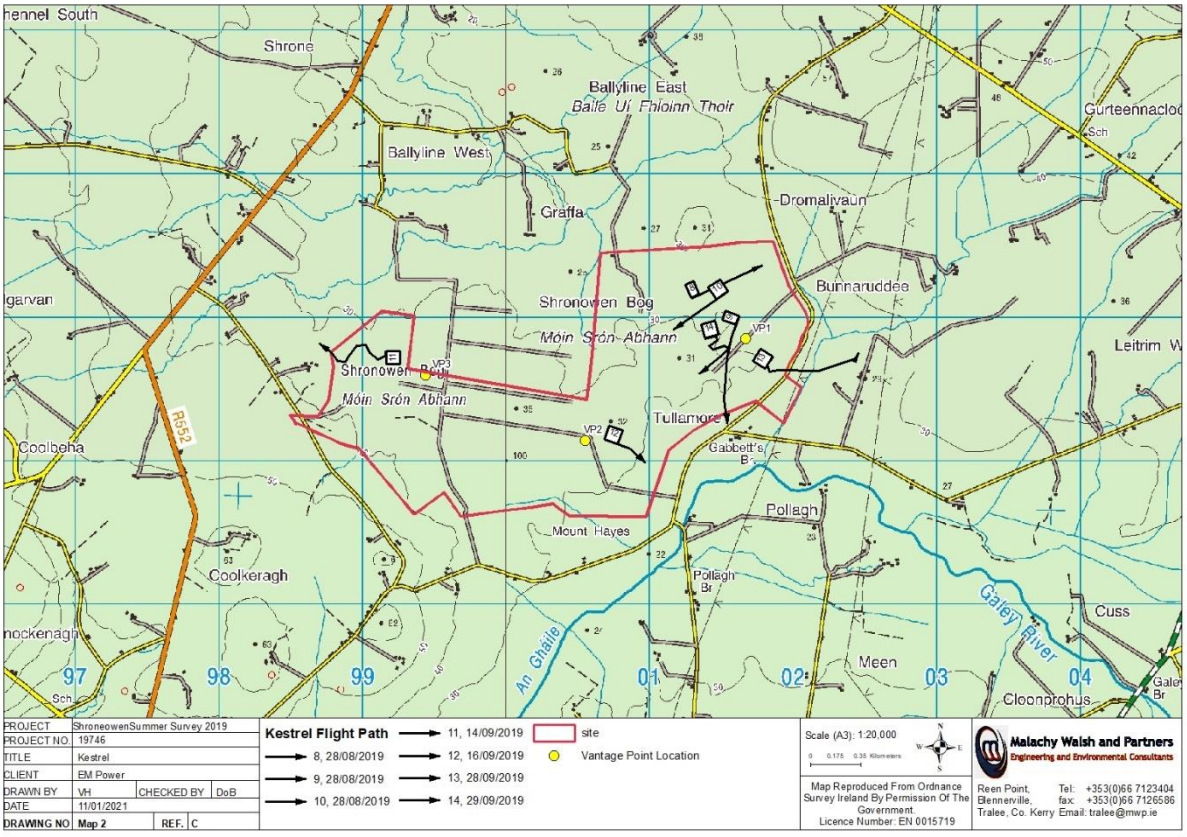


Figure 8: Kestrel flight paths Map 2

12.1.2.1 VP3 (June 9th) Flight Path 1

At 15:14 an adult kestrel was observed flying, soaring, circling and hunting in a south westerly direction to the north east of VP3 20m-50m over bog. This was observed outside the site boundary.

12.1.2.2 VP1 (June 13th) Flight Path 2

At 15:29 an adult kestrel was observed as it flew over bog and a heavily grazed bog track. This kestrel was observed hunting at c.10m above the heavily grazed bog track. It then went to the ground and after a brief flurry of activity (possibly a struggle with prey) the bird alighted and perched briefly on a tree stump adjacent to the track. Shortly after, the bird flew off to the south close to the ground c.1m height and at speed. It then flew off in a southerly direction west of VP2 and was lost to sight behind a fold in the ground. This was observed within the site boundary.

12.1.2.3 VP1 (June 26th) Flight Path 3

At 20:30 a pair or young kestrel were observed on a small heap of drying turf to the north east of VP1. They flew together towards the perch site to the north west. Here they remained together while perched and flew off to the east together. This flight was observed at heights between 0m-50m and occurred inside the site boundary.

12.1.2.4 VP3 (July 21st) Flight Path 4

At 08:00 a kestrel was observed flying and hunting over bog and a scrub to the west of VP3. It flew in a southerly and then north westerly direction, it dropped behind willow trees and was lost to sight. This flight was observed at heights between 0m-20m and this was observed within the site boundary.

12.1.2.5 VP3 (July 21st) Flight Path 5

At 09:23 an adult male kestrel was observed hunting over bog at 0m-20m height to the north-west of VP3. This kestrel flew south-east and then south of VP3 within the site boundary.

12.1.2.6 VP3 (August 23rd) Flight Path 6

At 10:04 a kestrel was observed flying over 1st rotation forestry. It was then seen hunting and mobbed by swallows over improved grassland and 1st rotation forestry. This kestrel was observed to the west of VP3 flying in a northerly direction. It flew between 0m-40m height and this was observed within the site boundary.

12.1.2.7 VP1 (August 28th) Flight Path 7

At 12:16 a kestrel was observed flying and hunting over bog at 20m-50m height. This kestrel hunted over the bog and joined a second kestrel and then flew away quickly in a north easterly direction. This activity was observed within the site boundary.

12.1.2.8 VP1 (August 28th) Flight Path 8

At 12:18 a kestrel was observed flying and hunting over bog habitat. This kestrel was initially spotted as another kestrel flew over, it hunted briefly and then flew away. It was first observed to the north west of VP1 and flew in a north easterly direction. This activity was observed at heights between 0m-20m. This activity was observed within the site boundary.

12.1.2.9 VP1 (August 28th) Flight Path 9

At 13:00 an adult female kestrel was observed flying over bog habitat. It was first observed north-west of VP1. It flew south and then in a south easterly direction. This flight was observed at heights between 0m-50m. This activity was observed inside the site boundary.

12.1.2.10 VP1 (August 28th, 2019) Flight Path 10

At 13:05 an adult male kestrel was observed hunting over bog habitat. It was first observed north-west of VP1. It flew in a south westerly direction it dived into the heathers twice and was lost to sight the second time behind a ridge. This hunting was observed at heights between 0m-20m. This activity was observed within the site boundary.

12.1.2.11 VP3 (September 14th) Flight Path 11

At 13:42 an adult male kestrel was observed hunting and flying over the bog, scrub and 1st rotation forestry habitats. This was observed west of VP3 where the kestrel flew in a north westerly direction and was last seen over the 1st rotation forestry. This activity was observed at heights between 0m-50m and within the site boundary.

12.1.2.12 VP2 (September 16th) Flight Path 12

At 14:25 an adult kestrel was observed hunting over the bog and scrub habitat. It was mobbed by three swallows and flew away and was lost to sight behind willow trees. This was observed to the east of VP2 and the kestrel flew off in a south easterly direction. This flight was observed at heights between 0m-50m and within and outside of the site boundary.

12.1.2.13 VP1 (September 28th) Flight Path 13

At 11:10 a kestrel was observed being mobbed by 15-20 small passerines. It flew over bog and scrub to the south east of VP1, flying in an easterly direction until it was lost to sight behind trees. This flight was observed at heights between 0m-20m inside the site boundary.

12.1.2.14 VP1 (September 29th) Flight Path 14

At 14:08 an adult female kestrel was observed hunting over the bog habitat at 20m-25m height. This was observed to the south west of VP1 and the kestrel flew off in a south westerly direction. This activity was observed within the site boundary.

12.1.3 Whooper swan Observations

Whooper swan were not observed during this breeding survey. On the 10th and 11th of April the site where whooper swan had previously been observed was surveyed. On these dates no whooper swans were observed and cattle were seen grazing in this improved grassland.

Table 5: Summary characteristics of hen harrier flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/ age	Duration of observation (seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	08/04/19	3	11:53 12:15 12:37	Female/ Adult	10 60 60	Flying Circling Circling	0-20m 100-150m 100-150m	Bog and Scrub Bog Bog
2	Map 1 Ref C	09/06/19	2	14:00	Male/Adult	32	Flying	0-20m	Bog
3	Map 1 Ref C	09/07/19	2	12:22	Female/ Juvenile	40 30 150	Perched Flying Hunting	0-20m 20-50m 50-100m	1st rotation forestry Bog 1st rotation forestry and grassland moorland
4	Map 1 Ref C	29/09/19	1	14:06	Male/Adult	30	Hunting	0-20m	Bog and Scrub

Table 6: Summary characteristics of kestrel flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	09/06/19	2	15:14	Unknown/ Adult	50	Flying, soaring, circling and hunting	20-50m	Bog

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
2	Map 1 Ref C	13/06/19	1	15:29	Unknown/ Adult	23 11 13	Hunting Perched Flying	0-20m 0-20m 0-20m	Heavily grazed bog track Bog Bog
3	Map 1 Ref C	26/06/19	1	20:30	Young pair	100 80	Perched Flying	0-20m 20-50m	Bog Bog and grassland moorland
4	Map 1 Ref C	21/07/19	3	08:00	Unknown	180	Flying and hunting	0-20m	Bog and scrub
5	Map 1 Map 1 Ref C	21/07/19	3	09:23	Male/Adult	40	Hunting	0-20m	Bog
6	Map 1 Ref C	23/08/19	3	10:04	Unknown	5 125	Flying Hunting and mobbed	0-20m 20-50m	1st rotation forestry Improved grassland and 1st rotation forestry
7	Map 2 Ref C	28/08/19	1	12:16	Unknown	120	Flying and hunting	20-50m	Bog
8	Map 2 Ref C	28/08/19	1	12:18	Unknown	120	Flying and hunting	20-50m	Bog
9	Map 2 Ref C	28/08/19	1	13:00	Female/ Adult	10 30	Flying Flying	0-20m 20-50m	Bog Bog
10	Map 2 Ref C	28/08/19	1	13:05	Male/Adult	30	Hunting	0-20m	Bog
11	Map 2 Ref C	14/09/19	3	13:42	Male/Adult	20 120	Hunting Flying and hunting	0-20m 20-50m	Bog and scrub Bog, scrub and 1st rotation forestry

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
12	Map 2 Ref C	16/09/19	2	14:25	Unknown/ Adult	5 30	Mobbed Hunting and mobbed	0-20m 20-50m	Bog and scrub Bog and scrub
13	Map 2 Ref C	28/09/19	1	11:10	Unknown	15	Mobbed	0-20m	Bog and scrub
14	Map 2 Ref C	29/09/19	1	14:08	Female/ Adult	40	Hunting	20-50m	Bog

Table 7: Summary characteristics of whooper swan flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
/	/	10/04/19	/	09:30-17:30	/	/	/	/	Cattle grazing on Improved grassland
/	/	11/04/19	/	09:15	/	/	/	/	Cattle grazing on Improved grassland

12.2 SECONDARY TARGET SPECIES

12.2.1 Snipe Observations

There were two sightings of adult snipe during this survey period. The flight paths observed were all on the eastern side of the site from VP2 and these snipe were flying over bog and scrub at heights between 0m-20m. These observations were made in April and September.

The total time of observations is shown in **Table 8**, below. The flight characteristics are summarised in **Table 9**, below and the observations are described in **Section 12.2.1.1** to **Section 12.2.1.2,** inclusive, below. The flight paths are illustrated in **Figure 9**/**Drawing Map 1 Ref C** is also included in A4 format in **Appendix 5**. The flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 9**, below. A discussion of the survey results is included in **Section 13**, below.

Table 8: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	0
VP2	30
VP3	0
Total	30

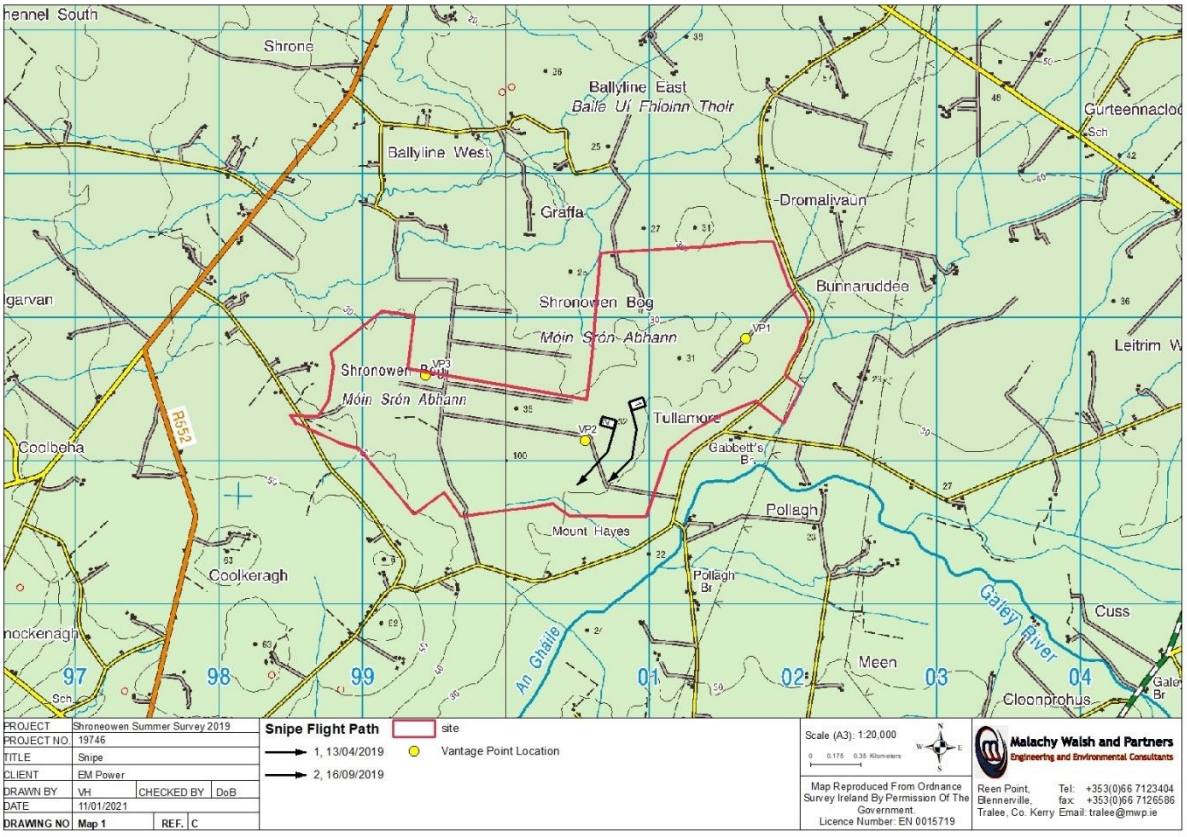


Figure 9: Snipe flight paths Map 1

12.2.1.1 VP2 (April 13th) Flight Path 1

At 10:17, seven adult snipe were observed flying low across the bog. They were observed to the north east and flew east of VP2 in a south westerly direction within the site boundary.

12.2.1.2 VP2 (September 16th) Flight Path 2

At 14:43 a snipe was observed flying though the site over bog and scrub. It was observed north east of VP2 outside of the site boundary flying in a south westerly direction into the site boundary.

Table 9: Summary characteristics of snipe flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/ age	Duration of observation (seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	13/04/19	2	10:17	Unknown/ Adult	10	Flying	0- 20m	Bog
2	Map 1 Ref C	16/09/19	2	14:43	Unknown	20	Flying	20-50m	Bog and scrub

12.3 OTHER SPECIES OBSERVED

12.3.1 Mallard Observations

In total there were four observations of mallard made during the breeding survey period. These observations were made from VP2 location mainly within the site boundary. Mallard appeared in April and May only and flight heights fall within 0m-50m. They were observed flying over bog habitat.

The total time of observation is shown in **Table 10**, below. The flight characteristics are summarised in **Table 15**, below and the observations are described in **Section 12.3.1.1** to **Section 12.3.1.4**, below. The flight paths are illustrated in **Figure 10/Drawing Map 1 Ref C** below. These drawings are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 15**, below. A discussion of the survey results is included in **Section 13**, below.

Table 10: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	0
VP2	214
VP3	0
Total	214

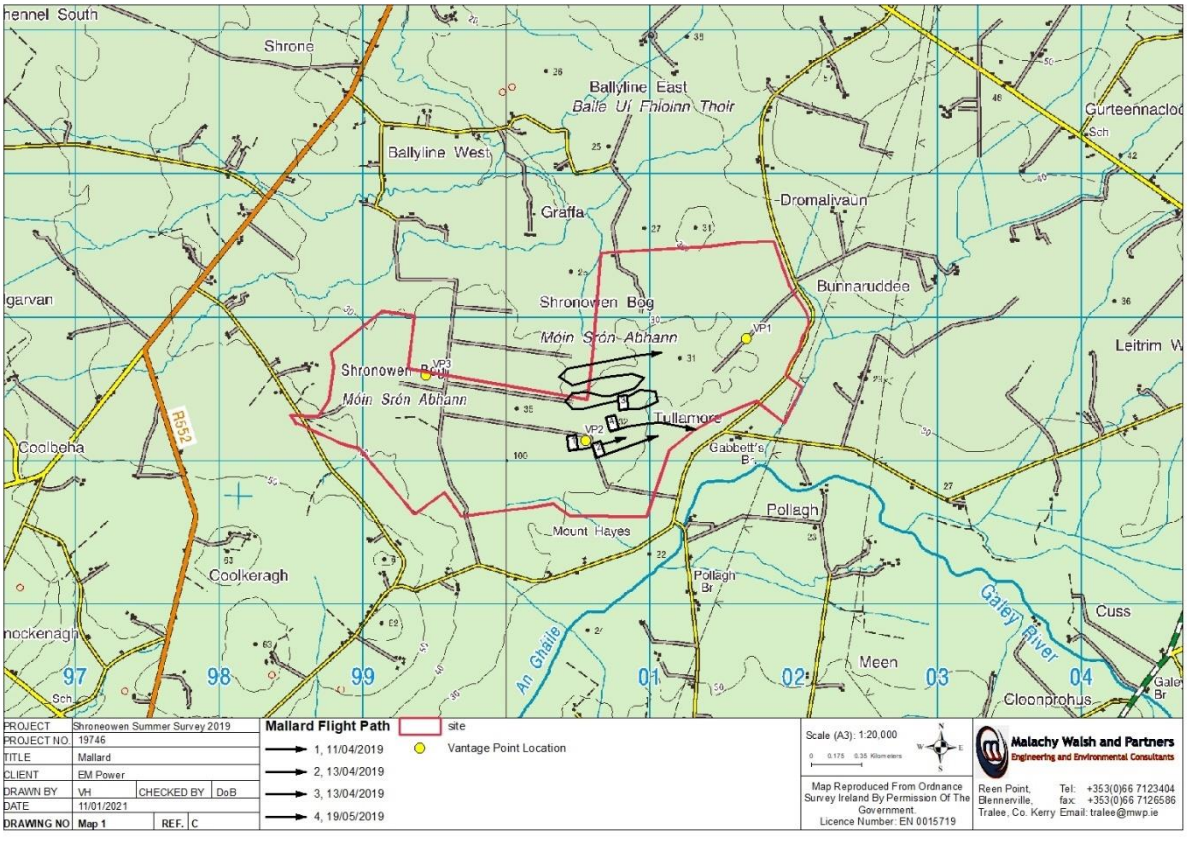


Figure 10: Mallard flight paths Map 1

12.3.1.1 VP2 (April 11th) Flight Path 1

At 12:25, two adult female mallards were observed flying through the site. These were observed to the south west of VP2 flying over bog habitat in an easterly direction.

12.3.1.2 VP2 (April 13th) Flight Path 2

At 10:36 a pair of adult mallards were observed flying through the site. These were observed to the south east of VP2 flying over bog habitat in a north easterly direction.

12.3.1.3 VP2 (April 13th) Flight Path 3

At 11:05, two female and one male adult mallards were observed flying through the site. These were observed to the north east of VP2 flying over bog habitat, they flew north to the east and west over and back until they were lost to sight flying in an easterly direction.

12.3.1.4 VP2 (May 19th) Flight Path 4

At 10:34 an adult pair of mallard were observed flying through the site. These were observed to the east of VP2 flying over bog habitat in an easterly direction.

12.3.2 Buzzard Observations

In total there was one observation of buzzard made during the survey period. This observation was made from VP1 location. Buzzard appeared in April only and flight heights fall within 50m- >150m. This buzzard was observed flying over 1st rotation forest and heather moorland within the site boundary.

The total time of observation is shown in **Table 11**, below. The flight characteristics are summarised in **Table 16**, below and the observation is described in **Section 12.3.2.1**, below. The flight path is illustrated in **Figure 11/Drawing Map 1 Ref C** below. These drawings are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 16**, below. A discussion of the survey results is included in **Section 13**, below.

Table 11: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	420
VP2	0
VP3	0
Total	420

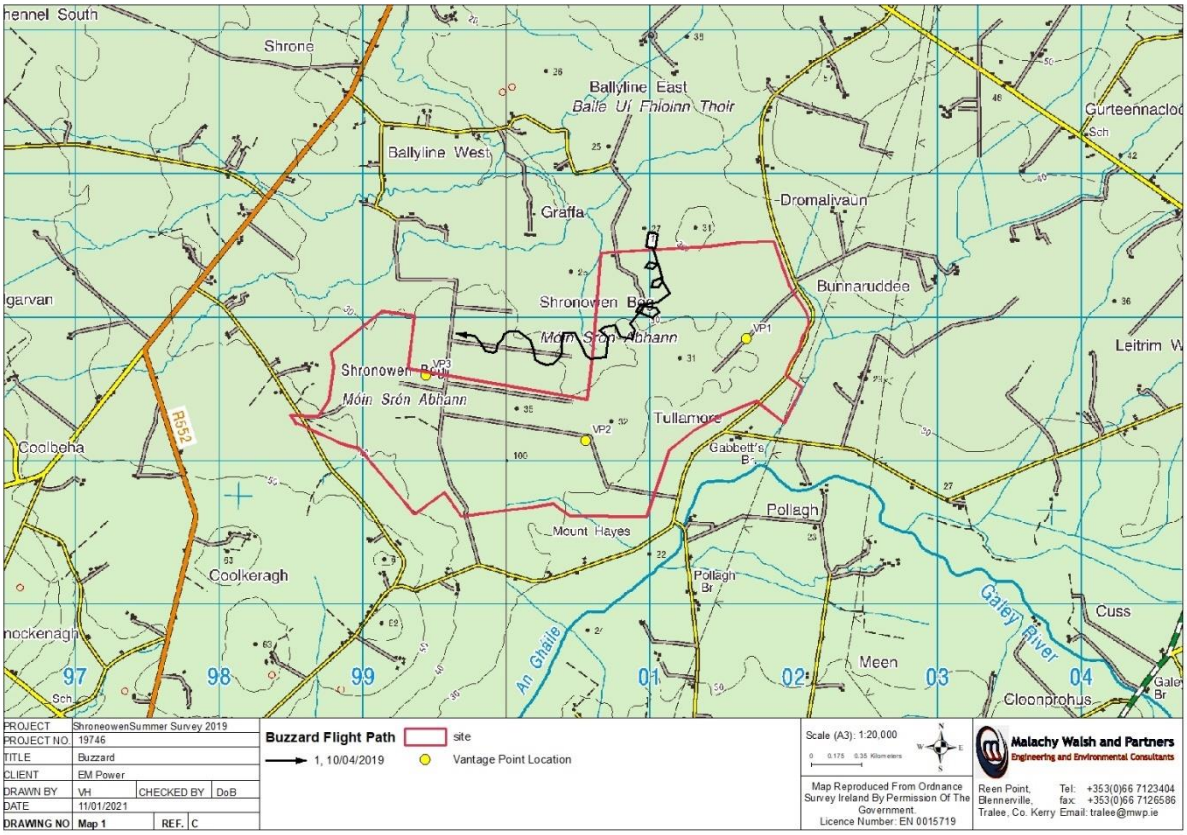


Figure 11: Buzzard flight paths Map 1

12.3.2.1 VP1 (April 10th) Flight Path 1

At 12.30 a male buzzard was observed mobbing other birds and soaring through the site within the site boundary. This was observed from the north east of the site to the north west of VP1. This buzzard flew over 1st rotation forest and heather moorland in a south westerly direction.

12.3.3 Little egret Observations

In total there were two observations of little egret made during the survey period. These observations were made from VP3 location. Little egret appeared in May and July only and flight heights fall within 0m-50m. They were observed flying over bog, scrub and 1st rotation forestry within the site boundary.

The total time of observation is shown in **Table 12**, below. The flight characteristics are summarised in **Table 17**, below and the observations are described in **Section 12.3.3.1** to **12.3.3.2** below. The flight paths are illustrated in **Figure 12/Drawing Map 1 Ref C** below. These drawings are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1, **Table 17**, below. A discussion of the survey results is included in **Section 13**, below.

Table 12: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	0
VP2	0
VP3	35
Total	

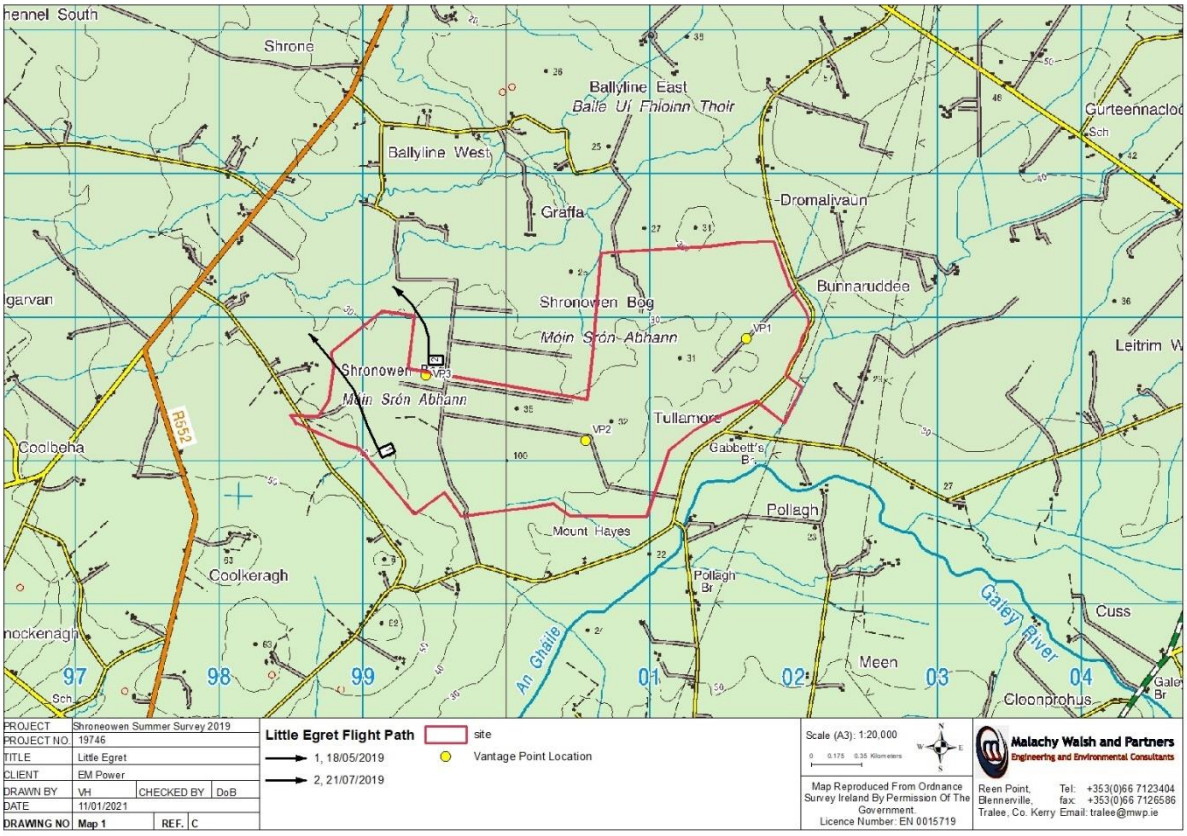


Figure 12: Little egret flight paths Map 1

12.3.3.1 VP3 (May 18th) Flight Path 1

At 14:45 a little egret was observed flying within the site boundary to the west. This little egret was observed to the south-west of VP3 flying over bog, scrub and 1st rotation forestry in a north westerly direction.

12.3.3.2 VP3 (July 21st) Flight Path 2

At 16:47 a little egret was observed flying north of VP3 outside the site boundary. This little egret was observed flying in a north westerly direction over bog and scrub habitat. The little egret flew from outside the site to within the site boundary.

12.3.4 Lesser black-backed gull Observations

In total there were two observations of lesser black-backed gull (LBBG) made during the survey period. These observations were made from VP1 and VP3 location and occurred within and outside the site boundary. LBBG appeared in June only and flight heights fall within 20m-100m. They were observed flying over bog, 1st rotation forestry and grassland moorland.

The total time of observation is shown in

Table 13, below. The flight characteristics are summarised in **Table 18,** below and the observations are described in **Section 12.3.4.1** to **Section 12.3.4.2**, below. The flight paths are illustrated in **Figure 13/Drawing Map 1 Ref C** below. These drawings are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path

numbers found in Column 1, **Table 18**, below. A discussion of the survey results is included in **Section 13**, below.

Table 13: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	170
VP2	0
VP3	60
Total	230

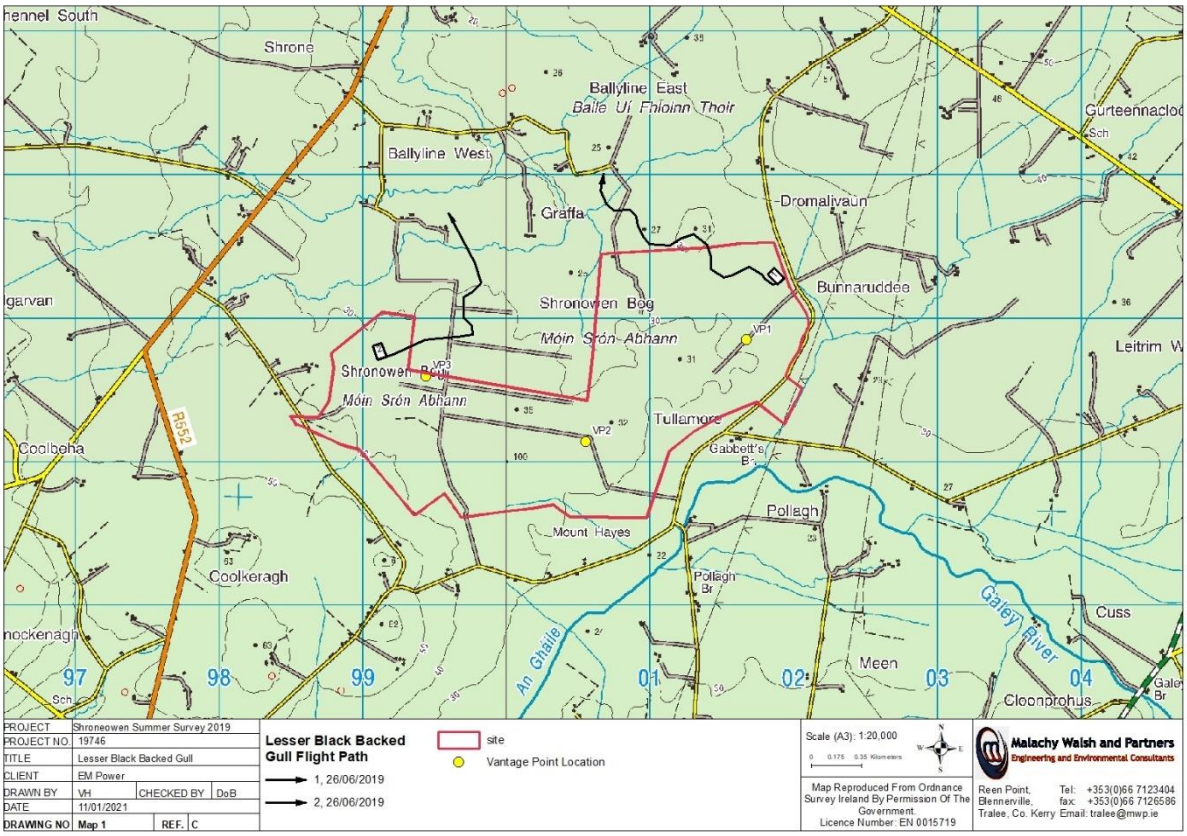


Figure 13: LBBG flight paths Map 1

12.3.4.1 VP1 (June 26th) Flight Path 1

At 19:00 a LBBG was observed flying through the site. This gull was observed flying over bog and 1st rotation forestry to the north east of VP1 in a north westerly direction. This gull was flying within and outside the site boundary.

12.3.4.2 VP3 (June 26th) Flight Path 2

At 17:40 one LBBG was observed flying through the site. This was observed to the north west of VP3 it flew easterly and then north flying over grassland moorland and bog habitat. This gull was flying within the site and then flew outside the site boundary.

12.3.5 Unidentified gull, Observations

In total there were two observation of unidentified gull made during the survey period. These observations were made from VP1 location. Unidentified gull appeared in June only and flight heights fall within 20m-50m. They were observed flying over bog habitat in the north east of the site, within and outside the site boundary.

The total time of observation is shown in **Table 14**, below. The flight characteristics are summarised in **Table 19,** below and the observations are described in **Section 12.3.5.1** to **12.3.5.2**, below. The flight paths are illustrated in **Figure 14**/**Drawing Map 1 Ref C** below. These drawings are also included in A4 format in **Appendix 5**. Individual flight paths are numbered and can be identified by cross reference to the Flight Path numbers found in Column 1 **Table 19**, below. A discussion of the survey results is included in **Section 13**, below.

Table 14: Total Observation Time by Season Breeding Year 1 (Y1)

VP Number	Total (seconds)
VP1	106
VP2	0
VP3	0
Total	106

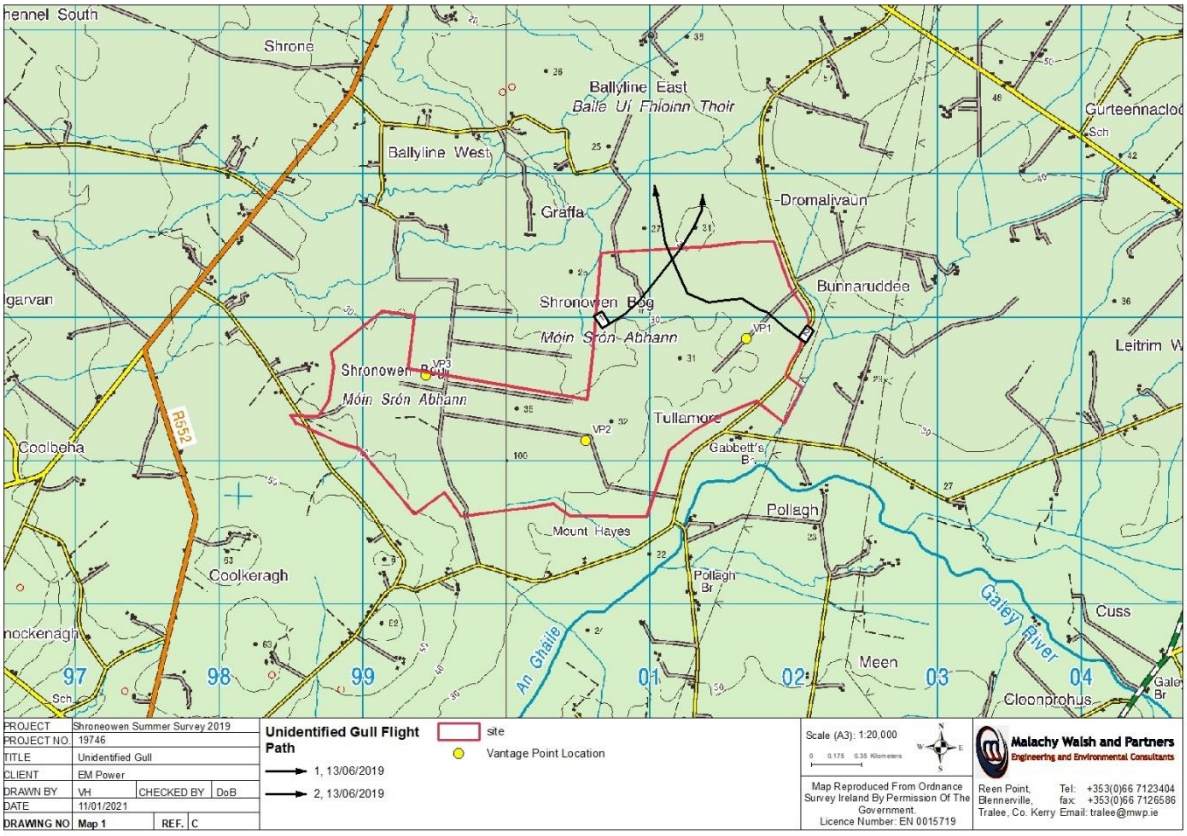


Figure 14: Unidentified gull flight paths Map 1

12.3.5.1 VP1 (June 13th) Flight Path 1

At 16:09 an unidentified gull was observed flying through the site. This gull was observed flying over bog habitat to the west of VP1 flying in a north easterly direction. This gull flew from within the site boundary to outside the site boundary.

12.3.5.2 VP1 (June 13th) Flight Path 2

At 16:10, three unidentified adult gulls were observed flying through the site. These were observed to the south west of VP1 flying in a west and then northerly direction over bog habitat. This gull flew into the site and then outside the site boundary.

Table 15: Summary characteristics of mallard flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	11/04/19	2	12:25	2 Female/ Adult	12	Flying	0-20m	Bog
2	Map 1 Ref C	13/04/19	2	10:36	Pair/ Adult	10	Flying	0-20m	Bog
3	Map 1 Ref C	13/04/19	2	11:05	2 Female 1 Male/ Adult	120 60	Flying Flying	0-20m 20-50m	Bog Bog
4	Map 1 Ref C	19/05/19	2	10:34	Pair/ Adult	7 5	Flying Flying	0-20m 20-50m	Bog Bog

Table 16: Summary characteristics of buzzard flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	10/04/19	1	12.30	Male/unknown	120 60	Mobbing Mobbing	50-100m 100-150m	1st Rotation Forest and Heather Moorland

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
						240	Mobbing and Soaring	>150m	Heather Moorland Heather Moorland

Table 17: Summary characteristics of little egret flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	18/05/19	3	14:45	/	10 15	Flying Flying	0-20 20-50m	Bog and Scrub Bog, scrub and 1st rotation forestry
2	Map 1 Ref C	21/07/19	3	16:47	Unknown/ Adult	10	Flying	0-20m	Bog and scrub

Table 18: Summary characteristics of lesser black-backed gull flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	26/06/19	1	19:00	Unknown	50 120	Flying and soaring	20-50m 50-100m	Bog and 1st rotation forestry
2	Map 1 Ref C	26/06/19	3	17:40	Unknown	60	Soaring	50-100m	Grassland moorland and Bog

Table 19: Summary characteristics of unidentified gull flights observed

Flight Path No.	Drawing No.	Date	VP	Time of Observation	Gender/age	Duration of observation (in seconds)	Behaviour	Height Flown (m)	Habitat(s) overflown
Breeding - 2019									
1	Map 1 Ref C	13/06/19	1	16:09	Unknown/ Adult	34	Flying	20-50m	Bog
2	Map 1 Ref C	13/06/19	1	16:10	Unknown/ Adult	72	Flying	20-50m	Bog

13 DISCUSSION

Two Primary Target species and one Secondary Target species was recorded during the survey period. These are, as follows:

- Primary Target Species:
  - Hen harrier (*C. cyaneus*)
  - Kestrel (*F. tinnunculus*)

- Secondary Target Species
  - Snipe (*G. gallinago*)

In addition, non target species namely, mallard (*A. platyrhynchos*), buzzard (*B. buteo*), little egret (*E. garzetta*), lesser black-backed gull (*L. fuscus*) and an unidentified gull were also recorded.

13.1 PRIMARY TARGET SPECIES

Hen harrier was recorded on four occasions during four of the six months of the breeding survey period 2019. During this survey period flight paths were recorded mostly around VP2. One observation was recorded from both VP3 and VP1. Two of these were of an adult male, one was of an adult female and the remaining bird was categorised as a juvenile female. They were observed flying, circling, hunting and perched over bog mainly but also over 1st rotation forestry, scrub and grassland moorland. Flight heights were recorded to be within 0-150m. Three of these observation were made within the site boundary and one male hen harrier was observed flying eastwardly from VP1 outside the site boundary (see **Figure 1**, above). Hen harrier flight activity was spread throughout the site. A male was observed in the centre of the site flying leisurely on the 9th of June and then another male was observed hunting outside of the site boundary south of VP1 on the 29th of September, possibly the same bird. On the 8th of April a female was observed was circling and flying north west of VP2 and then on June 9th a female juvenile was observed. This bird was of hovering and then the bird headed deliberately to a verge of conifer plantation and perched on a spruce tree. She then flew into the grassland moorland/bog a short distance from the perch. This occurred to the south west of VP2 and the bird then flew in an easterly and then south easterly direction. In general, the observations have been recorded around noon between the hours of 11:53 and 14:06.

In general, the areas overflown in both wintering 2018/19 and breeding 2019 surveys are broadly similar and no significant variation is apparent. Also, the number of sightings was similar in winter (five, one was an ad hoc anecdotal recording) and in the breeding season (four). The breeding survey identified the same sex and age of birds as the winter survey; a male, female and juvenile. The male however, was observed flying within the site boundary during the breeding survey. Male, female and juvenile have been observed on the site therefore while there was no evidence of breeding in or close to the site, breeding may be occurring in the greater area.

Kestrel was recorded on 14 occasions during four of the six months of the survey period. During this survey period half of the flight paths were recorded from VP1. Most of the sightings were of birds hunting over bog mainly however, a variety of habitat types were utilised including grassland

moorland, 1st rotation forestry, scrub, improved grassland and a bog track. The kestrels were observed flying at various heights ranging from 0-50m over these habitats. The majority of the observations were made within the site boundary with most of the activity recorded in the north-east of the site. One pair was recorded on the 26th of June by VP1. The pair were observed on a small heap of drying turf to the north-east of VP1. They flew together towards the perch site to the north-west. Here they remained together while perched and flew off to the east together. This flight was observed at heights between 0-50m and occurred outside the site boundary.

The areas overflown in both wintering 2018/19 and breeding 2019 surveys are broadly similar, kestrel were recorded in the northeast and west southwest of the site during both years. There was an increase in the number of sightings between winter (eight) and in the breeding season (14).

Whooper swan were not observed during this breeding 2019 survey. On the 10th and 11th of April the site where whooper swan had previously been observed was surveyed. On these dates no whooper swans were observed and cattle were seen grazing in this improved grassland. It is considered, on the basis of the survey data, that whooper swan are winter visitors and are not using the site they were previously observed in (in winter 2018/19) over the breeding 2019 season.

13.2 SECONDARY TARGET SPECIES

Snipe were recorded on two occasions and during two of the six months of the survey period. During this survey period flight paths were recorded from VP2. The snipe were observed flying over bog and scrub. The flight paths observed were all on the eastern side of the site from VP2. Seven snipe were observed flying outside the site boundary and the other observation was of one inside the site boundary.

Similarly to the wintering 2018/19 season this species was recorded on two occasions and both were in the east of the site. It is considered, on the basis of the survey data, that snipe were not present to a significant extent during the survey period comprising wintering 2019/19 and breeding 2019.

13.3 OTHER SPECIES OBSERVED

Mallard was recorded on one occasion and during two of the six months of the survey period. During this survey period all flight paths were recorded from VP2. All flights observed were made in the east of the site all within the site boundary over bog. Both males and females were recorded together during this survey period. It is considered, on the basis of the survey data, that mallard flew over this eastern side of the site during the survey period comprising wintering 2019/19 and breeding 2019.

Buzzard was recorded on one occasion during April. During this survey period this male's flight path was recorded from VP1. This buzzard was observed for a substantial amount of time and flew across the site from the north east to the west over 1st rotation forest and heather moorland within the site boundary over bog. It is considered, on the basis of the survey data, that buzzard were not present to a significant extent during the survey period comprising wintering 2019/19 and breeding 2019.

Little egret was recorded on one occasion during two of the six months of the survey period. During this survey period flight paths were recorded from VP3. They were observed flying over bog, scrub and 1st rotation forestry in the west of the site, within the site boundary. It is considered, on the basis of

the survey data, that little egret were not present to a significant extent during the survey period comprising wintering 2019/19 and breeding 2019.

LBBG was recorded on one occasion during one of the six months of the survey period. During this survey period flight paths were recorded from VP1 and VP3. They were observed flying bog, 1st rotation forestry and grassland moorland in the north east and north west of the site, within and outside the site boundary. It is considered, on the basis of the survey data, that LBBG were not present to a significant extent during the survey period comprising wintering 2019/19 and breeding 2019.

An unidentified gull was recorded during one of the six months of the survey period. During this survey period flight paths were recorded from VP1. They were observed flying bog, in the north east of the site, within and outside the site boundary. It is considered, on the basis of the survey data that unidentified gulls were possibly lesser black-backed gulls given that they were observed flying over similar sections of the site.

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Appendix 1

NPWS Recommended Methodology for Assessment of Impacts Proposed by Wind farms

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 windfarms (collision and displacement), the possibility of indirect habitat loss, or displacement, if birds avoid a windfarm 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 windfarms that have planning permission at present is small. Other proposed windfarms, 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 windfarms 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 windfarm 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 1

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

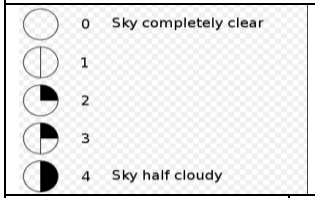
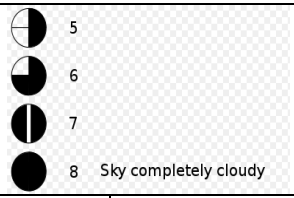
H/B
Heath / Bog
DE
Deciduous woodland & scrub

GO, Gorse

Appendix 2

Survey Field Sheets

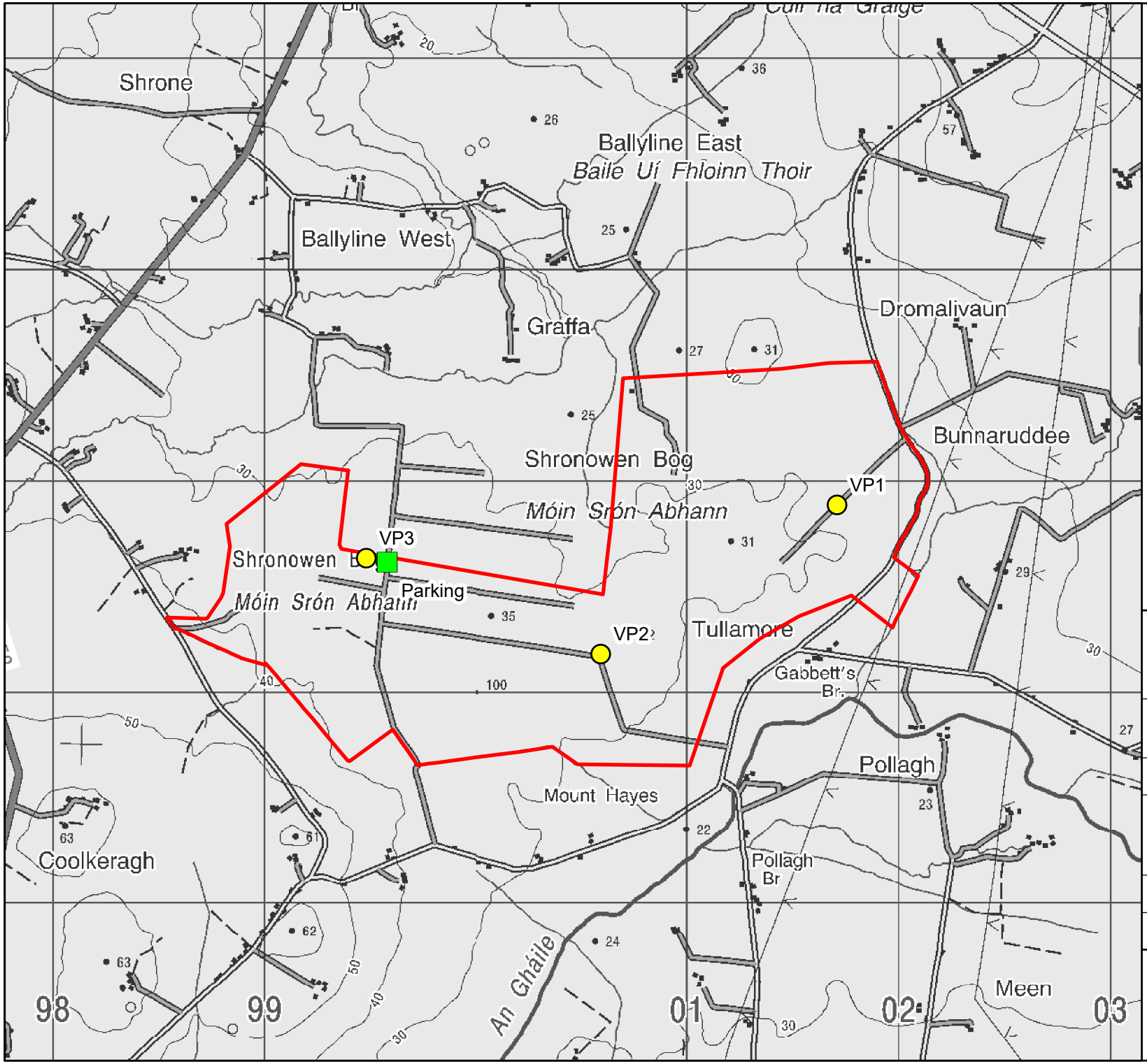
See over for additional notes

Location: Shroneowen WF	Project No: 19746	VP No:	Observer	Date:		Visibility:
				Time:	Start:	
					Finish:	
		Weather		Wind Speed & Direction:		Temp:

Barn Owl		Goldfinch		Long-eared Owl		Sand Martin		Whooper Swan	
Blackbird		Grasshopper Warbler		Long-tailed Tit		Sedge Warbler		Wigeon	
Blackcap		Grt Black-backed Gull		Magpie		Shelduck		Willow Warbler	
Black-headed Gull		Great Tit		Mallard		Siskin		Woodcock	
Blue Tit		Greenfinch		Meadow Pipit		Skylark		Woodpigeon	
Brambling		Grey Heron		Merlin		Snipe		Wren	
Bullfinch		Grey Partridge		Mistle Thrush		Song Thrush		Yellowhammer	
Buzzard		Grey Wagtail		Moorhen		Sparrowhawk		**Additional Species**	
Chaffinch		Greylag Goose		Mute Swan		Sptd Flycatcher			
Chiffchaff		Hen Harrier		Peregrine		Starling			
Coal Tit		Herring Gull		Pheasant		Stock Dove			
Collared Dove		Hooded Crow		Pied Wagtail		Stonechat			
Coot		House Martin		Raven		Swallow			
Crossbill		House Sparrow		Red Grouse		Swift			
Cuckoo		Jackdaw		Redpoll		Teal			
Curlew		Jay		Redshank		Tree Sparrow			
Dunlin		Kestrel		Redwing		Treecreeper			
Dunnock		Lapwing		Reed Bunting		Water Rail			
Fieldfare		Lsr-blk-bk Gull		Ringed Plover		Wheatear			
Goldcrest		Linnet		Robin		White-fronted Goose			
Golden Plover		Little Grebe		Rook		Whitethroat			

TARGET SPECIES FIELD SHEET									
Project No: **19746**	VP:	Date:	Survey Sheet No:	Surveyor:				Species:	
Location: **Shroneowen**									
VP Start:			Wind Speed (B 'fort)	Wind Direction:		Visibility:			
VP Finish:									
Weather Conditions:									
Disturbance:									
Time first observed:	**Activity Codes: (H)** Hunting, **(F)** Flying, **(S)** Soaring, **(C)** Circling, **(P)** Perched, **(G)** On Ground, **(M)** Mobbing, **(D)** Display. **Habitat Codes**: **(IG)** Improved Grassland, **(RG**) Rough Grassland, **(G)** Grassland Moorland, **(S)** Scrub, **(B)** Bog, **(1F)** 1st Rotation Forest, **(2F)** 2nd Rotation Forest, **(T)** Thicket/Pole Stage Forest, **(CF)** Clear Fell, **(H)** Heather Moorland, **(L)** Lake, **(P)** Pond, **(TSW)** Temporary Standing Water, **(O)** Other (specify):								
Sex:									
Age:									
0m – 20m (Seconds)	Activity/Habitat	20-50m	Activity/Habitat	50-100m	Activity/Habitat	100-150m	Activity/Habitat	>150m	Activity/Habitat

Notes:



Legend

- Vantage Point Location
- Parking Location
- Boundary

0 0.475 0.95 km

N

Project Title:
Shronowen Wind Farm

Client: Shronowen Wind Farm Limited

Drawing Title:
Vantage Point Locations

Drawn: JK	Checked: DoB
Date: 19/11/2020	Scale (A4): 1:25,000

Malachy Walsh and Partners
Engineering and Environmental Consultants

Appendix 3

Vantage Point Survey Summary

Vantage Point Survey Summary

Location: Shronowen

April 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	10/04/2019	PR	14.00	17.00	3	Cloud cover 5/8, temp 14oc, wind f0, wind direction NA, visibility 2.5km
1	10/04/2019	GH	09.45	12.45	3	Cloud cover 7/8, temp 10oC, haze, wind direction 3 (easterly), visibility 2.5km, wind calm.
2	13/04/2019	CMc	09.00	12.00	3	Cloud cover 8/8, temp 8oC, wind direction 4.5, wind speed f3, visibility 2.0km.
2	11/04/2019	CMc	09.35	12.35	3	Cloud cover 5/8, wind f2 gusts of f3, wind direction south westerly, visibility 2.0km.
3	08/04/2019	CMc	11.00	14.00	3	Cloud cover 6/8, temp 10oC, wind direction 3, wind f2, visibility 2.0km and no rain.
3	10/04/2019	GH	13.00	16.00	3	Cloud cover 8/8, temp 14oc, wind light, wind direction 1.5, visibility 2.5km.

May 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	25/05/2019	CMc	15.30	18.30	3	Cloud cover 7/8, temp 13oc, no rain, southwest wind f2, temp 13oC, visibility 2.5.
1	15/05/2019	GH	09.00	12.00	3	Cloud cover 4/8, temp 16oC, visibility 2.5, wind speed moderate, southeast wind.
2	19/05/2019	CMc	09.00	12.00	3	Cloud cover 4/8, temp 11oC, no rain, northwest wind f2, visibility 2.5.
2	15/05/2019	GH	12.30	15.30	3	Cloud cover 4/8, temp 17oc, moderate wind southeast, no rain, 2.5. visibility.
3	19/05/2019	CMc	12.30	15.30	3	Cloud cover 4/8, temp 11oC, no rain, northwest wind f2, visibility 2.5.

Vantage Point Survey Summary

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
3	18/05/2019	CMc	13.30	16.30	3	Cloud cover 8/8, temp 10oc, northwest wind f2, no rain, visibility 2.5.

June 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	26/06/2019	GH	18.30	21.30	3	Cloud cover 7/8, temp 21oc, moderate wind.
1	16/06/2019	PR	15.00	18.15	3	Cloud cover 7/8, temp 9oC, visibility 2.5km, wind speed f4-5, northeast wind and intermittent drizzle.
2	09/06/2019	PR	12.15	15.20	3	Cloud cover 4/8 until 1.30 and 2/8 after 1.30, temp 17oC, northwest wind f0-1, visibility 2.5km.
2	23/06/2019	GH	10.30	13.30	3	Cloud cover 8/8, temp 15oc, moderate rain continuous, wind f3, 4.5, visibility 1.5km.
3	26/06/2019	GH	15.00	18.00	3	Cloud cover 6/8, temp 21oC, wind speed moderate, easterly wind f3, visibility 2.5km.
3	29/06/2019	CMc	11.30	14.30	3	Cloud cover 4/8, temp 17oc, wind f1-2, wind 7.5, no rain, visibility 2.5km.

July 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	09/07/2019	GH	13.00	16.00	3	Cloud cover 6/8, temp 21oc, moderate light wind, 9 west.
1	24/07/2019	CMc	15.30	18.30	3	Cloud cover 8/8, temp 19oC, no rain, wind direction 6, visibility 2.5km, wind speed f2.
2	09/07/2019	GH	09.30	12.30	3	Cloud cover 6/8, temp 17oC, west wind 9, light wind, visibility 2.5km.
2	21/07/2019	CMc	10.30	13.30	3	Cloud cover 7/8, heavy rain intermittent, wind f2-3, wind direction 6,

Vantage Point Survey Summary

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
						visibility 2.5km.
3	21/07/2019	CMc	07.00	10.00	3	Cloud cover 6/8, temp 15oC, wind direction 6, wind f1, visibility 2.5km.
3	21/07/2019	CMc	15.30	18.30	3	Cloud cover 8/8, temp 15oc, wind f2-3, wind 7.5, heavy rain intermittent, visibility 1.0km.

August 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	28/08/2019	CMc	10.30	13.30	3	Cloud cover 4/8, temp 14oc, wind f2, wind direction 7.5, visibility 2.5km and no rain.
1	28/08/2019	CMc	14.30	17.30	3	Cloud cover 6/8, temp 15oC, slight rain intermittent, wind direction 9, visibility 2.5km, wind speed f2.
2	17/08/2019	CMc	12.00	15.00	3	Cloud cover 4/8, temp 16oC, wind direction 7.5, wind speed f3, visibility 2.5km and no rain.
2	25/08/2019	CMc	11.00	14.00	3	Cloud cover 7/8, wind f2, wind direction 10.5, visibility 2.5km.
3	17/08/2019	CMc	15.15	18.15	3	Cloud cover 5/8, temp 16oC, wind direction 7.5, wind f3, visibility 2.5km.
3	23/08/2019	CMc	09.00	12.00	3	Cloud cover 4/8, temp 18oc, wind f2, wind direction 7.5, no rain, visibility 2.5km.

September 2019 VP 1-3

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
1	28/09/2019	CMc	08.30	11.30	3	Cloud cover 8/8, temp 14oC, wind direction 7.5, visibility 1.5km, moderate rain intermittent, wind speed f2.
1	28/09/2019	CMc	13.30	16.30	3	Cloud cover 5/8, temp 14oc, wind f2, wind direction 10.5, visibility 2.5km

Vantage Point Survey Summary

VP	Date	Observer	Start Time	Finish Time	Length of VP watch (hours)	Weather
2	16/09/2019	CMc	13.00	16.00	3	Cloud cover 7/8, temp 16oC, wind direction 12, wind speed f1, no rain, visibility 2.5km.
2	21/09/2019	CMc	09.30	12.30	3	Cloud cover 7/8, temperature 15oC, wind f3, wind direction 4.5, visibility 2km.
3	14/09/2019	CMc	11.00	14.00	3	Cloud cover 4/8, temp NA, wind f1-2, wind direction 7.5, no rain, visibility 2.5km.
3	15/04/2019	CMc	12.00	15.00	3	Cloud cover 8/8, temperature 16oC, wind direction 9, wind f2-3, visibility 1.5km.

Appendix 4

Target/Secondary Species Observations

Hen harrier														
Date	VP	Sex	Age	Map Flight Path No.	Habitat	No. Of Birds	Time of Flight/ Obs.	Activity	Flight Height (m)	Time (sec) in Height Category				
										Non-flight	0-50m	50 – 100m	>100m	>200m
08/04/19	3	Female	Adult	1	Bog and Scrub Bog Bog	1	11.53 12.15 12.37	Flying Circling Circling	0-20m 100-150 100-150m		10		60 60	
09/06/19	2	Male	Adult	2	Bog	1	14.00	Flying	0-20m		32			
09/07/19	2	Female	Juvenile	3	1st rotation forestry Bog 1st rotation forestry and grassland moorland	1	12.22	Perched Flying Hunting	0-20m 0-50m 50-100m		40 30		150	
29/09/19	1	Male	Adult	4	Bog and Scrub	1	14.06	Hunting	0-20m		30			

Kestrel														
Date	VP	Sex	Age	Map Flight Path No.	Habitat	No. Of Birds	Time of Flight/ Obs.	Activity	Flight Height (m)	Time (sec) in Height Category				
										Non-flight	0-50m	50 – 100m	>100m	>200m
09/06/19	2	Unknown	Adult	1	Bog	1	15.14	Flying, soaring, circling and hunting	20-50m		50			
13/06/19	1	Unknown	Unknown/ Adult	2	Heavily grazed bog track Bog	1	15.29	Hunting Perched Flying	0-20m 0-20m		23 11			

					Bog				0-20m		13			
26/06/19	1	Pair	Unknown	3	Bog Bog and grassland moorland	2	20.30	Perched Flying	0-20m 20-50m		100 80			
21/07/19	3	Unknown	Unknown	4	Bog and scrub	1	08.00	Flying and hunting	0-20m		180			
21/07/19	3	Male	Adult	5	Bog	1	09.23	Hunting	0-20m		40			
23/08/19	3	Unknown	Unknown	6	1st rotation forestry Improved grassland and 1st rotation forestry	1	10.04	Flying Hunting and mobbed	0-20m 20-50m		5 125			
28/08/19	1	Unknown	Unknown	7	Bog	1	12.16	Flying and hunting	20-50m		120			
28/08/19	1	Unknown	Unknown	8	Bog	1	12.18	Flying and hunting	20-50m		120			
28/08/19	1	Female	Adult	9	Bog Bog	1	13.00	Flying Flying	0-20m 20-50m		10 30			
28/08/19	1	Male	Adult	10	Bog	1	13.05	Hunting	0-20m		30			
14/09/19	3	Male	Adult	11	Bog and scrub Bog, scrub and 1st rotation forestry	1	13.42	Hunting Flying and hunting	0-20m 20-50m		20 120			
16/09/19	2	Unknown	Adult	12	Bog and scrub Bog and scrub	1	14.25	Mobbed Hunting and mobbed	0-20m 20-50m		5 30			
28/09/19	1	Unknown	Unknown	13	Bog and scrub	1	11.10	Mobbed	0-20m		15			

29/09/19	1	Female	Adult	14	Bog	1	14.08	Hunting	20-50m		40			

Snipe														
Date	**VP**	**Sex**	**Age**	**Map Flight Path No.**	**Habitat**	**No. Of Birds**	**Time of Flight/ Obs.**	**Activity**	**Flight Height (m)**	**Time (sec) in Height Category**				
										Non-flight	**0-50m**	**50 – 100m**	**>100m**	**>200m**
13/04/19	2	Unknown	Adult	1	Bog	7	10.17	Flying	0- 20m		10			
16/09/19	2	Unknown	Unknown	2	Bog and scrub	1	14.43	Flying	20-50m		20			

Mallard														
Date	**VP**	**Sex**	**Age**	**Map Flight Path No.**	**Habitat**	**No. Of Birds**	**Time of Flight/ Obs.**	**Activity**	**Flight Height (m)**	**Time (sec) in Height Category**				
										Non-flight	**0-50m**	**50 – 100m**	**>100m**	**>200m**
11/04/19	2	Female	2 Female/ Adult	1	Bog	2	12:.25	Flying	0-20m	12				
13/04/19	2	Female & Male	Adult	2	Bog	2	10.36	Flying	0-20m	10				
13/04/19	2	2 Female 1 Male	Adult	3	Bog Bog	3	11.05	Flying Flying	0-20m 20-50m	120 60				
19/05/19	2	Female & Male	Adult	4	Bog Bog	2	10.34	Flying Flying	0-20m 20-50m	7 5				

Buzzard														
Date	**VP**	**Sex**	**Age**	**Map Flight Path No.**	**Habitat**	**No. Of Birds**	**Time of Flight/ Obs.**	**Activity**	**Flight Height (m)**	**Time (sec) in Height Category**				
										Non-flight	**0-50m**	**50 – 100m**	**>100m**	**>200m**
10/04/19	1	Male	Unknown	1	1st Rotation Forest and Heather Moorland	1	12.30	Mobbing Mobbing	0-20m		120 60			

					Heather Moorland Heather Moorland			Mobbing and Soaring			240			

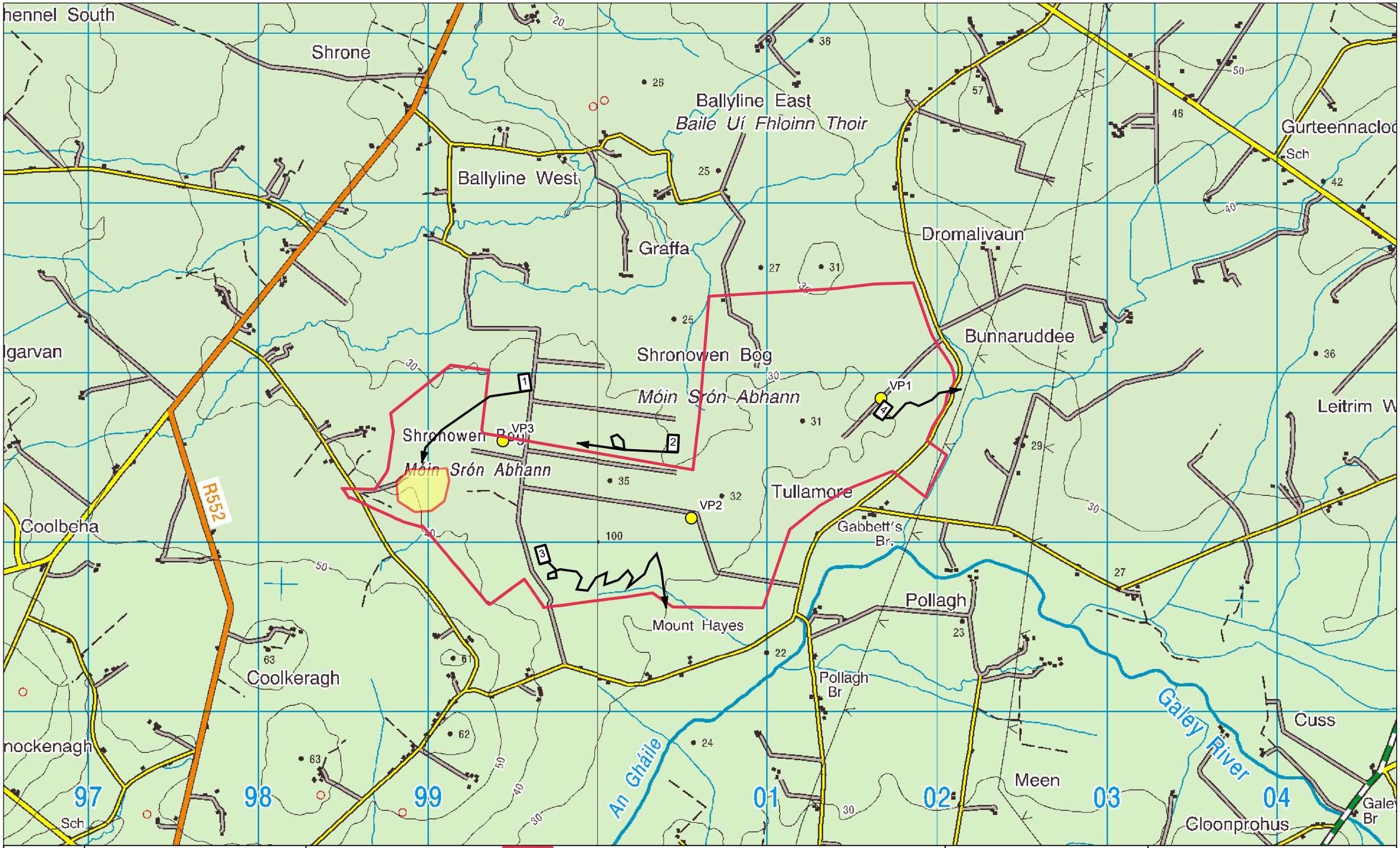
Little egret														
Date	**VP**	**Sex**	**Age**	**Map Flight Path No.**	**Habitat**	**No. Of Birds**	**Time of Flight/ Obs.**	**Activity**	**Flight Height (m)**	**Time (sec) in Height Category**				
										Non-flight	**0-50m**	**50 – 100m**	**>100m**	**>200m**
18/05/19	3	Unknown	Unknown	1	Bog and Scrub Bog, scrub and 1st rotation forestry	1	14.45	Flying Flying	0-20 20-50m		10 15			
21/07/19	3	Unknown	Adult	2	Bog and scrub	1	16.47	Flying	0-20m		10			

Lesser black-backed gull														
Date	**VP**	**Sex**	**Age**	**Map Flight Path No.**	**Habitat**	**No. Of Birds**	**Time of Flight/ Obs.**	**Activity**	**Flight Height (m)**	**Time (sec) in Height Category**				
										Non-flight	**0-50m**	**50 – 100m**	**>100m**	**>200m**
26/06/19	1	Unknown	Unknown	1	Bog and 1st rotation forestry	1	19.00	Flying and soaring	20-50m 50-100m		50 120			
26/06/19	3	Unknown	Unknown	2	Grassland moorland and Bog	1	17.40	Soaring	50-100m		60			

Unidentified gull														
Date	VP	Sex	Age	Map Flight Path No.	Habitat	No. Of Birds	Time of Flight/ Obs.	Activity	Flight Height (m)	Time (sec) in Height Category				
										Non-flight	0-50m	50 – 100m	>100m	>200m
13/06/19	1	Unknown	Adult	1	Bog	1	16.09	Flying	20-50m		34			
13/06/19	1	Unknown	Adult	2	Bog	1	16.10	Flying	20-50m		72			

Appendix 5

Flight Paths and Activity Areas



PROJECT	ShroneowenSummer Survey 2019		
PROJECT NO.	19746		
TITLE	Hen Harrier		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Hen Harrier Flight Path

- 1, 08/04/2019
- 2, 09/06/2019
- 3, 09/07/2019
- 4, 29/09/2019

- site
- Hen Harrier Activity
- Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

N W E S

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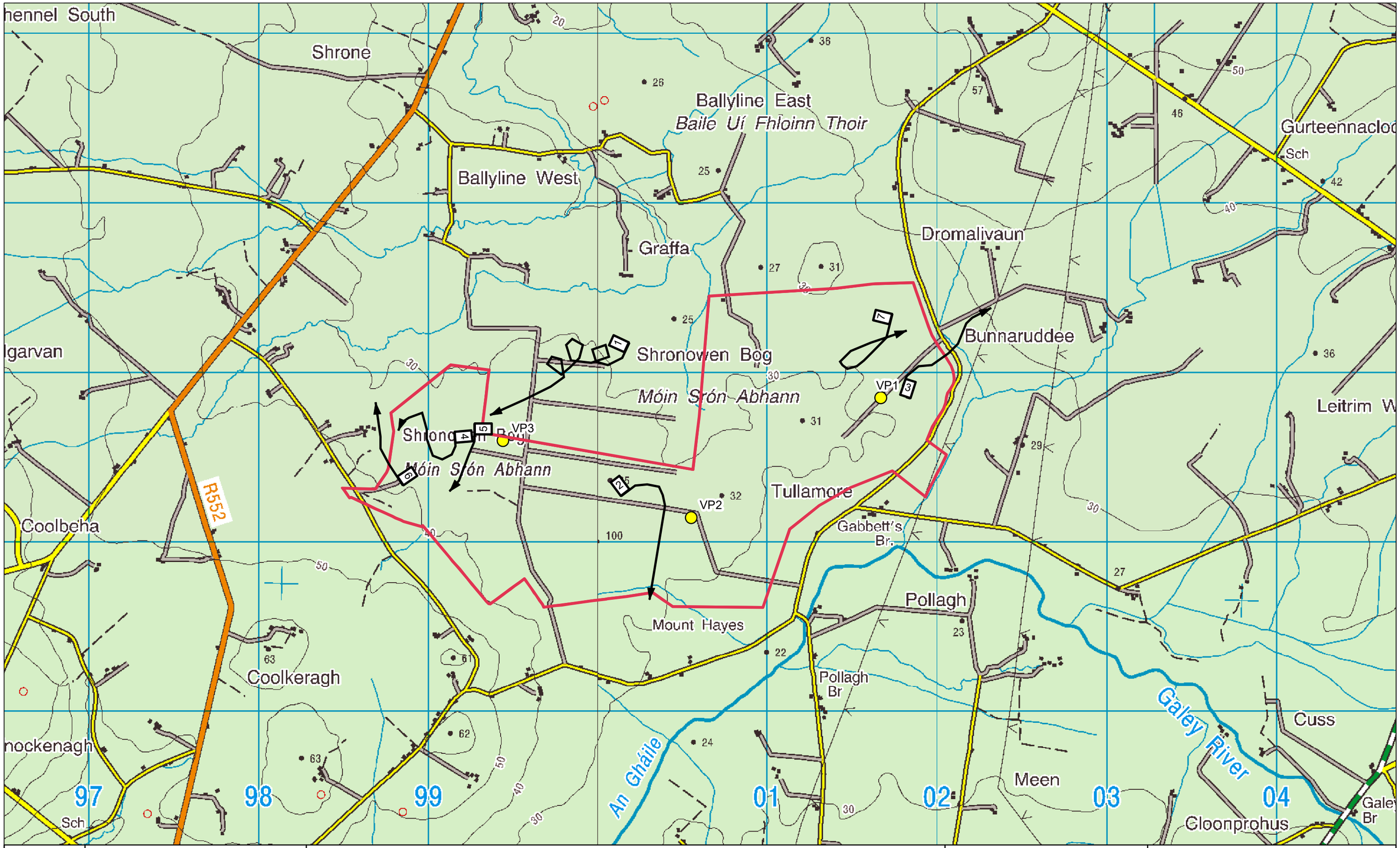

PROJECT	ShroneowenSummer Survey 2019		
PROJECT NO.	19746		
TITLE	Kestrel		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Kestrel Flight Path

- 1, 09/06/2019
- 2, 13/06/2019
- 3, 26/06/2019
- 4, 21/07/2019
- 5, 21/07/2019
- 6, 23/08/2019
- 7, 28/08/2019

site

Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

N W E S

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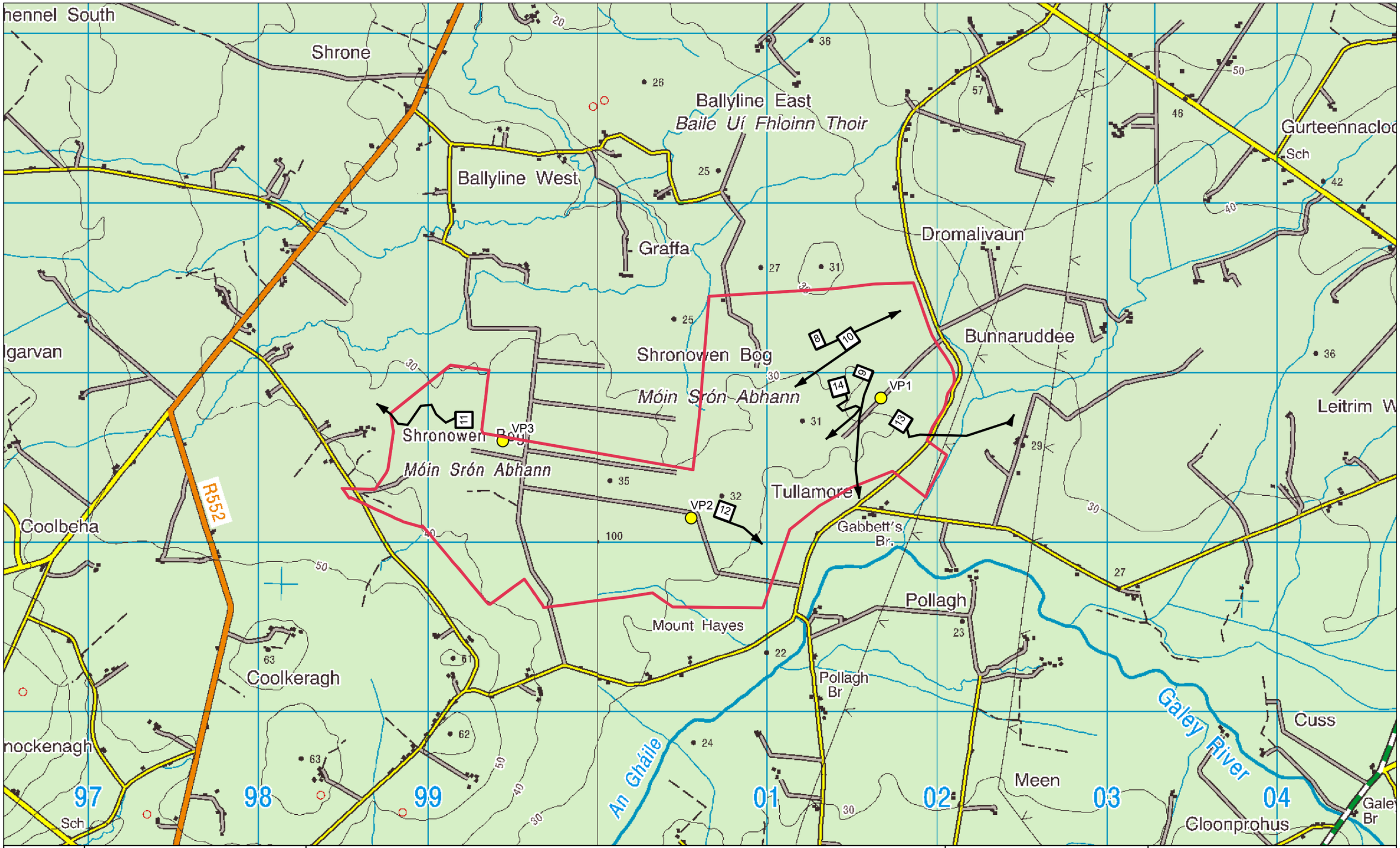

PROJECT	ShroneowenSummer Survey 2019		
PROJECT NO.	19746		
TITLE	Kestrel		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 2**	**REF.**	**C**

Kestrel Flight Path

- 8, 28/08/2019
- 9, 28/08/2019
- 10, 28/08/2019
- 11, 14/09/2019
- 12, 16/09/2019
- 13, 28/09/2019
- 14, 29/09/2019

site

Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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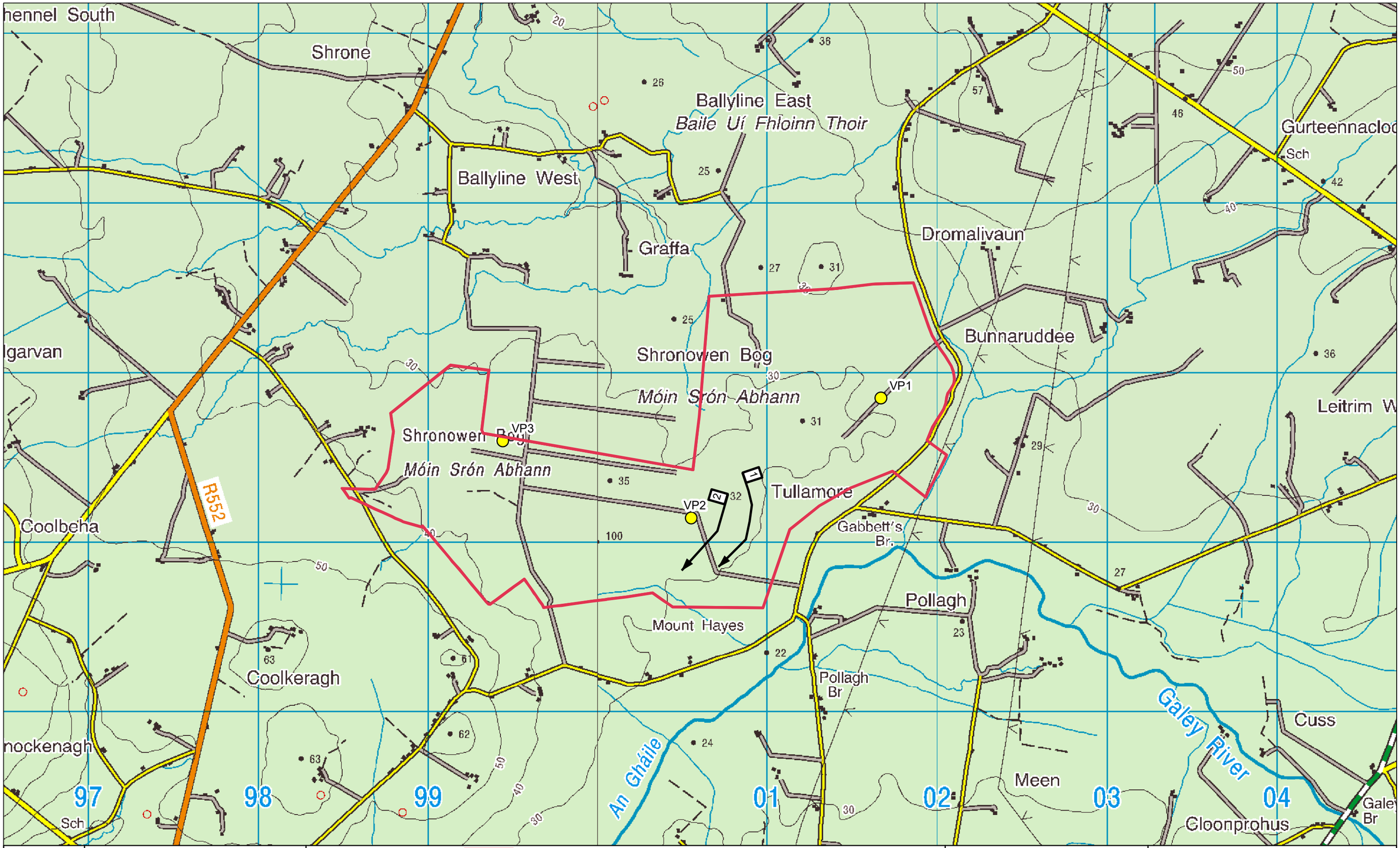

PROJECT	Shroneowen Summer Survey 2019		
PROJECT NO.	19746		
TITLE	Snipe		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Snipe Flight Path

site

1, 13/04/2019

2, 16/09/2019

Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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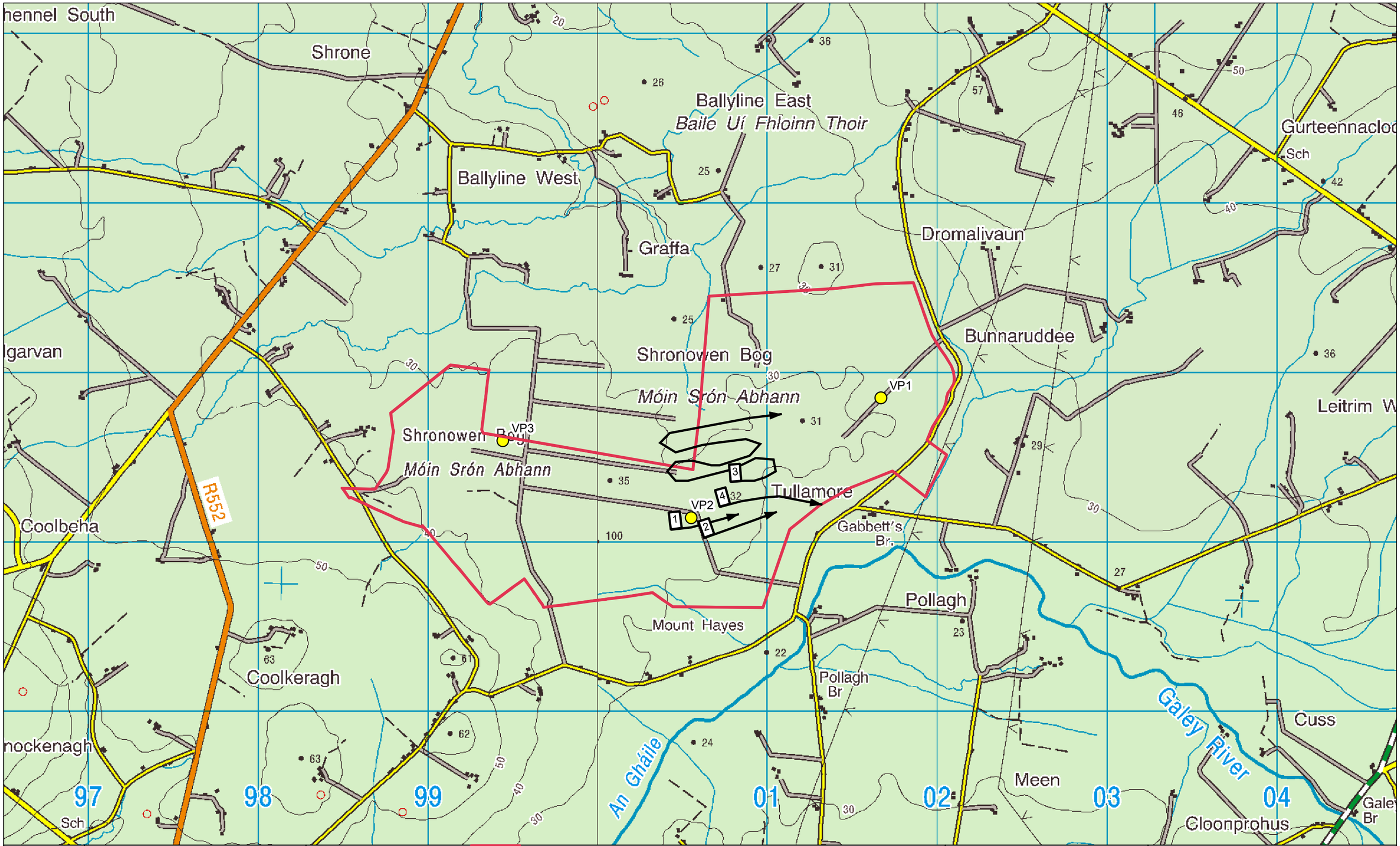

PROJECT	Shroneowen Summer Survey 2019		
PROJECT NO.	19746		
TITLE	Mallard		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Mallard Flight Path

- 1, 11/04/2019
- 2, 13/04/2019
- 3, 13/04/2019
- 4, 19/05/2019

site

Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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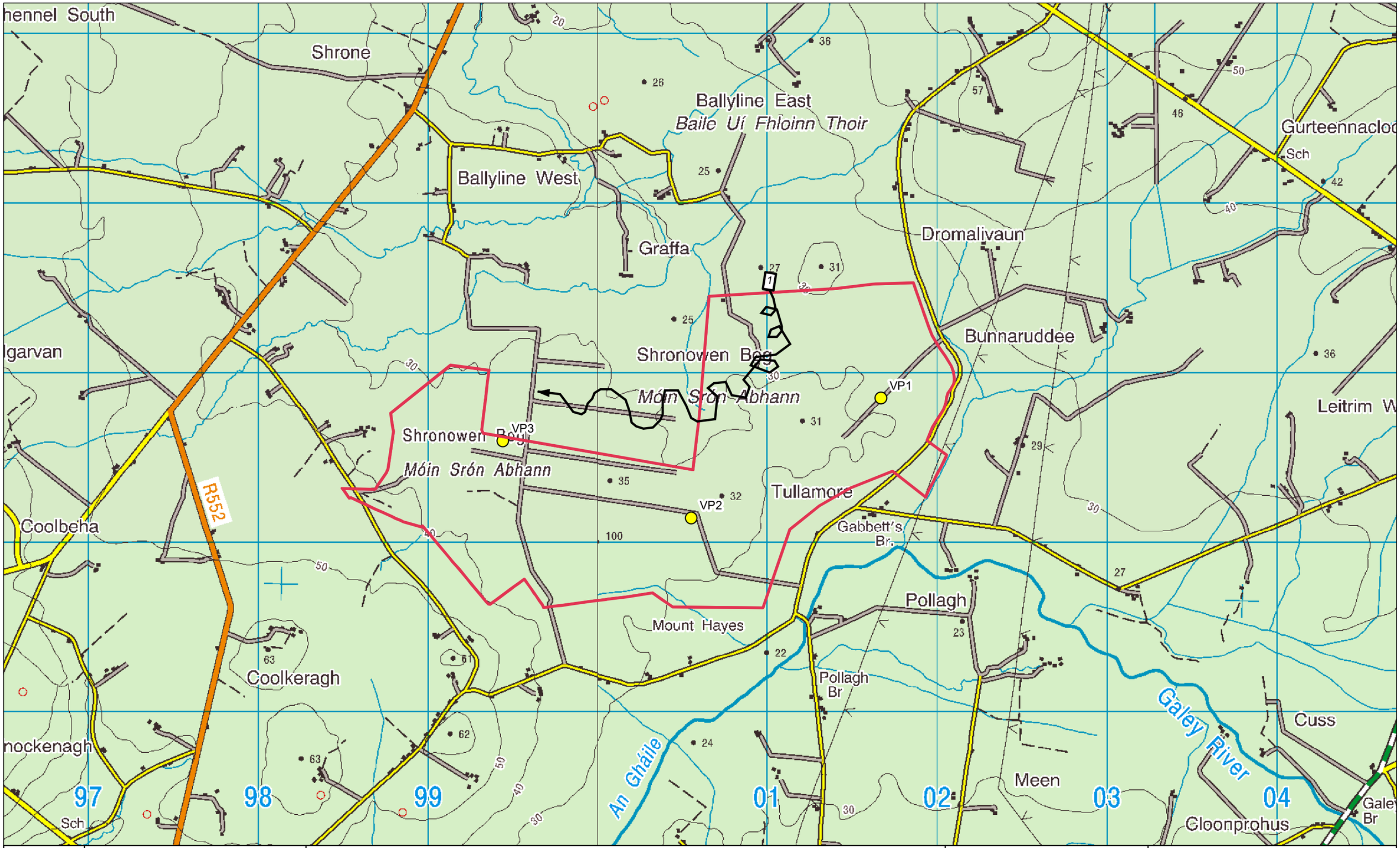

PROJECT	ShroneowenSummer Survey 2019			
PROJECT NO.	19746			
TITLE	Buzzard			
CLIENT	EM Power			
DRAWN BY	VH	CHECKED BY	DoB	
DATE	11/01/2021			
DRAWING NO	**Map 1**	**REF.**	**C**	

Buzzard Flight Path site

1, 10/04/2019 Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

N W E S

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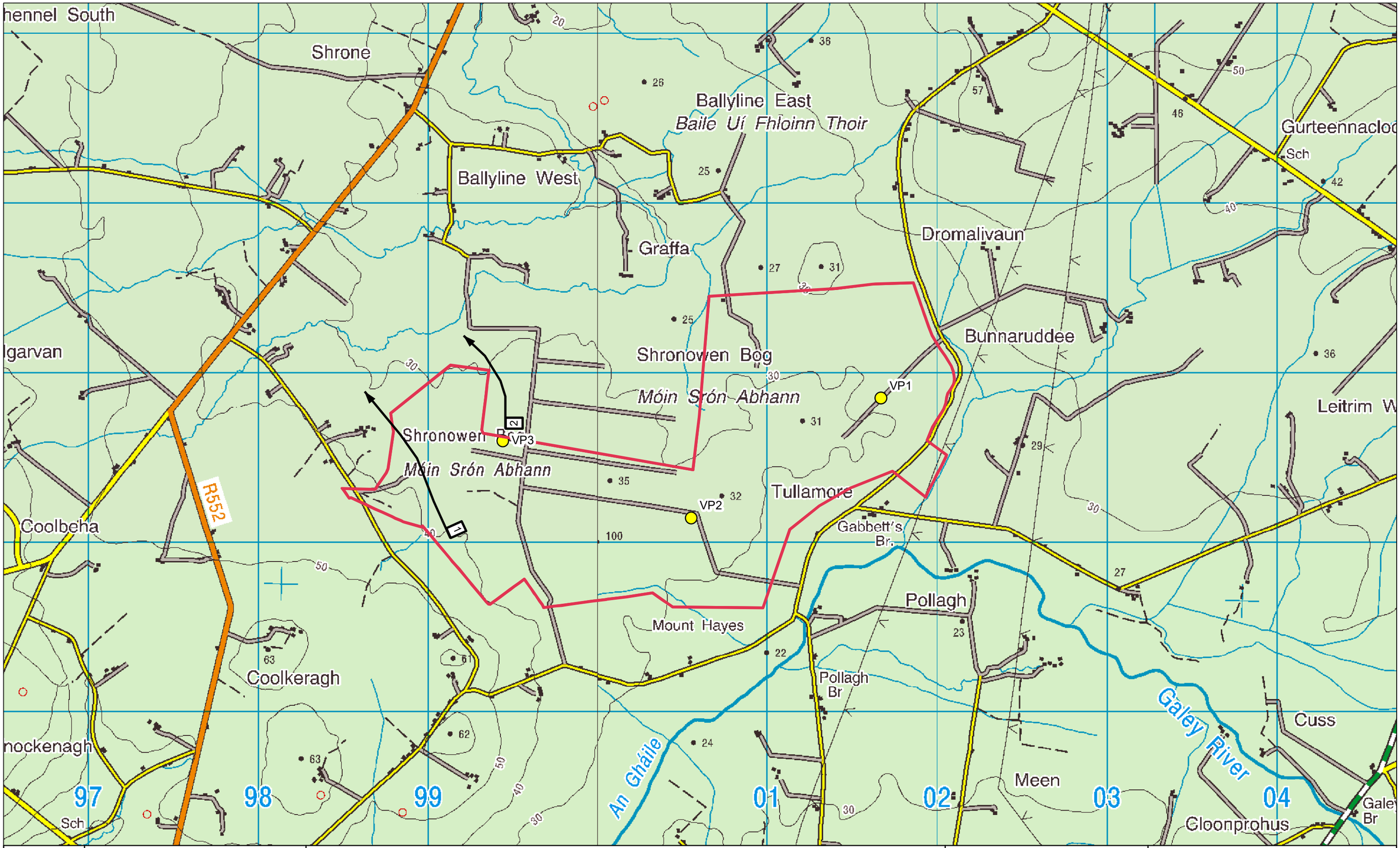

PROJECT	Shroneowen Summer Survey 2019		
PROJECT NO.	19746		
TITLE	Little Egret		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Little Egret Flight Path

site

1, 18/05/2019

2, 21/07/2019

Vantage Point Location

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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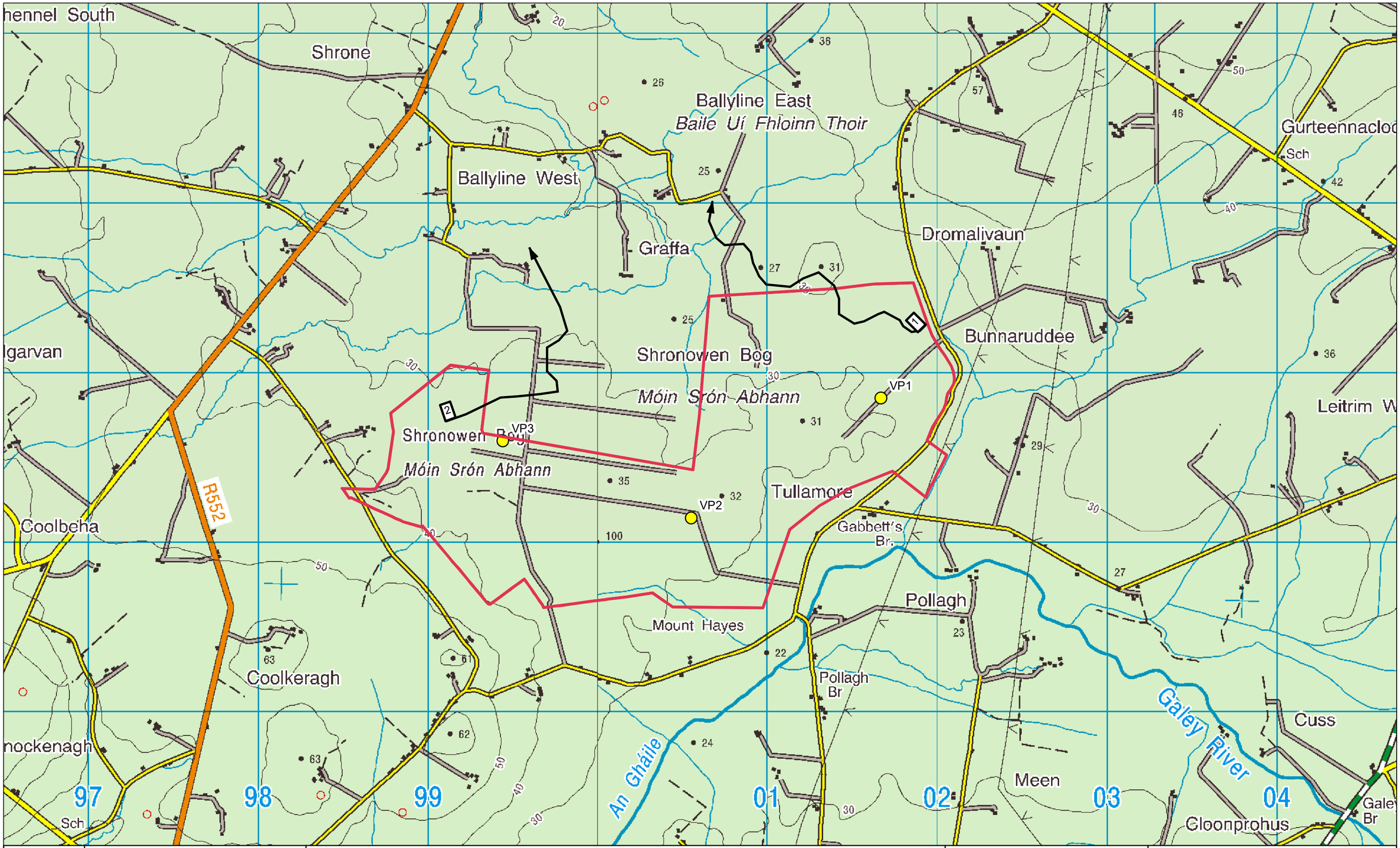

PROJECT	Shroneowen Summer Survey 2019		
PROJECT NO.	19746		
TITLE	Lesser Black Backed Gull		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Lesser Black Backed Gull Flight Path

site

Vantage Point Location

1, 26/06/2019

2, 26/06/2019

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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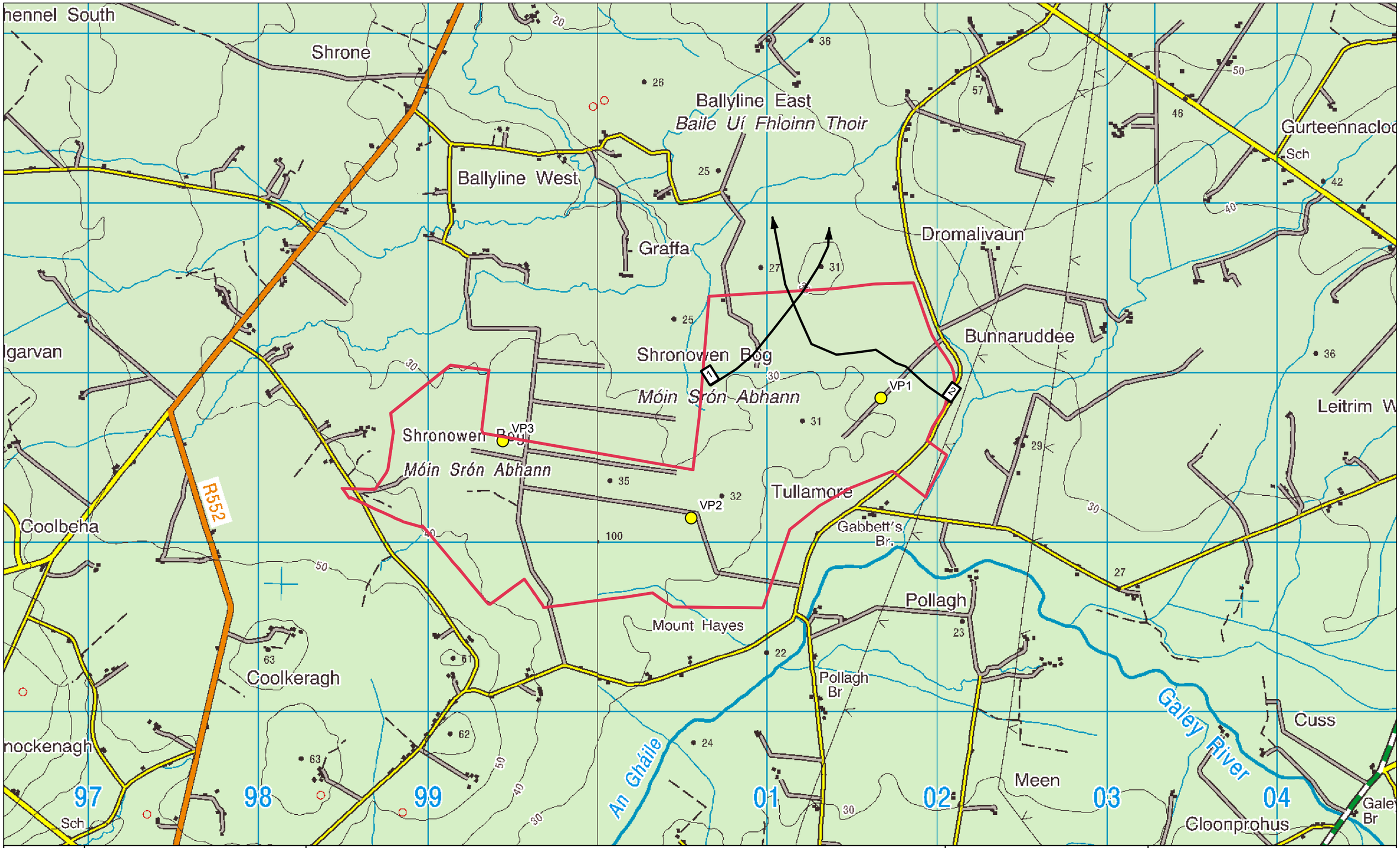

PROJECT	Shroneowen Summer Survey 2019		
PROJECT NO.	19746		
TITLE	Unidentified Gull		
CLIENT	EM Power		
DRAWN BY	VH	CHECKED BY	DoB
DATE	11/01/2021		
DRAWING NO	**Map 1**	**REF.**	**C**

Unidentified Gull Flight Path

- site
- Vantage Point Location
- 1, 13/06/2019
- 2, 13/06/2019

Scale (A3): 1:20,000

0 0.175 0.35 Kilometers

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Appendix 6

Non-Target Species of Conservation Concern recorded during VP Surveys

The following summary outlines all non-target species of conservation concern recorded during the breeding 2019 VP surveys.

Swallow *(Hirundo rustica)* was the most frequently recorded amber listed species. It was recorded in all months of the breeding survey, during April – September.

Meadow pipit *(Anthus pratensis)* and dunlin (*Calidris alpina*) were the only non-target red-listed species which were recorded. Dunlin was recorded once during the survey during August and meadow pipit were recorded in all months of the breeding survey. Amber-listed species which were frequently recorded include skylark (*Alauda arvensis*) recorded in four months during April -July. The other amber-listed species recorded were greenfinch *(Carduelis chloris),* linnet *(Carduelis cannabina),* robin (*Erithacus rubecula*) and stonechat (*Saxicola torquatus*).

27 green-listed species were recorded during the summer vantage point surveys. The majority of these species are common and widespread and occur in a wide variety of habitat-types, many of which are found within the survey area. Most of these species are present throughout the year while some are summer visitors to Ireland.

The following table outlines monthly peak counts for all non-target species of conservation concern recorded during vantage point surveys at Shronowen breeding 2019.

Common Name	Scientific Name	April	May	June	July	Aug	Sept
Dunlin	*Calidris alpina*					2	
Greenfinch	*Carduelis chloris*			1			
Linnet	*Carduelis cannabina*	1	2				
Meadow pipit	*Anthus pratensis*	5	4	20	7	2	9
Robin	*Erithacus rubecula*	1	1		1		1
Skylark	*Alauda arvensis*	20	4	20	3		
Stonechat	*Saxicola torquatus*	2	2	3		3	2
Swallow	*Hirundo rustica*	42	6	8	4	6	10

Appendix 7

List of All Species Recorded

The following table outlines peak counts for all species recorded during the breeding 2019 surveys at Shronowen. A total of 39 species were recorded (Annex I species* are highlighted in bold).

Common Name	Scientific Name	April	May	June	July	Aug	Sept
Blackbird	*Turdus merula*	2	2	1	2	1	2
Buzzard	*Buteo buteo*	1					
Chaffinch	*Fringilla coelebs*		2	1			
Chiffchaff	*Phylloscopus collybita*		2				
Coal tit	*Periparus ater*	1					
Collard dove	*Streptopelia decaocto*	1					
Cuckoo	*Cuculus canorus*		1	3			
Dunlin	*Calidris alpina*					2	
Dunnock	*Prunella modularis*	2				1	
Goldfinch	*Carduelis carduelis*				1		3
Great tit	*Parus major*	1					
Greenfinch	*Carduelis chloris*			1			
Grey heron	*Ardea cinerea*	1		1	1		
Hen harrier*	*Circus cyaneus*	1		1	1		
Hooded crow	*Corvus cornix*	4	2	3	3	2	4
Jackdaw	*Corvus monedula*				2		5
Kestrel	*Falco tinnunculus*			2	2	4	1
Linnet	*Carduelis cannabina*	1	2				
Little egret	*Egretta garzetta*		1		1		
Lesser Black-backed gull	*Larus fuscus*			1			
Magpie	*Pica pica*			1			4
Mallard	*Anas platyrhynchos*	5	2	2			
Meadow pipit	*Anthus pratensis*	5	4	2	7	2	9
Pheasant	*Phasianus colchicus*	2	1	1		1	1
Pied wagtail	*Motacilla alba*	2	1				
Raven	*Corvus corax*	12				2	2
Redpoll	*Carduelis flammea cabaret*		2		2		
Reed bunting	*Emberzia shoenichus*	2	1		1	5	
Robin	*Erithacus rubecula*	1	1		1		1
Rook	*Corvus frugilegus*	5	3	7	5	4	5
Song thrush	*Turdus philomelos*		1	1			
Skylark	*Alauda arvensis*	2	4	2	3		
Snipe	*Gallinago galinago*	7		1			2
Stonechat	*Saxicola torquatus*	2	2	3		3	2
Swallow	*Hirundo rustica*	42	6	8	4	6	1
Willow Warbler	*Phylloscopus*	2		4	2		

Common Name	Scientific Name	April	May	June	July	Aug	Sept
	trochilus						
Woodpigeon	*Columba palumbus*		2	3	1		
Wren	*Troglodytes troglodytes*	2	2	1	1	1	2
Unidentified gull				4			