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*Land at Altcar Moss*

# Wintering Bird Survey Report

Compiled by Ecology Services Ltd.

*on behalf of*

Aurora Energy Resources Limited

**August 2019 (rev. October 2019)**



Ref. number: 18171  
Written by: LR  
Checked: SB  
Approved: SB

1 Church Row Chambers  
Longton  
Preston  
Lancashire  
PR4 5PN

tel: 01772 614932  
fax: 01772 614930  
email: [info@ecologyservices.co.uk](mailto:info@ecologyservices.co.uk)  
web: [www.ecologyservices.co.uk](http://www.ecologyservices.co.uk)

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## 1.0 Introduction

- 1.1 Ecology Services Limited was commissioned by Aurora Energy Resources Ltd. in September 2018 to carry out wintering bird surveys of land north-west of Sutton's Lane, Great Altcar, Lancashire, hereinafter referred to as 'the site'. The centre of the site is located by National Grid Reference (NGR) 332670, 407523. See Figures 1 – 3: Wintering Birds Survey Maps.

### ***Site description***

- 1.2 The site is situated immediately to the east of the town of Formby and north of Great Altcar. The site comprises a small, broadly square, area of arable land in the north-east with a narrow strip of land linking to the B5195 in the south-west which includes part of Sutton's Lane and arable land intersecting ditches at two points. Land adjacent to the site is dominated by arable farmland which was being used for growing cereal crops at the time of the surveys. The field boundaries comprise a network of wide drainage channels and smaller ditches. The southern end of the application site adjoins Suttons Lane which, to the south of this point, is bordered by a hedgerow and scattered scrub. Farm buildings are located off the B5195 to the immediate south-west and south-east of the application site. To the west is a complex of farm buildings surrounded by scattered trees and a small area of woodland.

### ***Context and proposals***

- 1.3 The site is proposed for construction of an exploration wellsite, approximately 1.72ha in area, within which a vertical borehole will be drilled and cored, followed by the drilling of a second borehole with a horizontal section approximately 1,500m in length. Both boreholes will then undergo hydraulic fracture stimulation. Each borehole will then be separately flow tested and, subject to the results obtained, the horizontal borehole may then undergo an extended well test (up to 90 days). Natural gases emitted will be incinerated in 12m high enclosed ground flare systems which produce no visible flames or smoke and attenuate noise. In the event that the exploratory works are unsuccessful, both boreholes will be decommissioned and the site restored. To facilitate the operation, the works will also require a new temporary access road, which will be constructed within arable land to the west of Sutton's Lane.
- 1.4 An extended Phase 1 habitat survey, completed in January 2018, identified the presence of suitable habitats for wintering birds within the site and surrounding areas of land with the potential to be subject to direct and/ or indirect effects during construction, operational and decommissioning activities associated with the proposals. Most significantly, habitats within the site may provide supporting habitat for bird species for which nearby statutory protected nature conservation sites, including the Ribble/Alt Special Protection Area (SPA) and Ramsar, are designated. In order to advise on appropriate avoidance, mitigation and compensation measures for the proposals, Wintering Bird Surveys were advised.
- 1.5 Wintering bird surveys have previously been undertaken at the site as follows. Wintering bird surveys covering approximately 50km<sup>2</sup> were undertaken during the winter period 2013/2014 (Ecology Services Ltd., 2014) as part of early stage scoping to ascertain how wintering birds, specifically pink-footed geese, used the agricultural environment. A total of 21 surveys were conducted, which normally consisted of two dawn and one dusk survey per month, from September 2013 to March 2014, inclusive.
- 1.6 Additional wintering bird surveys focussing on the area around the proposed wellsite and the species pink footed geese, whooper swans and Bewick's swans were undertaken in 2015/2016 (Appendix 1), with a total of thirteen visits between the 30<sup>th</sup> of September 2015 to the 18<sup>th</sup> of March 2016. The surveys included two morning counts per month by one surveyor, timed to coincide with peak morning feeding times for inland sites. Counts were all undertaken within four hours following morning high tides as recommended for inland sites.

- 1.7 All surveys were undertaken adopting species-specific survey techniques as prescribed by the Royal Society for the Protection of Birds (RSPB), Wildfowl and Wetlands Trust (WWT), British Trust for Ornithology (BTO) (Gilbert 1998) and the Wetland Bird Survey (WeBS) core counting process, with amended site-specific variations.
- 1.8 The objectives of the 2018/19 Wintering Bird Surveys were to:
- Record numbers and locations of notable wintering and passage bird species with emphasis on pink-footed geese and flocks of Schedule 1 bird species whooper and Bewick's swans using the site and surrounding areas of land (up to 500m) with the potential to be affected by the proposals;
  - Identify important habitat areas for those species recorded, in particular supporting habitat for species associated with nearby protected nature conservation sites; and
  - Identify potential impacts of the proposals on bird species of conservation interest and provide recommendations, taking these species into account.

## 2.0 Statutory and Planning Context

### *Planning Policy*

- 2.1 The National Planning Policy Framework (NPPF, 2019) places a clear responsibility on Local Planning Authorities (LPA) to contribute to conserving and enhancing the natural and local environment. LPAs should promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species (e.g. Species of Principal importance, Local Biodiversity Action Plan species); and identify and pursue opportunities for securing measurable net gains for biodiversity. The Office of the Deputy Prime Minister (ODPM) Circular 06/2005 provides administrative guidance on the application of the law in relation to planning and nature conservation.
- 2.2 A Local Planning Authority (LPA) has a duty to ensure that protected species and habitats within the UK are a 'material consideration' in the determination of a planning application. Therefore, an LPA is unlikely to determine an application until all relevant information relating to protected species or habitats is submitted to fully inform the application. Relevant information includes adequate surveys and, where required, mitigation strategies, which will need to be submitted to inform a planning application.
- 2.3 Although the UKBAP has been superseded by the UK Post-2010 Biodiversity Framework and, in England, Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011), many Local Authorities have prepared and operate Local Biodiversity Action Plans (LBAPs). LBAPs not only highlight species that are of Principal Importance but also species that are of local importance. LBAPs will be prepared for these species. Listing of a species in a LBAP does not confer any new statutory or planning policy protection. However, impacts upon species prioritised in LBAPs may be a material consideration in a planning application.

### *Legislation*

- 2.4 The Habitats Directive (92/43/EEC) established a network of Natura 2000 sites, within the European Community, with the objective of protecting sites that are considered to be of exceptional importance to rare, containing endangered and vulnerable natural habitats and species. These sites are European designated sites and are known as Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Offshore Marine Sites (OMS). Special Protection Areas (SPAs), classified under Directive 2009/147/EC on the Conservation of Wild Birds for rare, vulnerable and regularly occurring migratory bird species and internationally important wetlands. Planning Policy also recommends that Ramsar sites,

designated under the Ramsar Convention, should be afforded the same level of consideration as the Natura 2000 sites.

- 2.5 The Habitats Directive (92/43/EEC) was transposed into UK law in 1994 by The Habitats Regulations, which was subsequently amended and has now been replaced by the Conservation of Habitats and Species Regulations 2017.
- 2.6 To ensure that the protection of these sites is considered during the planning process at a regional and local level, works in close proximity to or that have the potential to affect a European designated site, require an Assessment of Likely Significant Effect (ALSE). Even where planning permission is not required for a scheme an ALSE should be completed.
- 2.7 Where a development is likely to have a significant effect upon a European designated site, an Appropriate Assessment (AA) of the implications of the works upon a European site, in view of the site's conservation objectives, will be required. The Planning Authority will require either the ALSE or the AA in support of any planning application and Natural England will need to be consulted as part of this process to obtain the correct assents when required. Appropriate assessment (or 'Habitats Regulation Assessment', HRA) is one of the most powerful tools currently available to control the environmental impacts of development with input from both Natural England (NE) and the Competent or Planning Authority.
- 2.8 Sites of Special Scientific Interest (SSSIs) are notified under the Wildlife and Countryside Act 1981 (as amended). The designation provides statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features.
- 2.9 The Wildlife and Countryside Act (WCA) 1981 (as amended), states that all wild birds are protected. Under the WCA, it is an offence to kill, injure or take any wild bird, to take damage or destroy the nest of any wild bird or to take or destroy the egg of any wild bird. A special penalty is levied to any of the above offences being committed in conjunction with a bird listed on Schedule 1 of the WCA.

***Species of Principal Importance***

- 2.10 Section 40 of the Natural Environmental and Rural Communities (NERC) Act 2006 places a statutory duty on public authorities, in exercising their functions, to conserve biodiversity in England. Species of Principal Importance for the conservation of biodiversity in England, identified by the Secretary of State in consultation with Natural England, are listed Section 41 of the NERC Act. The Local Planning Authority and government bodies (e.g. Natural England) will expect the overall design of the development to have regard for the conservation of these species. There are 49 bird Species of Principal Importance included on the NERC Section 41 list.
- 2.11 These are the species found in England which were identified as requiring action under the former UKBAP (see below) and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. Bird Species of Principal Importance are selected, in England, if they fall under one or more of the following criteria; species which are globally threatened and species which are rapidly declining in the UK, i.e. by more than 50% in the last 25 years.

### 3.0 Conservation Status

- 3.1 Birds of Conservation Concern (BoCC 4) is a review of the status of all birds occurring regularly in the United Kingdom. It is regularly updated and is prepared by leading bird conservation organisations. The latest report was published in 2015 (Eaton et al, 2015). The criteria are complex, but generally: Red list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of more than 50% in the last 25 years. Amber list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of between 25% and 50% in the last 25 years. Species that have a UK breeding population of less than 300 or a non-breeding population of less than 900 individuals are also included, together with those whose 50% of the population is localised in 10 sites or fewer and those whose 20% of the European population is found in the UK.
- Red list species include those that are globally threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and have not shown a substantial recovery.
  - Amber list species include those with an unfavourable conservation status in Europe; whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders and those with internationally important or localised populations.
  - Species that fulfil none of the above criteria are green listed. These species are not included in the evaluation.
- 3.2 The leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of the birds that are regularly found within the British Isles (Hayhow et. al., 2017). Seven quantitative criteria were used to assess the population status of each species. These are:
- Global Conservation Status
  - Recent Decline
  - Historical Decline
  - European Conservation Status
  - Rare Breeders
  - Localised Species
  - International Importance

### 4.0 Methodology

- 4.1 The area was compartmentalised into two areas and assigned a Vantage Point (VP) from which a surveyor was able to clearly visually assess the land within that specific area and to note (with the aid of spotting scopes and binoculars) the presence of feeding/roosting birds associated with the protected sites, along with the agri-environment on which they were situated. The numbers of geese and the associated agri-environment were then plotted on a map and notes taken using a field survey sheet. Geese or swans that would only settle for short periods were not included, as this would not be deemed as long-term feeding/roosting activity. Fly-overs were also discounted from the final figures.
- 4.2 A total of 25 surveys were conducted between late September 2018 and mid-May 2019, which consisted of weekly dusk and/or dawn surveys between September to November inclusive (Autumn passage = nine visits), fortnightly December to February inclusive (wintering visits = six visits) and weekly March to mid-May (Spring passage = 10 visits).

Fortnightly daytime observations have also been made throughout the survey period totalling a further 16 site visits.

- 4.3 Dawn surveys were conducted 1hr prior to sunrise until 1hr after to monitor geese as they left their overnight roost from either Formby Point in the west and Simonswood Moss to the south, to move inland to their feeding grounds. Pink-footed geese could easily be identified and counted either flying over or landing to feed in fields within the designated VP site areas. Dusk surveys were conducted from 1hr prior to sunset until 1hr after to check for geese that were still feeding or roosting within the site areas, prior to their return to coastal roosts. Daytime surveys lasted for 2hrs and were undertaken by a single surveyor walking between the two VP locations.
- 4.4 All surveys were undertaken adopting species-specific survey techniques as prescribed by the Royal Society for the Protection of Birds (RSPB), Wildfowl and Wetlands Trust (WWT), British Trust for Ornithology (BTO) (Gilbert 1998) and the Wetland Bird Survey (WeBS) core counting process, with amended site-specific variations.

#### **Constraints**

- 4.5 The survey visits were undertaken under suitable weather conditions when both resident and migrant birds would be present. However, as arable crop cover increases during the season, detectability of birds visually decreases.
- 4.6 Due to the timing of commissioning this work, the surveys missed the early part of the autumn migration season, commencing in late September. The surveys did, however, cover the core wintering season November-February and the Spring migration period and this is not considered to represent a significant constraint.

#### **Personnel**

- 4.7 All survey works were undertaken by Senior Ecologist Mr. S. Booth, Senior Ecologist Ms L. Redgrave MA (Oxon), MSc, CEnv, CECOL, MCIEEM, Ecologist Mr. A. Leishman BSc (Hons), MSc, Ecologist Martyn Barnes BSc (Hons) and Ecologist Chris Piner.

## **5.0 Results and Evaluation**

- 5.1 The peak counts of pink-footed geese each month within 500m of the proposed development site are recorded in Table 1 below. Full survey data is included in Appendix 2. Whooper swans were only recorded on one occasion when 7 were observed on 26<sup>th</sup> October, approximately 270m east of the site. No Bewick's swans were observed during any of the surveys and therefore this species is not considered further in this report. No significant recordings of any other notable species were made during the surveys.

**Table 1:** Peak Monthly Counts of Pink-footed geese (September 2018 – May 2019)

Month	Peak Count
September	4000 (VP2, dawn)
October	740 (VP2, dawn)
November	1400 (VP1, dusk and VP2, dusk)
December	125 (VP1/2, daytime)
January	410 (VP2, dawn)
February	0
March	740 (VP1, dawn)
April	0
May	0

- 5.2 No pink-footed geese were observed within the survey area after 8<sup>th</sup> March 2019. To aid comparison with previous surveys, survey visits undertaken during April and May have been excluded.
- 5.3 The total population of pink-footed goose in the UK is about 360,000 birds, which overwinter here (Musgrove *et al.* 2013). The UK threshold for significant effect is therefore 3,600 (1%).
- 5.4 The northwest region contains several SPAs associated with wintering birds and that there is considerable interchange in movements between the Ribble & Alt Estuary SPA, Morecambe Bay & Duddon Estuary SPA, Mersey Estuary SPA, Dee Estuary SPA and Martin Mere SPA and Ramsar sites. Numbers of pink-footed goose relevant to this assessment are listed below, the data is taken from the BTO WeBS counts between 2012 and 2017<sup>1</sup> and presents the five year average peak counts, calculated from the average of the peak counts in each year.

**Table 2: Regional Peak Counts of Pink-footed Goose**

Site Name	5yr Average Peak
Ribble Estuary	15,008
Alt Estuary	19,593
Morecambe Bay	25,490
Mersey Estuary	165
Dee Estuary (English counties)	5,589
Martin Mere	25,178
Simonswood Peat Moss (Included as this is a major roost site locally)	5,000

**Total 96,023 (5yr average peak) 1% is 960**

- 5.5 The peak count of pink-footed geese at the site level (proposed development site including 500m buffer) in winter 2018/19 was above the 1% National threshold during one of the 32 survey visits during September-March inclusive (approximately 3.1% of the visits). The Regional threshold was exceeded five times during the 2018/19 surveys (approximately 15.6% of the September-March visits) and the Ribble and Alt Estuaries threshold (346) exceeded 10 times (approximately 31% of the September-March visits).
- 5.6 The peak counts during winters 2013/14 (800) and 2015/16 (2,500) fell below 1% of the National threshold but was above the 1% Regional threshold in winter 2015/16 on one occasion during a total of 33 survey visits (approximately 3% of the visits; the peak count was below the 1% Regional threshold in 2013/14. The peak count in both the previous surveys was above the Ribble & Alt Estuaries 1% threshold; exceeded twice during winter 2013/14 (approximately 10% of the visits) and once in winter 2015/16 (approximately 3% of the visits). Wintering flocks of pink-footed geese are highly mobile and move around the landscape in response to availability of food sources.
- 5.7 Considering all the survey visits across the three years, the National 1% threshold was only exceeded once in September 2018 out of a total of 85 visits over the three years (1.2% of visits), the Regional 1% threshold exceeded six times (once in January 2016 and five times

<sup>1</sup> <https://app.bto.org/webs-reporting/>

in 2018/19, representing 7% of visits) and the Ribble and Alt Estuaries 1% threshold thirteen times (once in 2013/14, twice in 2015/16 and ten times in 2018/19, representing 15.3% of all visits).

- 5.8 In designating SPAs, it is the mean of the peak counts over the preceding five years which is used in assessing the significance of numbers of birds at a site. The mean peak count of pink-footed geese for the three winters surveys which have been undertaken within 500m of the proposed development site is 2,433 which is below the National threshold, but above the Regional and Ribble and Alt Estuaries thresholds. The survey data shows that the proposed development site does not regularly support Nationally important numbers. In line with the criteria for designation of SPAs, based on three winters of surveying, the proposed development site can be assessed as regularly supporting Regionally and Ribble and Alt Estuaries important numbers of pink-footed geese. Table 3 summarises the results of the wintering bird surveys undertaken at the proposed development site.

**Table 3:** Peak counts of pink-footed geese and significance in relation to National, Regional and Ribble and Alt Estuaries SPA populations

	2013/14	2015/16	2018/19
Peak Count (month of occurrence)	800 (Dec)	2,500 (Jan)	4,000 (Sept)
Number of Surveys	20	33	32
No. occurrences >1% of Ribble and Alt Estuary SPA Population	2	1	10
No. occurrences >1% of Regional Population	0	1	5
No. occurrences >1% of National Population	0	0	1
% of surveys that exceed:			
Ribble and Alt Estuary SPA threshold	10%	3%	35%
Regional threshold	0	3%	19%
National threshold	0	0	4%

- 5.9 The total population of whooper swan in the UK is 15,000 birds overwintering here (Musgrove *et al.* 2013); the UK threshold for significant effect is therefore 150 (1%). Numbers of whooper swan relevant to this assessment in the Regional context are listed below, the data is taken from the BTO WeBS counts between 2012 and 2017<sup>2</sup> and presents the five year average peak counts.

**Table 4:** Regional Assemblages of Whooper Swan

Site Name	5yr Average Peak
Ribble Estuary	502
Alt Estuaries	8
Morecambe Bay	175
Mersey Estuary	24
Dee Estuary (English counties)	15
Martin Mere	1,504

**Total 2,228 (5yr average peak) 1% is 22**

<sup>2</sup> <https://app.bto.org/webs-reporting/>

- 5.10 The number of whooper swans recorded during the 2018/19 surveys was not significant at the National or Regional levels. The number is, however, significant in the context of the Ribble and Alt Estuaries (the 1% threshold being 5 birds). No whooper swans were observed within the survey area during the 2013/14 and 2015/16 surveys, however, therefore the site is not considered to regularly support significant numbers of this species.

## 6.0 Impacts and Recommendations

- 6.1 The survey data shows that the proposed development site does not regularly support Nationally important numbers of pink-footed geese, however, the site can be assessed as regularly supporting Regionally and Ribble and Alt Estuaries important numbers. The site does not regularly support Nationally, Regionally or Ribble and Alt Estuaries important numbers and no significant effects on whooper swan are therefore anticipated.
- 6.2 The proposed development has potential to impact on wintering pink-footed geese associated with the European designated sites through temporary habitat loss or damage, pollution and disturbance as a result of noise, vibration, movement and lighting at the site.
- 6.3 A Shadow HRA was undertaken in March 2019 using the wintering bird data from September 2018-February 2019 inclusive which concluded that there will be no mortality or significant effects of disturbance/ displacement, lighting, noise or vibration on wintering birds associated with the European designated sites during all phases of the proposed development.

## 7.0 References

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**Figures 1-3**  
Wintering Bird Surveys Maps

**Appendix 1****Birds of Conservation Concern Records for WBS of Site (Winter 2015/2016)**

<b>Date</b>	<b>Species</b>	<b>Number</b>	<b>Dist. (m)</b>	<b>Notes</b>
30/09/15	PFG	2000	800	In stubble fields to NW of site
	L.	40	50	Lapwing on fresh till
	S.	[10]	On Site	Numbers of skylark visible flying in flock throughout the site
	BZ	1/1juv	FO	1 adult & 1 juvenile buzzard flying and foraging over site
12/10/15	PFG	400+	800	Small flock in WC NW of site (Note: High concentration could be seen 2k south at Withins)
	L.	50	50	Lapwing on fresh till east of site
	S.	200	On site	Numerous birds flying in flocks foraging and roosting on site
30/10/15	PFG	300+	800	In WC NW of site
	S.	100+		Numerous birds flying in flocks foraging and roosting on site
13/11/15	L.	100+	400	Numerous lapwing sheltering in WC north of site beyond dyke
04/12/15	PFG	200	500	Small flock feeding in WC NW of site beyond dyke
	BZ	1	On site	Buzzard perched on telephone wires along northern boundary
11/12/15	PFG	250	500	On GS north of site
18/12/15	PFG	350	1000	Feeding in WC north of site
	BZ	1	On site	On boundary
	ML	1	On site	Perched on telephone wire
11/01/16	PFG	2500	400	Large flock in WC south west of site. 1k displaced from Withins by shooting and growing when leaving site
22/01/16	PFG	1000+	1000+	Large flocks visible at Withins south
05/02/16	PFG	10	FO	Few individual birds flying over
	S.	3	On site	Skylark heard singing within site
26/02/16	PFG	100	500	Small flock in WC north of site beyond dyke
	PFG	50	200	Small flock in WS south of site by pylon
	S.	5	500	Skylark activity increasing in grassland and WC north of site beyond the dyke
	L.	20	500	Lapwing activity increasing in grassland and WC north of site beyond the dyke
05/03/16	L., S.	-	500	Lapwing and skylark hunkered down out of sleet on site and beyond
18/03/16	PFG	150	700	Small flock gathering in stubbles south of site (large flocks visible at withins readying for migration north)
	L.	-	400	Lapwing actively flying and nest creation in WC and GS north of site
	S.	-	400	Skylark activity picking up in short grassland and WC

**NB:** up to 10 brown hare seen within site and beyond during March surveys

**NBB:** Area around site subjected to heavy bird scaring activity on WC south and west of site

**Abbreviation:** PFG = Pink-footed goose, L. = Lapwing, S. = Skylark, BZ = Buzzard, ML = Merlin. WC = Winter Crop, GS = Grassland, WS = Winter Stubbles

## Appendix 2

### Survey Data

Survey date	Species: (PG, WS, BS)	Count	Habitat*	Distance (m)	Direction from site	Comments
25.09.18 (dawn)	PG	4000	WS	60	Within same field	
	PG	10	RC	485		Feeding
28.09.18 (day)	PG	1450	WC	235	South	Feeding
	PG	2200	GS	0	North	Feeding
05.10.18 (dawn)	PG	1	WC	380	North	Feeding
	PG	4	WC	180	North	Feeding
	PG	4	WC	120	North	Feeding
10.10.18 (day)	PG	185	WS	50	North	Feeding
	PG	140	WC	215	South	Feeding
	PG	70	WS	75	South	Feeding
	PG	30	WC	420	North	Taken-off
	PG	270	WS	410	North	Feeding
	PG	500	WS	290	East	Taken-off
11.10.18 (dawn)	PG	9	WS	100	East	Feeding
	PG	4	WC	250	North	Feeding
	PG	260	WC	250	North	Feeding
	PG	6	WS	100	East	Feeding
	PG	740	WS	300	North	Landed
	PG	50	WC	350	North	Landed
16.10.18 (dusk)	No Recordings	N/A	N/A	N/A	N/A	N/A
24.10.18 (day)	PG	180	WS	250	North	Landed
26.10.18 (dawn)	WS	7	WS	270	East	Landed/Feeding

Land at Altcar Moss, Formby, Lancashire

Survey date	Species: (PG, WS, BS)	Count	Habitat*	Distance (m)	Direction from site	Comments
01.11.18 (dusk)	PG	18	GS/WS	420	South	Landed
	PG	60	GS/WS	420	South	Landed
	PG	70	GS/WS	420	South	Landed
	PG	8	GS/WS	420	South	Landed
	PG	80	GS/WS	420	South	Landed
	PG	130	GS/WS	460	South	Landed
	PG	115	GS/WS	460	South	Landed
	PG	37	GS/WS	460	South	Landed
	PG	3	GS/WS	460	South	Landed
	PG	30	GS/WS	420	South	Landed
	PG	10	GS/WS	420	South	Landed
	PG	700	GS/WS	460	South	Landed
	PG	150	GS/WS	420	South	Landed
	PG	1400	GS/WS	420	South	Feeding
	PG	90	WC	470	South	Feeding
	PG	70	GS/WS	320	South	Feeding
	PG	1400	GS/WS	310	South	Feeding
	PG	20	GS/WS	485	South	Landed
	PG	16	WS	435	North	Feeding
07.11.18 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
09.11.18 (dawn)	PG	23	WC	500	South	Feeding
21.11.18 (dawn)	PG	140	WS	450	South	Landed
22.11.18 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
28.11.18 (dawn)	RU	3	RC/WS	0	South	Feeding
06.12.18 (dawn)	No Recordings	N/A	N/A	N/A	N/A	N/A

Land at Altcar Moss, Formby, Lancashire

Survey date	Species: (PG, WS, BS)	Count	Habitat*	Distance (m)	Direction from site	Comments
07.12.18 (day)	PG	125	WC	475	East	Feeding
	PG	5	WC	475	East	Taken-off
	PG	120	WC	475	East	Taken-off
18.12.18 (dawn)	No Recordings	N/A	N/A	N/A	N/A	N/A
20.12.18 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
31.12.18 (dawn)	No Recordings	N/A	N/A	N/A	N/A	N/A
03.01.19 (day)	PG	52	RC	425	West	Landed
	PG	82	GS	270	South	Landed
	GP	15	RC	470	North	Landed / Feeding
14.01.19 (dawn)	PG	410	WC	375	North	Landed
17.01.19 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
31.01.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	N/A
04.02.19 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
17.02.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	N/A
21.02.19 (day)	No Recordings	N/A	N/A	N/A	N/A	N/A
05.03.19 (day)	PG	220	WC/GS	590	North	Just outside survey area
	PG	500	WC/GS	590	North	N/A
08.03.19 (dawn)	PG	400	WC	390	North	Flew in from south
	PG	17	WC	390	North	Flew in from south, Landed in same field as above
	PG	11	WC	390	North	Flew in from south, Landed in same field as above
	PG	62	WC	390	North	Gun shots heard, flew in from N, landed in same field as above

Land at Altcar Moss, Formby, Lancashire

Survey date	Species: (PG, WS, BS)	Count	Habitat*	Distance (m)	Direction from site	Comments
	PG	9	WC	390	North	Flew in from N, Landed in same field as above
	PG	55	WC	390	North	Flew in from N, Landed in same field as above
	PG	4	WC	390	North	Flew in from N, Landed in same field as above
	PG	8	WC	390	North	Flew in from N, Landed in same field as above
	PG	12	WC	390	North	Gun shots heard, flew in from S, Landed in same field as above
	PG	45	WC	390	North	Flew in from south, landed in same field as above
	PG	34	WC	390	North	Flew in from south, landed in same field as above
	PG	8	WC	390	North	Flew in from north, landed in same field as above
	PG	50	WC	390	North	Gun shots heard, flew if from S, landed in same field as above
	PG	26	WC	390	North	Flew in from south, landed in same field as above, total c. 740
	No Recordings	N/A	N/A	N/A	N/A	
14.03.19 (dusk)	No Recordings	N/A	N/A	N/A	N/A	
	No Recordings	N/A	N/A	N/A	N/A	
19.03.19 (day)	No Recordings	N/A	N/A	N/A	N/A	Various groups PG flying over N end (max. 140)
21.03.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	Small groups PG seen flying over site (max 60)
	No Recordings	N/A	N/A	N/A	N/A	Small groups PG seen flying over site (max 130)
26.03.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	22 PG seen flying over site
	No Recordings	N/A	N/A	N/A	N/A	
02.04.19 (day)	No Recordings	N/A	N/A	N/A	N/A	
03.04.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	
	No Recordings	N/A	N/A	N/A	N/A	
11.04.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	
	No Recordings	N/A	N/A	N/A	N/A	
16.04.19 (day)	No Recordings	N/A	N/A	N/A	N/A	

Land at Altcar Moss, Formby, Lancashire

Survey date	Species: (PG, WS, BS)	Count	Habitat*	Distance (m)	Direction from site	Comments
18.04.19 (dusk)	No Recordings	N/A	N/A	N/A	N/A	
	No Recordings	N/A	N/A	N/A	N/A	
25.04.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	
	No Recordings	N/A	N/A	N/A	N/A	
30.04.19 (day)	No Recordings	N/A	N/A	N/A	N/A	
03.05.19 (dawn)	No Recordings	N/A	N/A	N/A	N/A	
09.05.19 (dusk)	No Recordings	N/A	N/A	N/A	N/A	
15.05.19	No Recordings	N/A	N/A	N/A	N/A	Marsh harrier flew over survey area to pylon, landed briefly, then flew off 20:34
						*Habitat codes:
						WC = Winter crop (Wheat, rapeseed etc)
						WS = Winter stubbles
						RC = Root crop
						GS = Grassland
						WG = Wet grassland
						B = Bare ground/ tilled