

# Winter bird survey of farmland and parkland at Balbriggan, North County Dublin.



## ADDENDUM

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## 1. Introduction

Fingal County Council is currently undertaking a feasibility study for a coastal walking and cycling route between Skerries and the Delvin River, north of Balbriggan in north County Dublin. The feasibility study will cover all lands between the railway line and the coast with the aim of identifying a preferred route option for the coastal greenway. Although located a few kilometres away from the nearest designated site for nature conservation, the impact of any potential route on designated sites and the associated species needs to be considered. While direct impacts on the birds and habitats of the islands off the Fingal coast are considered unlikely, the birds associated with these designated sites and the estuaries further south might utilise the farmland and parkland at Balbriggan during the winter months. These potential ‘*ex-situ*’ impacts need to be considered. To this end, Fingal County Council commissioned BirdWatch Ireland to undertake a bird survey of farmland and parkland along the Balbriggan coast during winter 2019/20.

The survey took place during February and March 2020. The survey area was situated along the Balbriggan coast (Figure 1) and this was divided into a series of survey sections (A-E). These sections were further subdivided into a number of fields (Figure 2). Following completion of the field surveys, a final report was produced in July 2020. Following the report submission, BirdWatch Ireland was requested to provide a field ranking system i.e. to rank the fields in order of their importance for wintering birds. This short report provides the results of this additional assessment.



**Figure 1.** Study area – Balbriggan, north County Dublin.



**Figure 2.** Survey area divided into six section A-E.

## **2. Methods**

### **2.1 Background to evaluation systems**

Relative conservation importance is often an important consideration in the decision-making processes regarding the management of habitats for nature conservation. Assigning relative importance can also be regarded as ‘ecological evaluation’ which is the process of establishing the value (ideally quantitatively) of ecological features, be it habitats or species. Such a process generally begins with a review to determine what parameters to include in the assessment. For species, commonly used criteria are species diversity (species richness), population size (abundance), rarity, and population trend/status, while habitats may be evaluated under such criteria as size, naturalness, rarity and resistance/resilience (e.g. Ratcliffe, 1977, see box below). Key principles for such an evaluation process are:

- It should be as scientifically complex and well-thought out as possible, often the determination of criteria requiring specific studies to inform the thought process,
- It should be objective, standardised and repeatable,
- It should be able to be described clearly (transparency,
- It should be based on sound ecological principles.

CRITERIA FOR EVALUATING NATURE CONSERVATION IMPORTANCE 'Ratcliffe Criteria' (Ratcliffe, 1977)

- Size (extent)
- Diversity
- Naturalness
- Rarity
- Fragility
- Typicalness
- Recorded history
- Position in an ecological/geographical position
- Intrinsic appeal

## 2.2 Devising a method for the Balbriggan survey

The study area for the Balbriggan winter bird study included farmland and parkland at Balbriggan between the railway line and the coast (Figure 1). The survey area was initially divided into five sections (A- E) (Figure 2) and each section was then subdivided into individual fields or suitable habitat areas for survey. Although primarily a terrestrial bird survey, because the study areas bordered the coast, coastal waterbirds were also recorded where shoreline was visible. Bird count data were recorded for each field area on each of six survey days in February and March 2020.

A field evaluation system for wintering birds would ideally include criteria for both bird species and habitats because of bird-habitat associations. Initially habitat criteria were derived such as area, proportion of semi-natural habitats, proportion of semi-natural boundary types, presence of water and presence of ecological connectivity (ecological corridors). However, given the rapid nature of the assessment and lack of quantitative habitat data, it soon became clear that including habitat criteria in an evaluation system would be outside the scope of the study. Therefore, a species evaluation system was devised.

The species evaluation system was based on birds recorded in terrestrial habits (i.e. fields) only. The criteria are shown in Table 1 along with the scoring system used for each. Scores for each criteria and for each field were calculated as per Table 1. The scores were then combined (summed) for each field and the fields then ranked by their overall score.

**Table 1.** Criteria for evaluation of fields using recorded bird data.

Species Criteria (Terrestrial only)	Score
Species Richness (number of species)	Score 1 for each species recorded
Number of Red-listed species	Score 1 for each red-listed species recorded
Number of Amber-listed species	Score 1 for each amber-listed species recorded
Annex 1 species	Score 1 for each annex I species recorded
Number of waterbirds	Score 1 for each waterbird species recorded
Overall number of species of conservation concern	Score 1 for each species of conservation concern defined as: <ul style="list-style-type: none"> <li>• Red and Amber species listed on BoCCI 2013 (Colhoun &amp; Cummins, 2013),</li> <li>• Annex I species,</li> <li>• Bird species listed as Special Conservation Interests (SCIs) for Rogerstown Estuary, Lambay Island and the Skerries Islands Special Protection Areas.</li> </ul>
Total bird numbers (abundance)	For each count date, fields were ranked in terms of total bird numbers from highest numbers to lowest numbers. The median number (50 <sup>th</sup> percentile) was then calculated along with the 25 <sup>th</sup> percentile and 75 <sup>th</sup> percentile. Numbers of birds equal to or higher than the 75 <sup>th</sup> percentile were scored 5; Numbers of birds equal to or lower than the 25 <sup>th</sup> percentile were scored 1; Numbers of birds around the median (50 <sup>th</sup> percentile) were assigned a score of 3.

### 3. Results

#### 3.1 Overview of species diversity and species of conservation interest recorded during the survey

A total of 68 bird species were recorded within the entire survey area between 17<sup>th</sup> February and 23<sup>rd</sup> March 2020 (Table 2). The total species list included three species listed on Annex I of the EU Bird’s Directive (Great Northern Diver, Merlin and Golden Plover) and 32 species that are listed on the *Birds of Conservation Concern in Ireland* (Colhoun & Cummins 2013), including 11 that are Red-listed and are of highest concern (‘R’ in Table 2), and a further 21 species that are Amber-listed (‘A’ in Table 2). The species list also includes 11 waterbird species listed as Special Conservation Interests (SCIs) for nearby Special Protection Areas (Rogerstown Estuary SPA, Lambay Island SPA and Skerries Islands SPA). Note that Table 2 includes species recorded in coastal habitats as well as the fields, and the field evaluation system reported here pertains to birds recorded in fields (terrestrial) only.

**Table 2.** Species recorded during the Balbriggan winter bird surveys February – March 2020. The table highlights Annex I species (EU Bird’s Directive) and Red and Amber-listed species under ‘Birds of Conservation Concern’ (BoCCI) (Colhoun & Cummins 2013). \* denotes a bird species listed as a Special Conservation Interest (SCI) for Rogerstown Estuary SPA, Lambay Island SPA or Skerries Islands SPA.

Common name	Latin name	Annex I	BoCCI 2013	Section A	Section B	Section C	Section D	Section E
Mute Swan	<i>Cygnus olor</i>		A			√		
Light-bellied Brent Goose*	<i>Branta bernicla hrota</i>		A	√	√	√	√	√
Mallard	<i>Anas platyrhynchos</i>						√	
Common Scoter	<i>Melanitta nigra</i>		R					√
Pheasant	<i>Phasianus colchicus</i>			√				
Great Northern Diver	<i>Gavia immer</i>	√		√				
Great Crested Grebe	<i>Podiceps cristatus</i>		A				√	
Fulmar*	<i>Fulmarus glacialis</i>						√	√
Cormorant*	<i>Phalacrocorax carbo</i>		A	√	√		√	√
Grey Heron	<i>Ardea cinerea</i>				√		√	√
Buzzard	<i>Buteo buteo</i>			√	√			
Kestrel	<i>Falco tinnunculus</i>		A		√			
Merlin	<i>Falco columbarius</i>	√	A		√			√
Moorhen	<i>Gallinula chloropus</i>			√				
Oystercatcher	<i>Haematopus ostralegus</i>		A	√	√	√	√	
Ringed Plover*	<i>Charadrius hiaticula</i>				√	√		
Golden Plover	<i>Pluvialis apricaria</i>	√	R	√	√	√		
Grey Plover*	<i>Pluvialis squatarola</i>		A		√	√		
Lapwing	<i>Vanellus vanellus</i>		R	√	√	√	√	
Purple Sandpiper*	<i>Calidris maritima</i>				√	√	√	
Dunlin*	<i>Calidris alpina</i>		R		√	√		√
Snipe	<i>Gallinago gallinago</i>		A	√				√
Curlew	<i>Numenius arquata</i>		R	√	√	√	√	√
Greenshank	<i>Tringa nebularia</i>			√	√	√		
Redshank*	<i>Tringa totanus</i>		R	√	√	√	√	√
Turnstone*	<i>Arenaria interpres</i>			√	√	√	√	
Black-headed Gull	<i>Chroicocephalus ridibundus</i>		R		√	√	√	
Lesser Black-backed Gull*	<i>Larus fuscus</i>		A				√	
Herring Gull*	<i>Larus argentatus</i>		R	√	√	√	√	
Great Black-backed Gull	<i>Larus marinus</i>		A	√	√	√	√	√
Feral Pigeon	<i>Columba livia</i>					√	√	
Stock Dove	<i>Columba oenas</i>		A	√				
Woodpigeon	<i>Columba palumbus</i>			√	√	√	√	√
Collared Dove	<i>Streptopelia decaocto</i>						√	
Magpie	<i>Pica pica</i>			√	√	√	√	
Jackdaw	<i>Corvus monedula</i>			√		√	√	
Rook	<i>Corvus frugilegus</i>			√		√	√	√
Hooded Crow	<i>Corvus cornix</i>			√	√	√	√	√
Goldcrest	<i>Regulus regulus</i>		A	√	√			
Blue Tit	<i>Cyanistes caeruleus</i>			√	√	√		√
Great Tit	<i>Parus major</i>			√	√	√		√
Coal Tit	<i>Pariparus ater</i>			√				
Skylark	<i>Alauda arvensis</i>		A	√	√	√		√
Long-tailed Tit	<i>Aegithalos caudatus</i>			√				

Chiffchaff	<i>Phylloscopus collybita</i>					√		
Blackcap	<i>Sylvia atricapilla</i>					√		
Wren	<i>Troglodytes troglodytes</i>			√	√	√	√	√
Starling	<i>Sturnus vulgaris</i>		A	√	√	√	√	
Blackbird	<i>Turdus merula</i>			√	√	√	√	√
Fieldfare	<i>Turdus pilaris</i>							√
Song Thrush	<i>Turdus philomelos</i>			√	√		√	√
Redwing	<i>Turdus iliacus</i>			√				
Mistle Thrush	<i>Turdus viscivorus</i>		A			√		
Robin	<i>Erithacus rubecula</i>		A	√	√	√	√	√
Stonechat	<i>Saxicola torquatus</i>		A	√	√	√	√	√
Dunnock	<i>Prunella modularis</i>			√	√	√	√	√
House Sparrow	<i>Passer domesticus</i>		A	√	√	√	√	
Grey Wagtail	<i>Motacilla cinerea</i>		R	√	√	√		
Pied Wagtail	<i>Motacilla alba</i>			√	√	√	√	√
Meadow Pipit	<i>Anthus pratensis</i>		R	√	√	√	√	√
Rock Pipit	<i>Anthus petrosus</i>			√				
Chaffinch	<i>Fringilla coelebs</i>			√	√	√		√
Greenfinch	<i>Chloris chloris</i>		A	√	√			
Goldfinch	<i>Carduelis carduelis</i>			√	√	√	√	√
Linnet	<i>Carduelis cannabina</i>		A	√	√		√	√
Bullfinch	<i>Pyrrhula pyrrhula</i>			√	√	√		
Yellowhammer	<i>Emberiza citrinella</i>		R	√	√			√
Reed Bunting	<i>Emberiza schoeniclus</i>			√	√	√		√

### 3.2 Field evaluation

Results of the field scoring for each of the assessment criteria are shown in Tables 3a and 3b. The final ranked positions of the fields are shown in Table 4.



**Table 3a.** Results of the field evaluation – Sections A-C

<b>Species Criteria (Terrestrial only)</b>	<b>Score</b>	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B4a	B5	C1	C2	C3	C4	C5	C6	C7
Species Richness (number of species)	Score 1 for each species recorded	18	19	12	28	18	25	25	19	20	17	14	10	19	26	8	12	5	3	12	5
Number of Red-listed species	Score 1 for each red-listed species recorded	2	2	0	5	1	4	4	4	2	3	3	1	5	7	2	0	2	1	1	1
Number of Amber-listed species	Score 1 for each amber-listed species recorded	4	6	5	8	6	6	6	7	5	3	2	1	5	6	2	2	1	0	4	1
Annex 1 species	Score 1 for each Annex I species recorded	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Number of waterbirds	Score 1 for each waterbird species recorded	1	0	0	4	0	2	3	4	1	0	3	1	5	9	3	0	2	1	0	0
Overall number of species of conservation concern	Score 1 for each species of CC	6	8	5	13	7	10	10	11	7	6	6	2	10	14	4	2	3	1	5	2
Total bird numbers	see methods	5	5	5	5	5	5	5	5	5	5	5	3	5	5	3	3	3	3	3	3
	<b>SUM</b>	37	40	27	63	37	52	53	51	40	34	33	18	49	68	22	19	16	9	25	12
	<b>RANK</b>	12	10	19	2	12	4	3	5	10	15	16	23	7	1	21	22	27	29	20	28

**Table 3b.** Results of the field evaluation – Sections D-E

<b>Species Criteria (Terrestrial only)</b>	<b>Score</b>	D1	D2	D3	D4	D5	D6	E1	E2	E3	E4	E5
Species Richness (number of species)	Score 1 for each species recorded	1	2	21	9	17	7	22	8	15	13	11
Number of Red-listed species	Score 1 for each red-listed species recorded	0	0	3	3	2	1	3	0	3	1	0
Number of Amber-listed species	Score 1 for each amber-listed species recorded	0	1	7	3	6	2	5	2	4	4	2
Annex 1 species	Score 1 for each Annex I species recorded	0	0	0	0	0	0	1	0	0	0	0
Number of waterbirds	Score 1 for each waterbird species recorded	0	0	5	3	4	0	4	0	2	2	0
Overall number of species of conservation concern	Score 1 for each species of CC	0	1	10	6	8	3	8	2	7	5	2
Total bird numbers	see methods	1	1	5	5	5	5	5	5	5	3	3
	<b>SUM</b>	2	5	51	29	42	18	48	17	36	28	18
	<b>RANK</b>	11	10	1	5	3	7	2	9	4	6	7

**Table 4.** Final rankings of fields 1-31

RANK	Field		RANK	Field
1	C1		17	D4
2	A4		18	E4
3	A7		19	A3
4	A6		20	C6
5	B1		21	C2
5	D3		22	C3
7	B5		23	B4a
8	E1		23	D6
9	D5		23	E5
10	A2		26	E2
10	B2		27	C4
12	A1		28	C7
12	A5		29	C5
14	E3		30	D2
15	B3		31	D1
16	B4			

## 6. Discussion

From the outset, the request for a field evaluation using the winter survey data was challenging. This is largely because birds are relatively mobile, and any bird survey can only be viewed as a ‘snapshot’ of any point in time and space. Birds distribution is also inherently linked to habitat type and therefore bird-habitat associations are likely to play a key role. As a consequence the inclusion of habitat criteria would ideally be used in such an assessment. For instance, some of the agricultural fields contained grassland, while others were winter stubble; some areas were parkland (amenity grassland) while other areas comprised more rank and unmanaged habitats. The type of agricultural practice may have played a role (grass, arable, grazed etc) and the agricultural practice in each field is likely to have had a bearing on the species or density of birds found in each particular field. It should also be taken into account that a field in grass in one year, may be arable the following which could totally alter the species diversity or abundance. These factors, along with great differences in the amount of hedgerow (linear woodland) or woodland ‘proper’ between the surveyed fields are likely to have been responsible for the bird distribution recorded. Furthermore, environmental variables are also likely to have played a large part in where birds were at any given time. Some of the fields were partially flooded, which undoubtedly attracted waterbirds, and potentially other species. The degree of flooding is intrinsically linked to levels or rainfall and hence could differ between years or seasons. Waterbirds may also have used the terrestrial habitats depending on environmental factors such as state of the tide, temperature and wind speed or direction. Other factors such as distance to roads, distance to centres of human activity or current levels of disturbance could also be factors. Therefore, a robust scientific evaluation would ideally be underpinned by analyses to determine which variables/criteria are important to explain the bird distribution such as generalized linear modelling or occupancy modelling (e.g. Lv et al. 2019). Such a study was beyond the scope of the current work.

Another limitation in the study could be the lack of consideration of the criteria of size. Generally, the larger the area of habitat, the greater the number of individuals (and possibly diversity) (Chamberlain et al. 2007).

However, this does not always hold true and given the diversity of habitats across the study area, from farmland to parkland, the size of each field may, or may not, have played an important role.

With so many potential underpinning variables, can the field ranking presented here be reliable?

Field C1 was ranked highest in the evaluation system used. This was the largest field in Section C and comprised largely parkland (amenity grassland), edged by semi-natural grassland and bordered by hedgerows. Yet despite the relative unnaturalness of the habitats, this field supported the second highest number of bird species and the highest number of Red-listed species, largely due to the presence of waterbirds (e.g. Light-bellied Brent Goose *Branta bernicla hrota*, Curlew *Numenius arquata*, Redshank *Tringa totanus*) that were attracted to areas of flooded grassland. Therefore, in terms of species of conservation concern, Field C1 was undeniably important, however much of the importance may be temporary and based on the level of flooding of the grassland. Only further studies would clarify this.

Thereafter, Fields A4, A7 and A6 were ranked second, third and fourth most important. This result 'fits' with the notes made by the field observers, and again is largely dependent on the presence of waterbird species of conservation concern and an overall relatively high number of all bird species of conservation concern. Notably, this included the red-listed Yellowhammer (*Emberiza citrinella*) that was recorded in relatively high numbers. Of note is that Section A was the only survey section to record bird numbers ranked as 'high' for all fields. It would appear that the mixture of habitats from winter stubble (arable), grassland, linear woodland (hedgerows) and flooded grassland attracted the greatest diversity and abundance of birds.

At the other end of the scale, field D1 was ranked of least importance for birds. A single bird (Magpie *Pica pica*) was recorded from this field, hence deserving its bottom place.

Overall, it would appear that the evaluation/ranking scheme provides a useful overall summary of the bird interest of the surveyed fields. However, the methodology does have some limitations as discussed above and the inclusion of habitat and environmental parameters would undoubtedly improve the robustness of the method.

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