

## **BWAS 2021 Bird Survey Report**

### **Materials and Methods**

The seabird survey was conducted from the 21/03/21 to the 07/04/21 using a single seabird observer. The seabird observer conducted visual survey effort while simultaneously recording all data. The observer's survey effort was maximized and optimized during periods of sea state less than or equal to sea state 6 and with visibility of greater than 300m. Additional visual point sampling (e.g., at oceanographic sampling stations or fishing stations) and incidental recording were also employed; however line transect survey effort was prioritised by the observer. Seabird watches were conducted using a standard single platform line transect survey design while the vessel was travelling at a consistent speed and heading. All observations for seabirds were conducted from the monkey island (deck height 12 m above sea level).

The data collection methodology was based on that originally proposed by Tasker *et al.* (1984) with later adaptations applied to allow correction factors to be applied for missed birds (Camphuysen *et al.*, 2004). The method employed used a single platform line transect survey design with sub-bands to survey birds associated with the water, while flying birds were surveyed using a 'snapshot' technique. Observer effort was concentrated in a bow-beam arc of 90° to one side (i.e., to port or starboard) of the vessel's track-line, however, all seabirds observed outside this area were also recorded.

Survey effort for seabirds associating with the water were concentrated within a survey strip of 300m running parallel and adjacent to the vessels track-line and extending to the horizon. All birds surveyed within this region were recorded as 'in-transect' and assigned to one of four distance sub-bands (A: 0-50m, B: 50-100m, C: 100-200m, D: 200-300m) according to their perpendicular distance from the track-line. This approach allows for the evaluation of biases caused by specific differences in detection probability with increasing distance from the trackline (Camphuysen *et al.* 2004). Seabirds occurring outside of this survey strip were recorded as 'off-transect' and assigned to a separate sub-band (E: >300m). The perpendicular distance to an animal was estimated using a fixed interval range finder (Heinemann, 1981), ensuring each animal is allocated to the correct distance sub-band.

Flying birds were surveyed using 'snapshots', where instantaneous counts of flying birds within a survey quadrant of 300m x 300m were conducted. The periodicity of these 'snapshots' was vessel speed dependent but timed to allow counts to occur as the vessel passes from one survey quadrant to the next. This method minimises biases in counts of flying birds relative to the movement of the vessel (Pollock *et al.*, 2000, Camphuysen *et al.* 2004).

Seabirds remaining with the vessel for more than 2 minutes were deemed to be associating with the vessel (Camphuysen *et al.* 2004) and were recorded as such. Seabirds seen associating with other vessels (i.e. fishing vessels) were also recorded as such.

Searching for seabirds was done with the naked eye, however, Leika Ultravid 8x42 HD binoculars were used to confirm parameters such as species identification, age, moult, group size and behaviour (Mackey *et al.* 2004). A Canon EOS 7D Mark II DSLR camera with a Canon EF 100-400mm F4.5-5.6 IS II

USM telephoto lens was used to visually document other information of scientific interest. Data was also collected on all migratory/ transient waterfowl and terrestrial birds encountered.

The Cybertracker (<http://www.cybertracker.org/>) data collection software package (Version 3.514) was used to collect all positional, environmental and sightings data, and save it to a Microsoft Access database. Positional data was collected using a portable GPS receiver with a USB connection and recorded every 5 seconds.

Each line transect was assigned a unique transect number, and a new transect was started anytime the vessel activity changed (i.e. changing from on-transect to inter-transect). Each subsequent bird observation was also assigned to this unique transect number.

Environmental data was timestamped and recorded with GPS data at the beginning and end of each line transect and also as soon as any change in environmental conditions occurred. Environmental data recorded included; wind speed, wind direction, sea state, swell, visibility, cloud cover and precipitation.

Each observation was timestamped and recorded with GPS data using Cybertracker. Sighting data such as; species identification, distance band, group size, composition, heading, age, moult, behaviour and any associations with cetaceans or other vessels were also recorded on the time stamped Cybertracker sighting record page. Where species identification could not be confirmed, sightings were recorded at an appropriate taxonomic level (i.e. large gull sp., *Larus* sp., Common tern, etc.).

Ancillary data such as line changes, changes in survey activity (e.g. fishing/CTD cast) and fishing vessel activity were also recorded.

## Results

In total, 89 hours and 44 minutes of survey effort was conducted over the course of BWAS 2021. In total, 65 hours and 16 minutes of survey effort were conducted using a line transect methodology, while 20 hours and 16 minutes of effort were conducted using the point sampling methodology. A further 4 hours and 11 minutes of effort were conducted as a casual watch.

A total of 1417 seabird observations were recorded throughout the survey, totalling 29448 individuals. In total, 1822 seabirds were recorded as “in transect”, while 9235 were recorded “off transect”. The species encountered included 18 species from 7 families. A further 39 sightings of terrestrial birds were also recorded, comprising of 687 individuals from 10 different species.

Gannets (*Morus bassanus*) were the most frequently observed and the second most abundant species accounting for 543 observations (38.3% of all observations) and comprising of 11908 individuals in total (40.4% of all encountered individuals.) Of these, 621 individuals were recorded as ‘in transect’.

Fulmar (*Fulmarus glacialis*) were the second most frequently observed and the most abundant species accounting for 389 observations (27.5% of all observations) and comprising of 15527 individuals in total (52.7% of all encountered individuals.) Of these, 864 individuals were recorded as ‘in transect’.

Kittiwake (*Rissa tridactyla*) were the third most frequently observed species accounting for 202 observations (14.3% of all observations). Kittiwake were also the third most abundant species comprising of 1169 individuals in total (4.0% of all encountered individuals.) Of these, 146 individuals were recorded as 'in transect'.

A number of terrestrial species were also recorded during the survey. These included large migratory flocks of species such as greylag goose (*Anser anser*), pink-footed goose (*Anser brachyrhynchus*), whooper swan (*Cygnus cygnus*) and redwing (*Turdus iliacus*). Other terrestrial species encountered included a hooded crow (*Corvus cornix*) and a snow bunting (*Plectrophenax nivalis*).

**Table 1.** Summary of seabird records during the survey.

Common name	Species name	No. of records	No. of individuals	In transect	Off transect
Fulmar	<i>Fulmarus glacialis</i>	389	15527	864	14663
Great Shearwater	<i>Puffinus graves</i>	1	1	0	1
Manx Shearwater	<i>Puffinus puffinus</i>	58	89	31	58
Leach's Petrel	<i>Oceanodroma leucorhoa</i>	1	1	1	0
Gannet	<i>Morus bassanus</i>	543	11908	621	11287
Pomarine Skua	<i>Stercorarius pomarinus</i>	1	1	0	1
Great Skua	<i>Stercorarius skua</i>	66	111	26	85
Black-headed Gull	<i>Larus ridibundus</i>	1	1	0	1
Lesser Black-backed Gull	<i>Larus fuscus</i>	46	382	20	362
Herring Gull	<i>Larus argentatus</i>	4	11	3	8
Great Black-backed Gull	<i>Larus marinus</i>	20	32	6	26
Iceland Gull	<i>Larus glaucoides</i>	1	1	0	1
Kittiwake	<i>Rissa tridactyla</i>	202	1169	146	1023
Guillemot	<i>Uria aalge</i>	35	46	29	17
Black guillemot	<i>Cephus grylle</i>	1	1	1	0
Razorbill	<i>Alea torda</i>	13	40	19	21
Little Auk	<i>Alle alle</i>	1	1	1	0
Puffin	<i>Fratercula arctica</i>	33	124	54	70
Auk sp.	<i>Alcidae sp.</i>	1	2	0	2
<b>Total</b>		<b>1417</b>	<b>29448</b>	<b>1822</b>	<b>27626</b>

**Table 2.** Summary of terrestrial bird records during the survey.

Common name	Species name	No. of records	No. of individuals
Greylag Goose	<i>Anser anser</i>	3	43
Hooded Crow	<i>Corvus cornix</i>	1	1
Meadow Pipit	<i>Anthus pratensis</i>	4	5
Oystercatcher	<i>Haematopus ostralegus</i>	2	5
Pink-footed Goose	<i>Anser brachyrhynchus</i>	4	187
Redwing	<i>Turdus iliacus</i>	13	110
Rock Pipit	<i>Anthus spinoletta</i>	1	1
Snow Bunting	<i>Plectrophenax nivalis</i>	1	1
Whooper Swan	<i>Cygnus cygnus</i>	9	333
Woodpigeon	<i>Columba palumbus</i>	1	1
<b>Total</b>		<b>39</b>	<b>687</b>

## References

Camphuysen, K., et-al (2004). *Towards standardised seabirds at sea census techniques in connection with environmental impact assessments for offshore wind farms in the U.K.: a comparison of ship and aerial methods for marine birds, and their applicability to offshore wind farm development*. NIOZ report to COWRIE (BAM – 02-2002), Texel.

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