

The Birds of the Phoenix Park, County Dublin: Results of a survey in Summer 2007 & Winter 2007/ 2008

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Summary

- Urban parks offer a variety of habitats which are of benefit to birds and other wildlife. This survey aimed to quantify the abundance and distribution of birds occurring throughout the Phoenix Park during the breeding period and during the winter.
- The park was divided into 29 sections, each manageable within a survey session. Each section was visited twice during both summer (between the beginning of April and end of June) and winter (between November and February). Observers mapped all birds seen or heard whilst walking along a survey route which took them to within 50m of every part of the section.
- A total of 72 species was recorded, including 62 species during the breeding period and 58 in winter; 35 species are definitely breeding, a further 10 are probably breeding, two (Kestrel *Falco tinnunculus* and Sedge Warbler *Acrocephalus schoenobaenus*) are possibly breeding, while the remaining 24 species are non-breeding.
- Blue Tit *Parus caeruleus*, Great Tit *P. major* and Magpie *Pica pica* were among the most widely distributed during both the breeding and the winter surveys. Jackdaw *Corvus monedula* was the most numerous species recorded during both the breeding and winter surveys, while Blue Tit and Woodpigeon *Columba palumbus* were among the most numerous during the breeding period and Tufted Duck *Aythya fuligula*, Blue Tit and Black-headed Gull *Larus ridibundus* the most numerous during the winter.
- Some 48 species were recorded during both breeding and winter surveys, 14 during the breeding survey only and 10 species during the winter only. Species recorded during the breeding period only included some resident species and a suite of breeding migrants. Species recorded during the winter survey only included the wintering migrants. Two resident species, Buzzard and Grey Wagtail, were also recorded during the winter only.
- The number of species recorded in each section ranged between 20 and 47 (summer range 15 to 41 species, winter range 12 to 41). Greatest diversity was recorded in both summer and winter in the two Zoo sections NE11 and NE13, while fewest species were recorded (between 20 and 23 species) in sections bordering the road, including NE12, NE10 and NE7, and also section SW7.
- The overall density of birds was estimated at 6.9 birds/ha in summer and 8.7 birds/ha in winter. Section densities ranged between 1.1 (SW9) and 28.1 (NE13) in summer and between 1.6 (SW12) and 45.0 (NE13) in winter. The densities recorded in the two Zoo sections (NE11 & NE13) were highest both in summer and winter. In contrast, the Fifteen Acres (section SW9) supported the lowest density of birds in summer.
- Some four species are Red-listed in the Birds of Conservation Concern in Ireland, and include Shoveler *Anas clypeata*, Golden Plover *Pluvialis apricaria*, Black-headed Gull and Herring Gull *Larus argentatus*, while a further 24 are Amber-listed (Table 1). The species recorded also include one European SPEC 2 species (Pochard *Aythya ferina*), and a further 14 SPEC 3 species.
- This park is well-known as a long-established place for Long-eared Owls *Asio otus*, and there are many suitable areas for nesting. However, owls are nocturnal and difficult to survey, and none were recorded. It is likely that Long-eared Owls and possibly also Barn Owls *Tyto alba* do occur in the park.
- Reed Buntings *Emberiza schoenincolus* formerly bred in the Zoo grounds, but were not recorded during this survey. It has possibly been lost as a breeding species due to limited availability of rank and emergent vegetation, uncropped tussocky grass and cereal crops required for nesting and feeding.
- This is the first thorough bird survey of the Phoenix Park, and it is hoped that the results will form a baseline from which we can measure how birds are faring in the park over time.
- A number of recommendations on measures which will enhance the abundance and diversity of birds in the park are provided.

Introduction

The Phoenix Park in Dublin City is over 700 hectares in size, and is among the largest enclosed urban parks in Europe. It includes a number of significant features such as the residences of both the President of Ireland and the American Ambassador, a number of monuments, including the Papal Cross and the Wellington Monument. It also includes many facilities, including the Phoenix Park Visitor Centre, Zoological Gardens, St. Mary's Hospital, Ordnance Survey Ireland and several sports grounds for football, soccer, cricket and polo. Thus, the park is well visited by the public throughout the year.

The park offers a broad diversity of habitats for birds and other wildlife, including large areas of grassland, and a relatively high proportion of deciduous woodland. Previous observations have shown that the park supports a variety of bird species throughout the year, and a total of 88 species has been recorded in recent years (S. Geraty *in litt.*), 49 of which occur regularly.

In February 2007, the Office of Public Works contracted BirdWatch Ireland to carry out a survey of the birds in the Phoenix Park. An interim report was produced in September 2007, and was based on the results of the breeding survey which was undertaken during the summer (Crowe *et al.* 2007). A second thorough survey of the park was carried out during the winter 2007/08. This final report presents the results of both the summer and winter bird surveys.

Methods

The scientific names of all bird species mentioned in the text are presented in Table 1.

Survey design

The Phoenix Park was divided into 29 sections (Fig. 1), each manageable during a survey session, to minimise duplication of counts of the same birds. Sections were labeled according to whether they were northeast (e.g. NE1) or southwest (e.g. SW1) of the main park road. Divisions were roughly based on the discrete areas within the park, such as the Ordnance Survey grounds (section SW3 in Fig. 1) and/or habitat type, such as the large grassland section known as the Fifteen Acres (section SW9 in Fig. 1). Sections ranged from 5.5ha (NE8, a long linear stretch along the northern edge of the park) to 97.9ha (SW9) in size.



Figure 1. Bird survey sections.

Most sections of the park were visited four times, twice during the breeding season, and twice in winter. Breeding season visits were carried out between late March and mid May and again later, between mid May and the end of June. This reflects the abundance of residents and early migrants, which tend to be more

easily detected on the first visit, and later migrants, which are more abundant in the second visit. Most of the survey work was carried out between 06:00 and 09:00 hours to coincide with maximum bird activity, but to avoid concentrated song activity at dawn.

Winter visits were carried out between 15 November and 31 December, and again between 1 January and 15 February. Outside the breeding period, many species form more clustered distributions, i.e. they tend to flock together in larger numbers, and activity tends to be not restricted to the early morning hours. Furthermore, observers must rely a lot more on sightings (compared with the summer) due to the lack of singing outside the breeding period. Survey work during the winter was carried out throughout the day, with two visits to account for winter migrants, and to increase the chances of detecting birds, especially flocks of thrushes which are extremely mobile during the winter period.

The easternmost section (which includes the Wellington Monument and the Peoples Garden) was inadvertently not covered during the breeding period, while section SW12 (the pitches with some marginal woodland) was covered once only in winter (late visit).

Field methods

During each visit, observers walked along a survey route which took them to within 50m of every point in all sections. Playing fields (or similar areas of short grass) were surveyed from a greater distance (within 100m of every point). A field-map of each section was provided, with a grid, 50m x 50m overlain (e.g. Fig. 2). All species seen and heard were recorded directly onto the maps, and bird totals were later summarised. Birds flying over and obviously not interacting with the park in any way were not recorded. Observers also searched for owl pellets under suitable trees.



Figure 2. An example of a survey section (SW1) with the 50m grid overlain.

Data analysis & interpretation

Data are presented for each of the 29 sections and for the overall park combined. Bird densities were estimated for each visit in each season, and in each case the peak of each visit for each season is presented unless otherwise stated. For each species, an assessment was made of the likelihood of it breeding in the Phoenix Park based on the species' distribution and ecology; each species was identified as definitely, probably or possibly breeding.

Results

Species diversity & abundance

A total of 72 species was recorded in the Phoenix Park overall (Table 1), including 62 species during the breeding period and 58 in winter. Of these, 48 species were recorded during both breeding and winter surveys, 14 during the breeding survey only and 10 species during the winter only (Table 2).

It was estimated that 35 species are definitely breeding, a further 10 are probably breeding, two (Kestrel and Sedge Warbler) are possibly breeding, while the remaining 24 species are non-breeding.

Blue Tit, Great Tit and Magpie were among the most widely distributed during both the breeding and the winter surveys (Table 2). Jackdaw was the most numerous species recorded during both the breeding and winter surveys, and the totals recorded were relatively similar (777 in breeding and 810 during the winter), while Blue Tit and Woodpigeon were among the most numerous during the breeding period and Tufted Duck, Blue Tit and Black-headed Gull the most numerous during the winter.

Mute Swan, Wigeon, Kestrel, Golden Plover, Stock Dove, Stonechat, Wheatear, Spotted Flycatcher and Raven were all relatively scarce, with mostly just one or two birds recorded on just one occasion. Shoveler, Pochard and Common Gull were also relatively scarce, although the totals recorded were considerably large, owing to their congregatory behaviour during the winter. House Sparrow was also quite scarce, recorded mostly in the Zoo grounds (section NE13), where it was quite numerous.

No owl pellets were found during pellet searches.

The distribution of all species throughout the 29 sections of the park is summarised in the Appendix.

Seasonal occurrence

Species recorded during the breeding period only included some resident species such as Mute Swan, Great Black-backed Gull, Stock Dove, Stonechat and Raven, and a suite of breeding migrants, including Swift, Sand Martin, Swallow, House Martin, Wheatear, Sedge Warbler, Chiffchaff, Willow Warbler and Spotted Flycatcher. Species recorded during the winter survey only included the wintering migrants Wigeon, Teal, Golden Plover, Snipe, Fieldfare, Redwing, Brambling and Siskin (Siskin is resident, although additional migrants arrive in winter). Two resident species, Buzzard and Grey Wagtail, were also recorded during the winter only.

Conservation concern

Of the species recorded, some four are Red-listed on the recently updated Birds of Conservation Concern in Ireland¹ (Lynas *et al.* 2007) and include Shoveler, Golden Plover, Black-headed Gull and Herring Gull, while a further 24 are Amber-listed (Table 1). The species recorded also include one European SPEC 2² species (Pochard), and a further 14 SPEC 3³ species.

Importance of sections

The number of species recorded overall in each section ranged between 20 and 47 (summer range 15 to 41 species, winter range 12 to 41) (Table 3). Greatest diversity overall was recorded in both summer and winter in the two Zoo sections NE11 and NE13. The total number of species recorded overall was also relatively high in section NE1 (near the Chapalozod gates), while the Peoples Garden (NE14) also supported a relatively high number of species during the winter survey (this section was not covered during the summer). In contrast, fewest species were recorded (between 20 and 23 species) in sections bordering the road, including NE12 (Polo Grounds), NE10 and NE7, and also section SW7. Sections NE6, SW9, NE7 and NE10 were relatively species-poor in summer, while sections NE12, SW12, NE10 and SW7 were species-poor in winter.

The overall density of birds was estimated at 6.9 birds/ha in summer and 8.7 birds/ha in winter. Section densities ranged between 1.1 (SW9) and 28.1 (NE13) in summer and between 1.6 (SW12) and 45.0 (NE13) in winter.

The densities recorded in the two Zoo sections (NE11 & NE13) were highest, and were each over four times higher than the overall park density both in summer and winter. The three sections situated along the northern boundary of the park (NE1, NE3 and NE8) also supported relatively high densities in summer, while sections NE1 and SW8 (the latter is part of the Furry Glen) supported relatively high densities in winter. In contrast, the Fifteen Acres (section SW9) supported the lowest density of birds in summer, while the adjacent playing pitches (SW12), and sections NE2 and NE6 also supported relatively low numbers of birds. With the exception of section NE6, these sections supported fewest birds in winter also.

¹ Species in Ireland are divided into three sub-lists, Red including the most severely threatened, Amber catering for species of medium concern and Green holding the remainder of species (Lynas *et al.* 2007).

² Species whose global populations are concentrated in Europe, and which have unfavourable conservation status in Europe (BirdLife International 2004).

³ Species whose global populations are not concentrated in Europe, but which have unfavourable conservation status in Europe (BirdLife International 2004).

Table 1. Species recorded in the Phoenix Park during summer and winter, their status in Ireland and the Phoenix Park, and an indication of conservation concern in Ireland and Europe.

Species	Status in Ireland ¹	Status in Phoenix Park ²	BoCCI ³	EU conservation ⁴	
Little Grebe	<i>Tachybaptus ruficollis</i>	Resident	BR	Amber	
Cormorant	<i>Phalacrocorax carbo</i>	Resident, some immigration during the winter	NB	Amber	
Grey Heron	<i>Ardea cinerea</i>	Resident	BR		
Mute Swan	<i>Cygnus olor</i>	Resident	NB	Amber	
Wigeon	<i>Anas penelope</i>	Winter migrant, occur mostly between September and April	NB	Amber	
Teal	<i>Anas crecca</i>	Resident, winter migrant from Iceland, Fennoscandia, Russia, Poland, Denmark, Germany, The Netherlands, Belgium & France. Additional captive-bred birds are released each year for hunting.	NB	Amber	
Mallard	<i>Anas platyrhynchos</i>	Resident & winter migrant.	BR		
Shoveler	<i>Anas chlypeata</i>	Resident & winter migrant. Most occur between October and March. Wintering birds originate from breeding populations which range across France, northern Europe, the Baltic and western Russia. Ireland and northern Britain also support the small Icelandic	NB	Red (wintering / passage)	SPEC 3, declining, moderate recent decline (Europe)
Pochard	<i>Aythya ferina</i>	Winter migrant - most occur between October & February	NB	Amber	SPEC 2, declining (Europe)
Tufted Duck	<i>Aythya fuligula</i>	Resident & winter visitor. Birds breeding in southeast England have been seen to move to Ireland, possibly influenced by cold weather	BR	Amber	SPEC 3, declining (Europe)
Sparrowhawk	<i>Accipiter nisus</i>	Resident	BR		
Buzzard	<i>Buteo buteo</i>	Resident	NB		
Kestrel	<i>Falco tinnunculus</i>	Resident	PO	Amber	SPEC 3, declining, moderate continuing decline (Europe)
Pheasant	<i>Phasianus colchicus</i>	Resident, numbers increase in September due to birds released for hunting	BR		
Moorhen	<i>Gallinula chloropus</i>	Resident, augmented by winter visitors - September to April	BR		
Coot	<i>Fulica atra</i>	Resident, augmented by winter visitors - September to April	BR	Amber	
Golden Plover	<i>Pluvialis apricaria</i>	Summer visitor from the France & Iberia (though possibly some remain year-round in Ireland) & winter visitor from Iceland. Most in Ireland between October & February	NB	Red (breeding)	
Snipe	<i>Gallinago gallinago</i>	Summer visitor from west Europe and west Africa, winter visitor from Faeroe Islands, Iceland and northern Scotland	NB	Amber	SPEC 3, declining, moderate recent decline (Europe)
Black-headed Gull	<i>Larus ridibundus</i>	Residents & winter visitors from Britain, but also from Iceland, Norway, Sweden, Finland, Denmark, The Netherlands, Germany, Poland and the Baltic States	NB	Red (breeding)	
Common Gull	<i>Larus canus</i>	Summer visitor from Iberia & northwest Africa occurring between March & September, and winter visitor, probably from Iceland and the Faeroes. Likely that some remain year-round	NB	Amber	SPEC 3, depleted (Europe)
Lesser Black-backed Gull	<i>Larus fuscus</i>	Resident, with some interchange between Ireland and west Britain	NB	Amber	
Herring Gull	<i>Larus argentatus</i>		BR	Red (breeding)	
Great Black-backed Gull	<i>Larus marinus</i>	Largely resident	NB	Amber	
Feral pigeon	<i>Columba livia</i>	Resident	BR		
Stock Dove	<i>Columba oenas</i>	Resident	PR	Amber	
Woodpigeon	<i>Columba palumbus</i>	Resident	BR		
Collared Dove	<i>Streptopelia decaocto</i>	Resident	BR		
Swift	<i>Apus apus</i>	Summer visitor - May - July	PR	Amber	
Skylark	<i>Alauda arvensis</i>	Resident, augmented by winter visitors	PR	Amber	SPEC 3, depleted (Europe)

Sand Martin	<i>Riparia riparia</i>	Summer visitor - April to September	NB	Amber	SPEC 3, depleted (Europe)
Swallow	<i>Hirundo rustica</i>	Summer visitor - April to September	PR	Amber	SPEC 3, depleted (Europe)
House Martin	<i>Delichon urbica</i>	Summer visitor - April to September	PR	Amber	SPEC 3, declining (Europe)
Meadow Pipit	<i>Anthus pratensis</i>	Resident	PR		
Grey Wagtail	<i>Motacilla cinerea</i>	Resident	NB		
Pied Wagtail	<i>Motacilla alba</i>	Resident	PR		
Wren	<i>Troglodytes troglodytes</i>	Resident	BR		
Dunnock	<i>Prunella modularis</i>	Resident	BR		
Robin	<i>Erithacus rubecula</i>	Resident	BR		
Stonechat	<i>Saxicola torquata</i>	Resident	NB		
Wheatear	<i>Oenanthe oenanthe</i>	Summer visitor - April to August	NB	Amber	SPEC 3, declining (Europe)
Blackbird	<i>Turdus merula</i>	Resident, and winter visitor from Norway, Sweden, Germany & Denmark	BR		
Fieldfare	<i>Turdus pilaris</i>	Winter visitor	NB		
Song Thrush	<i>Turdus philomelos</i>	Resident	BR		
Redwing	<i>Turdus iliacus</i>	Winter visitor	NB		
Mistle Thrush	<i>Turdus viscivorus</i>	Resident	BR		
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	Summer visitor - April to August	PO		
Blackcap	<i>Sylvia atricapilla</i>	Summer visitor and winter visitor, origins of breeding and wintering birds differ.	PR		
Chiffchaff	<i>Phylloscopus collybita</i>	Summer visitor - April to August	PR		
Willow Warbler	<i>Phylloscopus trochilus</i>	Summer visitor - April to August	PR		
Goldcrest	<i>Regulus regulus</i>	Resident	BR		
Spotted Flycatcher	<i>Muscicapa striata</i>	Summer visitor	NB	Amber	SPEC 3, depleted (Europe)
Long-tailed Tit	<i>Aegithalos caudatus</i>	Resident	BR		
Coal Tit	<i>Parus ater</i>	Resident	BR		
Blue Tit	<i>Parus caeruleus</i>	Resident	BR		
Great Tit	<i>Parus major</i>	Resident	BR		
Treecreeper	<i>Certhia familiaris</i>	Resident	BR		
Jay	<i>Garrulus glandarius</i>	Resident	BR		
Magpie	<i>Pica pica</i>	Resident	BR		
Jackdaw	<i>Corvus monedula</i>	Resident	BR		
Rook	<i>Corvus frugilegus</i>	Resident	BR		
Hooded Crow	<i>Corvus corone cornix</i>	Resident	BR		
Raven	<i>Corvus corax</i>	Resident	NB		
Starling	<i>Sturnus vulgaris</i>	Resident, augmented by winter visitors	BR	Amber	SPEC 3, declining (Europe)
House Sparrow	<i>Passer domesticus</i>	Resident	BR	Amber	SPEC 3, declining (Europe)
Chaffinch	<i>Fringilla coelebs</i>	Resident, augmented by winter visitors	BR		
Brambling	<i>Fringilla montifringilla</i>	Winter visitor	NB		
Greenfinch	<i>Carduelis chloris</i>	Resident	BR		
Goldfinch	<i>Carduelis carduelis</i>	Resident - some extra influx in winter.	BR		
Siskin	<i>Carduelis spinus</i>	Resident, augmented by winter visitors	NB		
Linnet	<i>Carduelis cannabina</i>	Resident	NB	Amber	SPEC 3, declining (Europe)
Lesser Redpoll	<i>Carduelis cabaret</i>	Resident & passage/ winter visitors	NB		
Bullfinch	<i>Pyrrhula pyrrhula</i>	Resident	BR		

1. From Wernham *et al.* (2002)
2. BR = definitely breeding, PR = probable breeding, PO = possible breeding & NB = non-breeding
3. See Lynas *et al.* (2007) for further definition
4. From BirdLife International 2004.

Table 2. Species distribution in summer and winter, indicating the number of sections in which each was reported, as well as the maximum recorded. Shaded cells represent those species which were recorded in only one season.

Species	Number sections		Max. recorded	
	Summer	Winter	Summer	Winter
Little Grebe	5	5	14	5
Cormorant	3	3	4	2
Grey Heron	14	5	31	31
Mute Swan	1		1	
Wigeon		1		1
Teal		2		16
Mallard	17	7	209	242
Shoveler	1	2	6	69
Pochard	1	2	1	96
Tufted Duck	3	5	155	419
Sparrowhawk	3	6	5	5
Buzzard		2		2
Kestrel	3	1	2	1
Pheasant	16	3	20	10
Moorhen	6	8	40	69
Coot	4	5	56	111
Golden Plover		1		12
Snipe		2		3
Black-headed Gull	4	10	35	352
Common Gull	1	3	1	27
Lesser Black-backed Gull	2	2	3	2
Herring Gull	7	7	7	9
Great Black-backed Gull	4		10	
Feral pigeon	3	7	93	101
Stock Dove	1		2	
Woodpigeon	28	25	404	265
Collared Dove	8	2	34	9
Swift	14		104	
Skylark	8	3	18	21
Sand Martin	3		34	
Swallow	17		87	
House Martin	5		38	
Meadow Pipit	6	1	45	3
Grey Wagtail		6		14
Pied Wagtail	2	3	1	5
Wren	26	19	156	84
Dunnock	23	11	58	38
Robin	24	21	134	154
Stonechat	1		2	
Wheatear	1		2	
Blackbird	28	26	265	239
Fieldfare		5		76
Song Thrush	19	17	53	71
Redwing		20		175
Mistle Thrush	26	28	89	97
Sedge Warbler	7		36	
Blackcap	11	4	30	7
Chiffchaff	7		7	
Willow Warbler	6		8	
Goldcrest	20	22	38	93
Spotted Flycatcher	1		1	
Long-tailed Tit	14	15	43	86
Coal Tit	23	27	91	140
Blue Tit	28	29	466	385
Great Tit	28	28	213	242
Treecreeper	19	18	42	33
Jay	16	14	14	14
Magpie	28	29	243	278
Jackdaw	28	29	777	810
Rook	25	24	169	225
Hooded Crow	26	28	89	157
Raven	1		1	
Starling	17	12	121	272
House Sparrow	2	1	36	12
Chaffinch	25	26	135	286
Brambling		3		9
Greenfinch	20	19	40	88
Goldfinch	10	8	11	36
Siskin		9		92
Linnet	3	3	8	4
Lesser Redpoll	4	7	5	39
Bullfinch	9	9	13	10

Table 3. Diversity and abundance of birds throughout the park sections.

Section	Area (ha)	No. species			Bird density	
		Summer	Winter	Overall	Summer	Winter
NE1	8.4	25	22	46	14.6	19.8
NE2	45.7	23	17	29	3.8	2.1
NE3	8.2	27	18	28	18.1	12.7
NE4	24.5	22	23	26	5.6	7.9
NE5	8.3	22	18	24	11.8	12.9
NE6	14.5	15	25	26	3.0	10.3
NE7	7.4	17	17	22	8.1	13.8
NE8	5.5	19	15	24	22.0	14.4
NE9	35.6	28	34	41	5.5	7.3
NE10	9.4	17	14	23	5.6	4.5
NE11	15.5	41	36	46	25.9	36.5
NE12	16.3	19	12	20	8.6	3.7
NE13	24.3	37	41	47	28.1	45.0
NE14	24.5		37	37		14.4
SW1	19.8	29	16	31	4.9	5.1
SW2	12.6	30	18	32	8.9	9.4
SW3	20.2	28	25	34	6.4	9.7
SW4	41.4	30	24	35	4.7	8.2
SW5	17.6	30	17	32	9.4	7.4
SW6	13	28	21	30	11.5	11.2
SW7	6.5	19	14	23	8.5	10.0
SW8	11.7	27	22	32	10.5	27.2
SW9	97.9	16	18	24	1.1	3.3
SW10	35.7	30	24	36	10.9	11.4
SW11	36.1	28	19	33	4.0	2.7
SW12	51.7	29	13	30	3.2	1.6
SW13	34.9	30	26	37	8.6	7.0
SW14	27.2	25	31	37	4.8	10.8
SW15	34.1	25	23	30	4.1	4.5

Discussion

Diversity & abundance

This survey work has shown the presence of large numbers as well as a great diversity of birds in the Phoenix Park, including a variety of summer and winter migrants, as well as up to 47 breeding species. The absence of any previous thorough bird surveys of the Phoenix Park precludes us from making comments on any changes in numbers and/ or the distribution of species. It is hoped that the results from this breeding and wintering survey, will form a baseline from which we can compare how birds are faring in the park over time.

The total number of species recorded represents roughly 35% of all species regularly occurring in Ireland. These can be described within the following 16 bird groups:

- Waterbirds – Some 19 waterbird species were recorded, including seven which are considered to breed in the park. Wigeon and Pochard are winter visitors, while Golden Plover and Snipe occur in Ireland year-round, although their winter populations (and origins thereof) differ from those occurring in Ireland during the summer/ breeding season. All other waterbird species are resident in Ireland, although numbers of most are enhanced by winter visitors. Waterbird numbers recorded in the park during the winter were generally higher than in summer, due to the congregatory nature of wintering waterbirds; Mallard, Tufted Duck and Black-headed Gull were particularly numerous. While most waterbirds are confined to wetlands, the two wader species (Golden Plover and Snipe) and the gull species feed on terrestrial invertebrates, and were (also) recorded in sections with no waterbodies present.
- Birds of prey – Small numbers of just three species were recorded; Sparrowhawk is considered as breeding in the park, Kestrel is possibly breeding, while Buzzard is non-breeding, and was recorded during the winter survey only. This latter species has been expanding in numbers and range throughout Ireland in recent decades, and it is likely that they will become more widely dispersed and abundant in the park over time, especially during the winter; they typically nest in trees or cliffs, usually where they have access to open land including farmland, moorland and wetland, where small prey is available.

- Gamebirds – Pheasant breeds in the park, and was widespread and numerous, especially during the summer months, throughout many areas. Pheasant is extremely widespread in farmland habitats throughout Ireland.
- Pigeons & doves – Some four species were recorded, and all were considered to be breeding. Woodpigeon was the most widespread and numerous during both the summer and winter surveys. Feral Pigeon was also quite numerous. Just two Stock Doves were recorded during the summer survey only, both in section SW5. Stock Dove is highly dependent on woodland, specifically mature patches of deciduous woodland for nesting. With such a preponderance of suitable nesting areas throughout the park, it is perhaps the case that the limited availability of feeding areas (tillage) in Dublin City may be limiting numbers present in the park. Stock Doves may also be outcompeted by Jackdaws (which were very numerous and widespread throughout the park) for nest holes.
- Swifts – Swift is a summer visitor which spends most of its life on the wing. It was considerably widespread and abundant throughout the park. They breed almost exclusively in old buildings in towns and villages, where their nests are located high up in the roof space under the eaves.
- Larks – Skylark requires rough grassland for nesting, and was certainly more abundant in many of the sections which were dominated by this habitat throughout the park, especially the *Fifteen Acres* (section SW9). This species has shown dramatic declines throughout Europe in recent decades. The switch from spring to autumn sowing of cereals has led to a loss of the Skylark's most strongly selected wintering habitat and best food source. Skylark has also been shown to decline in Ireland over the past decade (Coombes *et al.* 2006).
- Swallows & martins – These are summer visitors, and all three species which occur in Ireland were reported in the park. Swallows prefer outbuildings which provide ledges and nooks and crannies for nesting, while House Martins build nests on outer walls of buildings under the eaves. Both species probably breed in many sections of the park. Sand Martin was only recorded in the two Zoo sections (NE11 & NE13), as well as in section SW12. This species nests in colonies; they excavate tunnels in sandy, dry vertical banks in railway cuttings, riverbanks and sea-cliffs, and occasionally in holes in brickwork. It is highly unlikely that Sand Martins are breeding in the park.
- Chats & thrushes – These groups were well represented in the park, with ten species recorded, all of which are resident, except Wheatear which is a summer visitor, and Redwing and Fieldfare which are winter visitors. It is likely that all of the resident species are breeding in the park, with the exception of Stonechat, which was relatively scarce.
- Warblers – All of the five warbler species recorded are at least possibly breeding in the park, and all are summer visitors, with the exception of the resident Goldcrest.
- Flycatchers – One single Spotted Flycatcher was recorded in section NE5 during the breeding survey. This species is a summer migrant, and is relatively scarce in Ireland, and an unlikely breeding species in the park.
- Tits – All four regularly occurring tit species in Ireland are resident, and were relatively widespread and abundant throughout the park during this survey.
- Treecreepers – Treecreeper is a resident species, and was widespread and abundant throughout the park during, especially where Cypress trees were present.
- Crows – All corvid species regularly occurring in Ireland were recorded in the park, with the exception of Chough, a coastal species recorded predominantly in the south and west of the country. Most were widespread and abundant, and considered to be breeding, with the exception of Raven, which was recorded in section SW1 during the summer only; this species favours upland and/ or coastal areas for nesting. It is particularly encouraging that Jay was recorded in at least 14 sections in each of the summer and winter surveys. This species is dependent on broad-leaved woodland, and is relatively scarce in Ireland, detected in a very small proportion (2%) of the sample of sites surveyed as part of the national scheme for monitoring terrestrial breeding birds (the Countryside Bird Survey, CBS) (Coombes *et al.* 2006).
- Starlings – Starling was widespread and abundant during both the summer and winter surveys. Higher numbers in winter may reflect the immigrant birds from eastern Europe and Scandinavia This

species is highly congregatory, and regularly features among the most abundant species recorded during both the CBS and BirdWatch Ireland's winter Garden Bird Survey (GBS).

- Sparrows – House Sparrow was surprisingly scarce during this survey; almost all were recorded (in flocks of between 6 and 33 birds) in one of the Zoo sections (NE13), with the exception of section NE10 (polo grounds) where three were recorded during one of the summer visits. This noisy and gregarious species is especially prevalent around human habitation. They nest in holes in buildings, and can also be seen congregating in large numbers areas where wall-climbing plants are available for roosting. They are often present where food (seed and scraps) is provided. House Sparrow is consistently ranked among the top-20 most recorded species during the GBS, recorded in 80% of gardens (Crowe 2005).
- Finches – Eight species were recorded, including the winter visitor Brambling, which is highly scarce in Ireland. It is likely that most of the Siskins recorded were also winter visitors, as they were absent during the summer survey, and the resident population which breeds and occurs year-round in Ireland is small. Chaffinch, Greenfinch, Goldfinch and Bullfinch were all relatively widespread and abundant throughout the park. Linnet and Redpoll were more scarce, and are unlikely to be breeding in the park. Linnet in particular is limited by the lack of arable weeds used for feeding and hedges for nesting, while nesting Redpolls show a preference for birch and willow scrub. Like the House Sparrow, finches are generally prevalent where supplementary food is available. Most species within this group have fared particularly well over the past 10 years (Crowe 2005, Coombes *et al.* 2006), especially Goldfinch. This species has only in relatively recent times begun to use food provided in gardens (Glue 1996).

Previous observations in the park have indicated that a variety of other species may also be present. S. Geraty (*in litt.*) reported the presence of both Long-eared Owls *Asio otus* and Barn Owls *Tyto alba*. Both species are nocturnal and difficult to survey. Neither was recorded during the present surveys, and no owl pellets were found during searches. However, the Phoenix Park is well-known as a long-established place for Long-eared Owls. There are many suitable areas for nesting; they usually nest quite high up in an already existing nest (of other larger species such as corvids or even Woodpigeons) in conifers, situated near open areas over which they can hunt their prey (small mammals). It is also likely that Barn Owls occur, and possibly even nest, in the park. They prefer scattered woods and rough grasslands (the latter for hunting over), and will nest in old tree holes and in barns and old buildings.

S. Geraty (*in litt.*) also reported the occurrence of Kingfisher *Alcedo atthis* at the Quarry Pond and the Zoo ponds. It is very possible that this species continues to use the park waterbodies for feeding (on small fish). However, there is a lack of suitable nesting banks in the park. Geraty also reported Light-bellied Brent Geese *Branta bernicla hrota* flying over the park. Ireland plays host to almost the entire population which breeds in high-arctic Canada, and which has been expanding considerably in recent years. They are primarily coastal grazers, which prefer to feed on eelgrass and *Enteromorpha* spp. However, their numbers are now almost double what they were 10 years ago, while their preferred food supply is becoming increasingly limited. Therefore, increasing numbers are being forced to feed elsewhere, and earlier, as the winter season progresses. As an alternative, the geese have become adept at feeding on short grass, and show preference for parks and pitches. It is highly likely that Phoenix Park grasslands would be suitable, and may well be used by feeding geese in future winters.

It was perhaps surprising that Reed Bunting *Emberiza schoeniculus* was not recorded. This species has formerly bred in the Zoo grounds (S. Geraty *in litt.*, P. Phillips pers. obs.). It typically nests and forages in rank and emergent vegetation, but also occasionally in some farmland habitats (uncropped tussocky grass, cereal crops, oil-seed rape or set-aside).

Variation in species diversity and abundance throughout the park

There was considerable variation in bird species richness and abundance throughout the Phoenix Park during both the summer and winter surveys. It is not too surprising that the sections with waterbodies supported the greatest diversity and abundance of birds, given the relatively high numbers of waterbird species present, most of which are entirely dependent on waterbodies, and are highly congregatory.

It is likely that the large numbers of ducks and Black-headed Gulls recorded within the Zoo grounds at least partially resulted in the high densities recorded in these sections. However, numbers of most other non-wetland bird species were also more abundant around the Zoo, especially Starlings, Feral Pigeons, Jackdaws

and Blackbirds, due to a combination of provisioning of food, especially spilt grain, to animals, production of manure by herbivores, compost spreading in certain areas which would naturally enhance invertebrate communities, and predator control.

Since the early 1900s, very little woodland remains in Ireland. At 9.5% (McAree 2002), it is the least wooded country in Europe. Thus, it is pleasing to see such an abundance of woodland, particularly broad-leaved, situated in the middle of this city park. As well as nesting areas, woodland areas also provide shelter and roosting areas, and also an abundance of invertebrate prey and other plant food. While most of our woodland bird species prefer native deciduous trees over conifers, others such as Goldcrest, have been shown to favour conifers. Furthermore, Cypress trees are well used by Treecreeper and roosting tits and finches. Many of the wooded sections of the park, particularly those which line the northern boundary, supported relatively high densities of birds.

The lack of a well-structured understorey throughout many sections of the park, presumably due to browsing Fallow Deer *Cervus dama*, may have resulted in the depauperate bird communities present in some woodland sections, especially NE6, NE7 and SW8.

Chamberlain *et al.* (2007) found that areas with rough grass, especially those with unmanaged and rank grass with weedy patches and nettle beds, were more species rich and supported substantially more birds. They concluded that these areas probably supported more invertebrate prey (and weed seeds later in the winter), and thus served more as a food resource than a suitable nesting area. During this survey, the grass in several of the open grassland sections was too short to support nesting birds. Accordingly, these sections tended to support fewer birds and fewer species. Similarly, areas of short mown grass supported fewer birds, although gulls, starlings, thrushes, wagtails and crows were recorded feeding in these areas, with prey more easily seen and more accessible.

Birds of conservation concern in Ireland and Europe

There has been much change to Ireland's landscape over the past century, especially with the intensification of agriculture since the early 1970s, and increased afforestation. Birds and other wildlife have had to either adapt to these changes, or shift in range. Many significant changes in the distribution and abundance of Ireland's birds have been witnessed, and proven through a comparison between the two breeding atlas surveys carried out in Ireland during the late 1960s (Sharrock 1976) and followed up on during the late 1980s (Gibbons *et al.* 1993). The additional information on species distribution and range gathered through the comparison of these atlases, along with the establishment of ongoing national monitoring schemes for wintering waterbirds and common and widespread breeding birds, facilitated an assessment of species of conservation concern in Ireland (Newton *et al.* 1999). This assessment has been recently updated (Lynas *et al.* 2007).

This survey has shown that the Phoenix Park supports a variety of species which are of conservation concern in Ireland and/ or Europe. The 28 species of conservation concern in Ireland include four which are red-listed. These include:

- Shoveler – Numbers wintering in Ireland have undergone an average annual decline of almost 3% since the mid-1990s (Crowe *et al.* 2008), and is considered to be declining in Europe (BirdLife International 2004).
- Golden Plover – Numbers breeding in Ireland, where it is restricted to the upland areas of the northwest, have been in decline over the past 50 years (Lynas *et al.* 2007). However, this population differs from that which occurs in Ireland during the winter, and wintering birds were recorded in the park. These birds are from the population which breeds in Iceland and the Faeroes, which is considered to be stable (Wetlands International 2006).
- Black-headed Gull – There has been a significant decline in numbers and the breeding range of this species over the past 50 years (Lynas *et al.* 2007), probably the result of predation by Mink *Mustela vison* (Mitchell *et al.* 2004).
- Herring Gull – Breeding numbers have declined significantly over the past 50 years (Lynas *et al.* 2007) due to avian botulism, a disease caused by the ingestion of the bacterium *Clostridium botulinum* which is prevalent in decomposing organic matter and organic waste in refuse tips, upon which Herring Gulls regularly feed (Mitchell *et al.* 2004).

Remaining Amber-listed species consisted mostly of waterbirds:

- Breeding Little Grebe, Cormorant, Teal, Common Gull, Lesser Black-backed Gull and Great Black-backed Gull have suffered declines in numbers and/ or range, and/ or have relatively localised ranges.
- Wintering Wigeon and Tufted Duck are relatively localised, and Tufted Duck is an EU SPEC 3 species. Mute Swan is Amber-listed on the basis that at least 20% of the non-breeding population occurs in Ireland. This population is considered to be resident.
- Both breeding and non-breeding Pochard and Coot are Amber-listed; both are SPEC 2 species, and thereby qualify, while Pochard is a breeding rarity, and is relatively localised during the non-breeding period, and Coot has suffered a decline in breeding range, and is also localised during the non-breeding period.
- Snipe is an EU SPEC 3 species, and thereby qualifies as Amber-listed.

All other Amber-listed species present in the park are listed as EU SPEC 3, with the exception of Linnet, which is SPEC 2, and Stock Dove, which is not of European conservation concern, but whose numbers have declined substantially over the past 50 years (Lynas *et al.* 2007).

Recommendations for enhancing bird diversity

There are many ways in which urban green spaces can be managed while enhancing biodiversity. The following recommendations may be possible for some areas of the park:

- Adopt a long-term policy on tree-planting using a variety of native species, and avoiding even-age planting. This would be best done away from formal avenues of trees.
- Ivy allowed to grow on some trunks provides additional nest sites, and food (berries) during later winter when other berries are depleted. It also supports invertebrate prey. Fallen trees, branches and leaf-litter if left, also support invertebrate communities, fungi and other taxa.
- Erect deer exclosures in some woodland areas to encourage natural regeneration of trees and the development of a well-structured and diverse understorey.
- There were relatively few areas of scrub around the park. A good mix of short to tall scrub is of benefit to nesting birds. Planting of native Hawthorn and Blackthorn is encouraged, as these are rich in invertebrates and provide berries later in the year.
- When cutting back scrub and shrubs, try not to cut all patches in the same year, that way a range of growth stages will be available. Avoid any radical management actions during the breeding period (March – September).
- Areas of longer more rank grass are valuable habitats to wildlife. A strip of longer grass around shorter mown grass, and preferably bordering other natural habitats such as trees and/or shrubs, cut just once or twice a year, could assist in increasing the numbers of flowers and insects.
- An additional zone of rank vegetation cut in alternate years would encourage larger seeding plants, and provide food and shelter for nesting birds. Areas of longer grass should not be mown during the breeding period, as there may be ground-nesting birds present.
- Minimise the use of pesticides, herbicides and artificial fertilizer as much as possible, at least in some areas of the park.
- Planting of wildflower meadows and other crops would allow birds to feed on a huge ‘bird table’ of seeds, especially during the winter months. Crops, such as Linseed, provide a huge resource for birds and attract large flocks of seed-eating species such as Greenfinch, Linnet, Chaffinch, Goldfinch and Redpoll.
- Create more ponds and small lakes around the park.
- Swallows and House Martins may choose to nest under eaves. Starlings and Swifts may nest in the roof itself. House Sparrows can be encouraged away from roof spaces by providing nest boxes attached to a wall, especially if near a climbing plant.

- Additional nestboxes and bird tables will also assist in attracting more birds. Many people get great pleasure from feeding birds, and appropriately placed feeders and bird tables with seating nearby will undoubtedly generate some interest from park visitors.
- Interpretive material will help people appreciate why these areas are necessary for wildlife.

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Appendix

The distribution of all bird species recorded during summer and winter surveys. Cells shaded orange indicate presence in summer only, while blue indicates presence during winter only and green indicates presence during both surveys.

	NE1	NE2	NE3	NE4	NE5	NE6	NE7	NE8	NE9	NE10	NE11	NE12	NE13	NE14	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14	SW15	
Little Grebe		1							1		1		1					1		1									1	
Cormorant		1														1												1		
Grey Heron		1					1		1		1	1	1		1	1	1	1	1	1				1			1		1	
Mute Swan											1																			
Wigeon											1																			
Teal											1		1																	
Mallard		1	1						1	1	1	1	1	1	1		1	1	1	1		1	1	1	1				1	
Shoveler											1		1																	
Pochard											1		1																	
Tufted Duck									1		1		1					1												
Sparrowhawk									1					1			1			1		1		1			1	1		
Buzzard																1	1					1		1			1	1		
Kestrel																		1					1				1			
Pheasant		1				1			1		1		1		1	1	1	1	1	1	1	1		1	1	1	1		1	
Moorhen		1							1		1		1					1											1	
Coot											1		1																1	
Golden Plover																							1							
Snipe																	1						1							
Black-headed Gull		1						1			1	1	1	1								1		1		1	1	1	1	
Common Gull		1																					1				1	1		
Lesser Black-backed Gull																1							1				1		1	
Herring Gull								1			1		1			1	1								1	1	1	1	1	
Great Black-backed Gull									1	1													1			1				
Feral pigeon		1			1	1			1			1		1												1	1			
Stock Dove																											1	1		
Woodpigeon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Collared Dove			1	1				1	1		1		1											1			1	1		
Swift	1		1	1		1					1		1		1							1		1	1	1	1	1	1	
Skylark																		1					1	1	1	1		1	1	
Sand Martin																										1				
Swallow		1							1	1		1			1	1	1					1	1	1	1	1	1	1	1	
House Martin	1		1								1		1																1	
Meadow Pipit		1																					1							
Grey Wagtail											1						1							1	1			1		
Pied Wagtail													1															1		
Wren	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Dunnock	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Robin	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

