



Countryside Bird Survey Report

1998-2007





Cover picture: Swift. – *Mike Langman (rspb-images.com)* **This page:** Pastoral scene. – *Oran O'Sullivan*

Countryside Bird Survey Report 1998-2007 (Report No. 3)

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Summary



The Countryside Bird Survey (CBS) has been in operation since 1998. Its primary aim is to monitor breeding bird populations in the Republic of Ireland.

A random sample of 10 km squares was selected and, within each, the most southwesterly 1 km square was surveyed twice during each breeding season. Bird numbers are counted along two roughly parallel 1km transects in each square.

A total of 397 squares have been surveyed, with between 259 and 325 squares covered in any one season. Coverage was greatest in the east and southeast regions, and poorest in the northwest and south. Nonetheless, the number of squares covered regularly in each region was deemed adequate for

meaningful analyses of the population trends of several species, including trends at a regional level. Some 392 squares were surveyed in two or more seasons and were included in trend analyses.

The total number of species recorded was 145. Some 62 species occurred in 20 or more squares, and these included 18 species of conservation concern in Ireland.

Wren *Troglodytes troglodytes*, Robin *Erithacus rubecula*, Blackbird *Turdus merula* and Chaffinch *Fringilla coelebs* were the most widespread occurring species, being found in 90% or more of squares, while Rook *Corvus frugilegus*, Starling *Sturnus vulgaris* and Wren were the most abundant.

Trend analyses were undertaken on 57 species, these being the species which were recorded in 20 squares or more. Some 25 species showed increasing trends over the 10-year period since 1998, nine species declined, while the remaining 23 species remained relatively stable. Pigeons, warblers, tits, finches and buntings fared particularly well, with no species among these groups showing

declines. Greatest increases were seen in Stonechat *Saxicola torquata*, Blackcap *Sylvia atricapilla*, Spotted Flycatcher *Muscicapa striata*, Goldfinch *Carduelis carduelis*, Redpoll *C. flammea* and Bullfinch *Pyrrhula pyrrhula*, while greatest declines were in Kestrel *Falco tinnunculus*, Swift *Apus apus*, Skylark *Alauda arvensis* and Mistle Thrush *Turdus viscivorus*.

Most of the national trends were consistent across sampling regions. Notable exceptions included Swallow, which increased in the southwest and declined in the midlands, and Song Thrush *Turdus philomelos*, which increased in the northeast and declined in the southeast. The decline in Skylark seems to be driven largely by declines in the western region. Meadow Pipit *Anthus pratensis* showed decline in the southwest only.

Yellowhammer *Emberiza citrinella* has remained stable nationally throughout the Countryside Bird Survey, but showed a decline in its stronghold region, the southeast.

The significant trends presented are largely consistent with those elsewhere in Europe, especially in the UK and western Europe.

CBS is a joint project of BirdWatch Ireland and the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government.



Comhshaoil, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government



Introduction

Up to 1998, the main sources of data on Ireland's terrestrial breeding bird populations have been the two breeding bird atlases, undertaken between 1968 and 1972 (Sharrock 1976) and between 1988 and 1991 (Gibbons *et al.* 1993). While these two surveys provided clear, snapshot comparisons of the distribution of each breeding species over the twenty-year span, little information on abundance was gathered and attempts to quantify population changes were, at best, 'guesstimates.'

However, the atlases did serve to highlight some alarming range

contractions, which in turn had implications for changes in population levels. The decline in distribution of several species which would traditionally have been considered farmland birds coincided with a period of increased agricultural intensification. A relatively recent thorough analysis of bird monitoring data from a variety of European countries (PECBMS 2007) showed that there were massive rates of declines in several farmland breeding bird populations during the 1970s and 1980s. For most species, these trends stabilised during the 1990s, with some beginning to show recovery.

The Countryside Bird Survey (CBS) was initiated in 1998, with the

primary objective of monitoring breeding populations of common and widespread species in the Republic of Ireland. Results for the first three years and eight years were presented in two reports (Coombes *et al.* 2001) and (Coombes *et al.* 2006), respectively.

Now, with a ten-year data set never before available in Ireland, the CBS has reached a significant milestone. Thanks to the involvement of some 500 participants and the co-operation of several bodies, population trends on a wide range of our breeding countryside birds can be presented with greater clarity. This report covers the ten-year period from 1998 to 2007.



Brendan J. Dempsey

Mistle Thrush: Declining.

Methods

The CBS uses a line-transect method. Two bird-recording visits to each survey square per year are undertaken. These visits are timed so that the first is in the early part of the breeding season (April to mid-May) and the second at least four weeks later (from mid-May to 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.

Observers are asked to begin their counts between 06:00 and 07:00 hours to coincide with maximum bird activity, but to avoid concentrated song activity at dawn. Observers are also encouraged to record only adult birds they see or hear as they walk along their transect routes. Bird counts in heavy rain, poor visibility or strong winds are discouraged. Survey work has been undertaken during all seasons since 1998, but was prevented in 2001 by foot-and-mouth restrictions.

Full details on the survey design and production of species indices are presented in Appendix 2.

Population trends were produced for the Republic of Ireland and were also produced at three spatial (regional) levels; the Republic was divided into three regions, based on broad habitat and land management practices (Fig. 2). The western study region includes all coastal counties between Clare



Willow Warbler: Stable. Our commonest summer migrant.

Michael Finn

and Donegal inclusive, and also Roscommon, Longford, Westmeath and Offaly.

The southern study region includes all counties south of the Shannon Estuary (including Counties Limerick and Tipperary) and east to and including Counties Waterford, Kilkenny and Laois.

The eastern study region encompasses all east coast counties between and including Louth and Wexford, and also includes Cavan, Monaghan, Kildare and Carlow.

Colonial nesting species are not adequately monitored using the CBS methodology. Trends for these species, particularly seabirds and some breeding wader species, are not presented here.

The scientific names of all species mentioned in this report are listed in Appendix 1.



Results: coverage

Some 397 squares have been surveyed at least once between 1998 and 2007 (Fig. 1), although the number covered in any one season ranged from 259 in 1998 to 325 in 2000.

Overall, 30% of squares were covered in all years and 74% of squares were covered in at least six out of nine possible survey years (excluding 2001, when no fieldwork was undertaken). Trend analyses were limited to the 392 squares which were surveyed in two or more seasons.

Coverage was greatest in the east and southeast regions, and was moderately high in the northeast. There was close to 100% coverage in the eastern and southeastern regions, while 76% of squares were covered in the northeast region and between 41% and 50% of squares in the remaining five regions (Figs 1 & 2). Nonetheless, the number of squares covered regularly in each region was deemed adequate for meaningful analyses of the population trends of several species, including trends at a regional level.

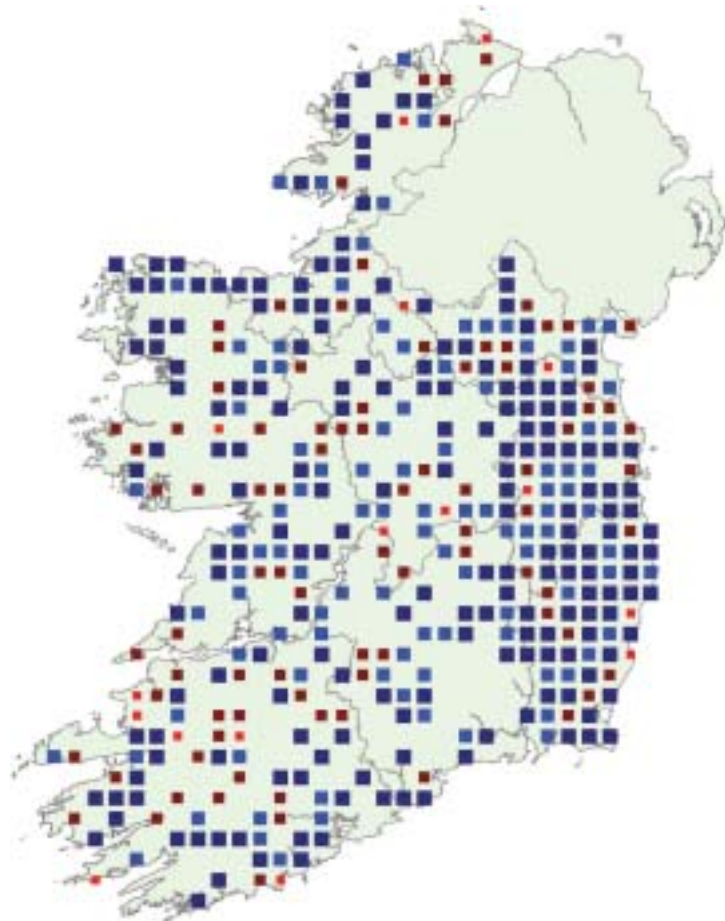
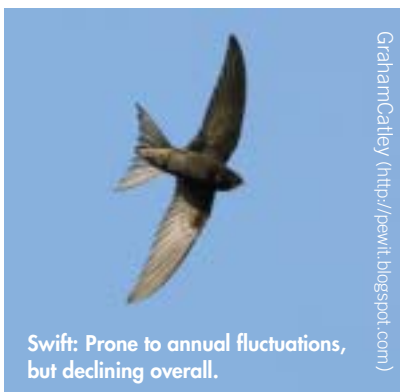


Figure 1. Map showing coverage during the CBS between 1998 and 2007, illustrating the eight sampling regions, also showing the extent of coverage within each (largest, dark blue squares = 8-9 years, lighter blue = 6-7 years, dark red = 3-5 years, red = 1-2 years).

The CBS has been undertaken by a combination of BirdWatch Ireland volunteers and professional staff of the National Parks and Wildlife Service and BirdWatch Ireland. In total, 454 observers have participated, with between 182 and 218 participating in any one season (Fig. 3). Coverage is largely by volunteers, with significant input from staff of the National Parks and Wildlife Service (NPWS), and more recently, input from contract fieldworkers (Figs. 3a & 3b).

With the exception of a large gain of 33% of volunteers between 1998 and 1999, roughly equal proportions of observers have been gained and lost each season. These proportions have declined over time (Fig. 4) to roughly 10% gain and loss between 2006/07. There was a considerable loss in observers between 2000 and 2002, possibly due to the lack of a field season in 2001 because of foot-and-mouth disease.

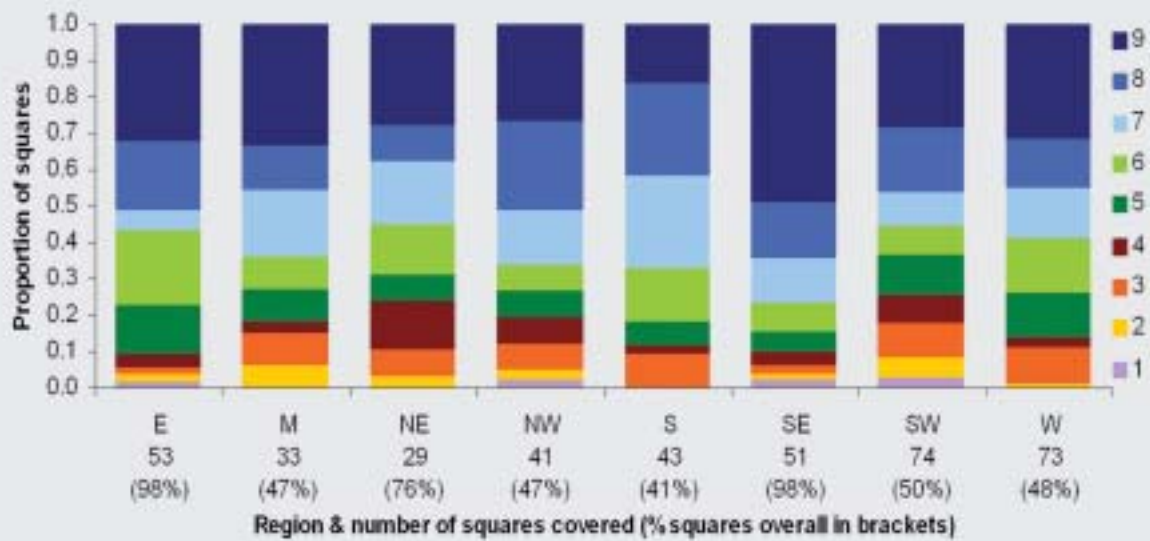


Figure 2. Breakdown of coverage in each region, illustrating the extent of coverage within each (proportion of squares covered in 1, 2, ... 9 years). The number and proportion of overall squares is given on the x-axis legend.

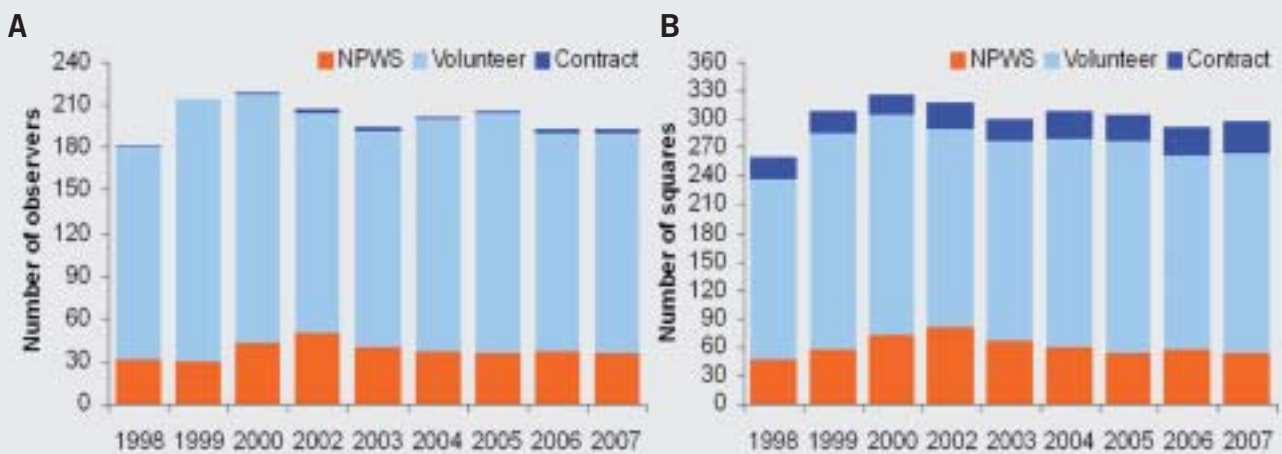


Figure 3. Number of NPWS, volunteer and contract observers (A), and number of squares covered by the respective groups (B) between 1998 and 2007.

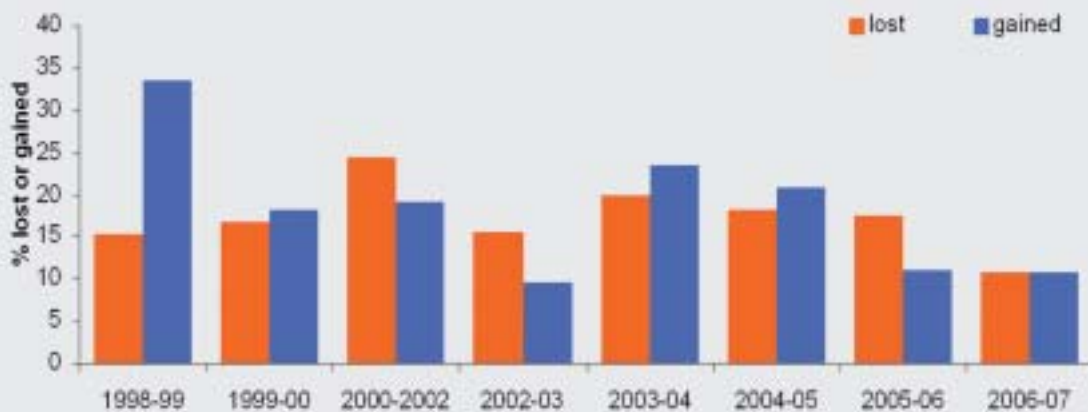


Figure 4. Observer turnover, illustrating the proportion lost and gained from one field season to the next, from 1998 to 2007.



Results: habitats

Habitat was recorded in at least one survey year for all of the 200m sections and squares covered.

Farmland predominated (68% of sections), especially improved and unimproved grassland, followed by peatland (15%) (Table 1). Woodland, semi-natural grassland, human sites and scrub each occupied between 3% and 4% of sections, while relatively few sections were located near waterbodies, along the coast, or in rocky areas.

Table 1. Main habitats reported in 200m sections during the CBS. Mean over all years \pm standard deviation is given.

| Habitat | % composition |
|------------------------|----------------|
| Woodland | 4.6 \pm 0.5 |
| Scrub | 2.9 \pm 0.5 |
| Semi-natural grassland | 3.8 \pm 0.7 |
| Bog/heath | 14.7 \pm 1.6 |
| Farmland | 67.6 \pm 2.0 |
| Human site | 4.1 \pm 0.4 |
| Water | 1.1 \pm 0.2 |
| Coastal | 0.2 \pm 0.1 |
| Rock | 0.8 \pm 0.3 |

Stock Dove: Amber-listed species. Localised distribution, mainly found in arable areas.



John Fox



Michael Finn

Moorhen: widespread but quite secretive.

Results: species

In total, 145 species were recorded between 1998 and 2007, 62 of which were recorded in 20 or more squares. This latter group includes four species which are red-listed and 17 amber-listed in the Birds of Conservation Concern in Ireland (Lynas *et al.* 2007).

Wren, Robin, Blackbird and Chaffinch have remained the most widespread species, and all were recorded in over 90% of squares (Table 2). A further 18 species were present in at least 50% of squares. This list includes two wader and three gull species which are considered to be inadequately monitored using CBS methodology.

The remaining 82 less frequently recorded species included 40 relatively scarce species which were recorded on 10 or less occasions, and 16 species which were recorded once or twice only. These included Greenland White-fronted Goose, Pintail, Shoveler, Common Scoter, Goosander, Red-legged Partridge, Grey Partridge, Quail, Honey Buzzard, Marsh Harrier, Goshawk, Great Northern Diver, Sanderling, Bar-tailed Godwit, Black Guillemot and Wood Warbler. Several of these were winter waterbird migrants recorded during early visits at wetland sites prior to their departure to breeding areas. Goshawk, Grey Partridge, Quail and Wood Warbler are rare, or potentially, breeding species, while others such as Honey Buzzard, and Marsh Harrier are passage migrants.



Michael Finn

Redpoll:
Increasing, as are
several other
seed-eaters.

Among the list of relatively widespread species, abundance ranged between 1.1 and 33.0 birds per square (Table 2) and was highest in Rook, Starling and Wren and lowest in Sparrowhawk, Kestrel and Treecreeper.

Indices were produced for 53 species which occurred in at least 30 squares (Table 3), including one species, Yellowhammer, which is red-listed in the Birds of Conservation Concern in Ireland (Lynas *et al.* 2007), and a further 11 which are amber-listed. Countryside breeding bird species in Ireland fared quite well between 1998 and 2007, with the large majority either stable or increasing over the period; 25 species were shown to increase, nine species

declined, while the remaining 23 species remained relatively stable (Table 3). Pigeons, warblers, tits, finches and buntings fared particularly well, with no species among these groups showing declines.

Greatest increases in trends were seen in Stonechat, Blackcap, Spotted Flycatcher, Goldfinch, Redpoll and Bullfinch, while greatest declines were in Kestrel, Swift, Skylark and Mistle Thrush. Several of the significant trends are illustrated in Figures 5 & 6. Significant declines were also shown for Curlew and Black-headed Gull. However, neither of these species is adequately monitored using CBS methodology. It is interesting to note that several



Table 2. Species recorded in 20 squares or more during the CBS between 1998 and 2007, indicating the mean abundance, mean number and proportion of squares in which each species was recorded.

| Species | | Number per square ¹ | Mean number squares | % squares |
|---------------------------|-----------------------------------|--------------------------------|---------------------|-----------|
| Mute Swan | <i>Cygnus olor</i> | 3.7 | 22 | 7 |
| Mallard | <i>Anas platyrhynchos</i> | 3.6 | 83 | 27 |
| Pheasant | <i>Phasianus colchicus</i> | 3.6 | 229 | 76 |
| Sparrowhawk | <i>Accipiter nisus</i> | 1.1 | 32 | 10 |
| Kestrel | <i>Falco tinnunculus</i> | 1.2 | 40 | 13 |
| Cormorant | <i>Phalacrocorax carbo</i> | 2.6 | 23 | 8 |
| Grey Heron | <i>Ardea cinerea</i> | 1.7 | 65 | 21 |
| Moorhen | <i>Gallinula chloropus</i> | 1.6 | 38 | 13 |
| Snipe* | <i>Gallinago gallinago</i> | 1.9 | 49 | 16 |
| Curlew* | <i>Numenius arquata</i> | 2.7 | 37 | 12 |
| Black-headed Gull* | <i>Chroicocephalus ridibundus</i> | 9.7 | 26 | 9 |
| Lesser Black-backed Gull* | <i>Larus fuscus</i> | 5.6 | 28 | 9 |
| Herring Gull* | <i>Larus argentatus</i> | 8.8 | 38 | 13 |
| Feral Pigeon | <i>Columba livia</i> | 7.3 | 35 | 12 |
| Stock Dove | <i>Columba oenas</i> | 2.9 | 34 | 11 |
| Woodpigeon | <i>Columba palumbus</i> | 13.1 | 265 | 88 |
| Collared Dove | <i>Streptopelia decaocto</i> | 2.5 | 54 | 18 |
| Cuckoo | <i>Cuculus canorus</i> | 1.8 | 75 | 25 |
| Swift | <i>Apus apus</i> | 3.8 | 43 | 14 |
| Skylark | <i>Alauda arvensis</i> | 5.5 | 140 | 46 |
| Sand Martin | <i>Riparia riparia</i> | 9.9 | 28 | 9 |
| Swallow | <i>Hirundo rustica</i> | 12.0 | 264 | 88 |
| House Martin | <i>Delichon urbica</i> | 5.4 | 83 | 28 |
| Meadow Pipit | <i>Anthus pratensis</i> | 9.6 | 189 | 63 |
| Grey Wagtail | <i>Motacilla cinerea</i> | 1.6 | 48 | 16 |
| Pied Wagtail | <i>Motacilla alba</i> | 2.2 | 144 | 48 |
| Wren | <i>Troglodytes troglodytes</i> | 15.1 | 289 | 96 |
| Dunnock | <i>Prunella modularis</i> | 4.3 | 218 | 72 |
| Robin | <i>Erithacus rubecula</i> | 10.8 | 281 | 94 |
| Stonechat | <i>Saxicola torquata</i> | 2.5 | 73 | 24 |
| Wheatear | <i>Oenanthe oenanthe</i> | 2.7 | 33 | 11 |
| Blackbird | <i>Turdus merula</i> | 12.9 | 280 | 93 |
| Song Thrush | <i>Turdus philomelos</i> | 5.6 | 257 | 85 |
| Mistle Thrush | <i>Turdus viscivorus</i> | 2.5 | 137 | 45 |
| Grasshopper Warbler | <i>Locustella naevia</i> | 1.6 | 36 | 12 |
| Sedge Warbler | <i>Acrocephalus schoenobaenus</i> | 3.0 | 63 | 21 |
| Blackcap | <i>Sylvia atricapilla</i> | 2.1 | 68 | 23 |
| Whitethroat | <i>Sylvia communis</i> | 2.2 | 60 | 20 |
| Chiffchaff | <i>Phylloscopus collybita</i> | 2.7 | 116 | 39 |
| Willow Warbler | <i>Phylloscopus trochilus</i> | 6.5 | 204 | 68 |
| Goldcrest | <i>Regulus regulus</i> | 3.5 | 151 | 50 |
| Spotted Flycatcher | <i>Muscicapa striata</i> | 1.6 | 31 | 10 |
| Long-tailed Tit | <i>Aegithalos caudatus</i> | 3.3 | 48 | 16 |
| Blue Tit | <i>Cyanistes caeruleus</i> | 4.7 | 233 | 77 |
| Great Tit | <i>Parus major</i> | 3.3 | 204 | 68 |
| Coal Tit | <i>Pariparus ater</i> | 3.1 | 171 | 57 |
| Treecreeper | <i>Certhia familiaris</i> | 1.5 | 21 | 7 |
| Magpie | <i>Pica pica</i> | 5.4 | 253 | 84 |
| Jackdaw | <i>Corvus monedula</i> | 13.5 | 217 | 72 |
| Rook | <i>Corvus frugilegus</i> | 33.0 | 242 | 81 |
| Hooded Crow | <i>Corvus corone cornix</i> | 4.2 | 231 | 77 |
| Raven | <i>Corvus corax</i> | 2.1 | 70 | 23 |
| Starling | <i>Sturnus vulgaris</i> | 17.7 | 213 | 71 |
| House Sparrow | <i>Passer domesticus</i> | 7.4 | 131 | 43 |
| Chaffinch | <i>Fringilla coelebs</i> | 9.4 | 273 | 91 |
| Greenfinch | <i>Carduelis chloris</i> | 4.7 | 173 | 57 |
| Goldfinch | <i>Carduelis carduelis</i> | 3.2 | 123 | 41 |
| Linnet | <i>Carduelis cannabina</i> | 4.9 | 118 | 39 |
| Redpoll | <i>Carduelis flammea</i> | 3.4 | 48 | 16 |
| Bullfinch | <i>Pyrrhula pyrrhula</i> | 2.4 | 125 | 42 |
| Yellowhammer | <i>Emberiza citrinella</i> | 4.4 | 77 | 26 |
| Reed Bunting | <i>Emberiza schoeniclus</i> | 2.3 | 86 | 29 |

¹ Based on squares where the respective species were present only.

* Waterbird species not adequately monitored through the CBS.

Kestrel: Showing a worrying decline.

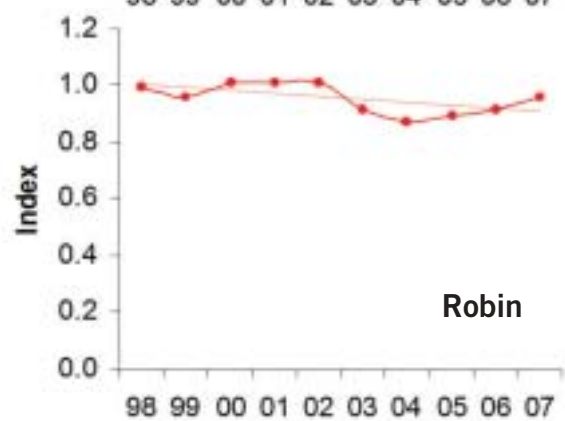
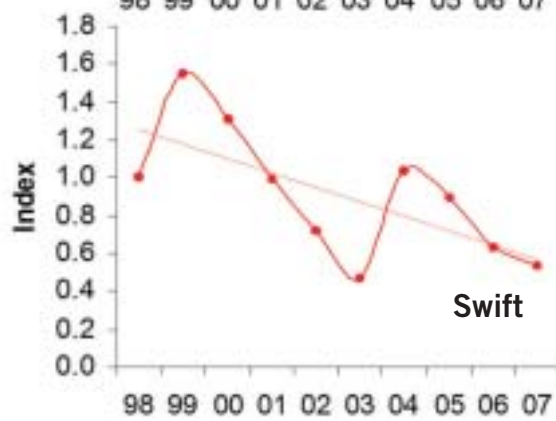
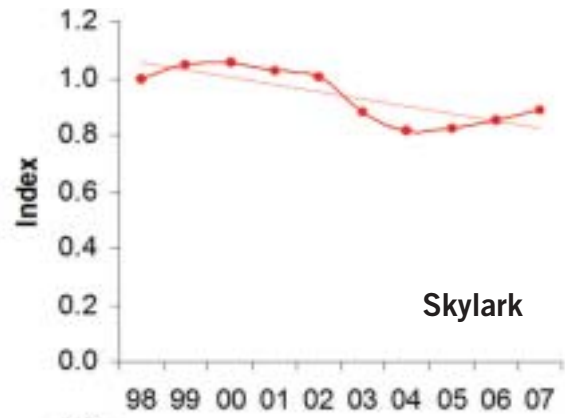
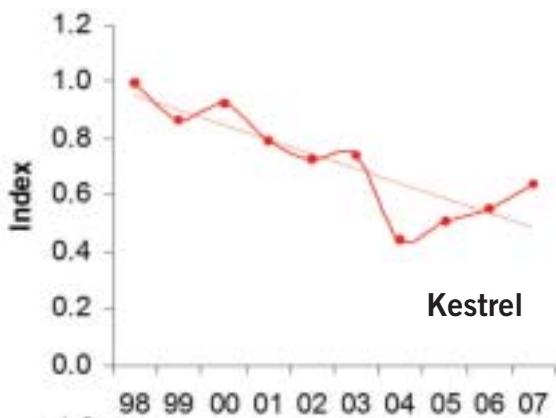


Figure 5. Significant trends shown for a selection of declining species between 1998 and 2007, showing mean annual change (line of best fit).



Table 3. Trends for species at national and at regional level (NE=northeast, E=east, SE=southeast, S=south, SW=southwest, W=west, NW=northwest, M=midland), indicating the annual percentage change together with an indication of significance. ** indicates a strong increase ($p < 0.001$), and * indicates a moderate increase or decline ($p < 0.001$). Blank cells indicate that the regional sample was too small for meaningful analysis.

| Species † | Mean change (%)‡ | E | M | NE | NW | S | SE | SW | W |
|---------------------------------|------------------|-----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Mallard | -1.97 | - | - | - | - | - | - | - | -2.93 |
| Pheasant | 2.86 ** | 4.88 ** | 0.09 | - | - | 3.48 * | 5.82 ** | 1.91 | 5.33 ** |
| Sparrowhawk | 2.36 | - | - | - | - | - | - | - | - |
| Kestrel | -6.89 ** | - | - | - | - | - | - | - | - |
| Grey Heron | -1.94 | - | - | - | - | - | - | - | - |
| Moorhen | -1.05 | - | - | - | - | - | - | - | - |
| Feral Pigeon | 6.49 * | - | - | - | - | - | - | - | - |
| Stock Dove | -0.93 | - | - | - | - | - | - | - | - |
| Woodpigeon | 2.3 ** | 0.29 | 3.03 * | 3.94 ** | 1.14 | 2.32 * | 4.36 ** | 1.83 | 2.25 * |
| Collared Dove | 4.47 * | - | - | - | - | - | - | - | - |
| Cuckoo | 1.78 | - | - | - | - | - | - | - | 2.52 |
| Swift | -8.19 ** | - | - | - | - | - | - | - | - |
| Skylark | -2.67 ** | - | - | - | -2.47 | - | - | -1.08 | -2.18 ** |
| Swallow | -0.09 | -1.92 | -4.14 ** | 0.28 | 0.61 | 1.23 | -0.99 | 2.23 * | -0.23 |
| House Martin | 0.81 | - | - | - | - | - | - | - | - |
| Meadow Pipit | -1.18 * | - | - | - | -0.09 | - | - | -3.38 * | -1.5 |
| Grey Wagtail | 0.3 | - | - | - | - | - | - | - | - |
| Pied Wagtail | -0.22 | -0.09 | - | - | - | - | -0.34 | 6.14 ** | -2.27 |
| Wren | 1.73 ** | 0.91 | 1.99 * | 2.15 * | 2.25 * | 4.44 ** | 0.93 | 0.99 | 0.62 |
| Dunnock | 0.34 | 2.51 * | -2.09 | - | - | -0.54 | 1.29 | -1.46 | -1.25 |
| Robin | -1.08 ** | -0.83 | 0.4 | -1.26 | -2.45 ** | 1.58 * | -2.68 ** | -1.48 * | -2.4 ** |
| Stonechat | 6.32 ** | - | - | - | - | - | - | - | 5.09 * |
| Wheatear | -0.31 | - | - | - | - | - | - | - | - |
| Blackbird | 0.77 * | 1.78 ** | 2.36 * | 1.93 * | -1.23 | 1.56 | 0.2 | 0.02 | 0.04 |
| Song Thrush | 0.55 | 0.64 | 1.42 | 5.16 ** | 1.73 | 0.4 | -2.04 * | -0.58 | -0.16 |
| Mistle Thrush | -3.3 ** | -3.42 | - | - | - | - | -6.19 ** | - | - |
| Grasshopper Warbler | 4.12 * | - | - | - | - | - | - | - | - |
| Sedge Warbler | 2.99 * | - | - | - | - | - | - | - | - |
| Blackcap | 16.08 ** | - | - | - | - | - | - | - | - |
| Whitethroat | 3.48 * | - | - | - | - | - | - | - | - |
| Chiffchaff | -0.77 | - | - | - | - | - | - | 0.4 | - |
| Willow Warbler | 3.2 ** | 1.28 | 4.87 ** | - | 2.58 | 5.08 * | 2.09 | 1.38 | 3.03 ** |
| Goldcrest | 2.63 ** | 5.14 ** | - | - | - | - | 2.17 | -1.99 | - |
| Spotted Flycatcher | 7.75 ** | - | - | - | - | - | - | - | - |
| Long-tailed Tit | 1.29 | - | - | - | - | - | - | - | - |
| Blue Tit | 1.57 ** | 1.96 | -0.53 | - | - | 0.93 | -0.37 | 5.36 ** | -1.55 |
| Great Tit | 2.77 ** | 5.37 ** | - | - | - | 3.38 | 4.93 ** | 4.32 ** | -0.46 |
| Coal Tit | 2.09 ** | 6.45 ** | - | - | - | 1.95 | 0.9 | 1.5 | 0.91 |
| Magpie | -1.41 ** | 0.34 | -4.12 ** | - | - | 0.63 | 2.45 * | -0.84 | -3.98 ** |
| Jackdaw | 2.26 ** | 3.05 * | 0.23 | - | - | 5.31 ** | -0.22 | -1.39 | 1.46 |
| Rook | -3.51 ** | -6.27 ** | -1.79 | - | - | 1.94 | -3.66 | -4.29 ** | -8.2 ** |
| Hooded Crow | 1.12 | 4.12 * | -3.4 * | - | 5.74 * | 5.59 ** | -0.25 | 1.4 | -2.05 |
| Raven | -0.66 | - | - | - | - | - | - | - | - |
| Starling | 0.76 | 4.94 ** | -4.91 * | - | - | 1.31 | -4.59 * | 0.64 | 4.04 * |
| House Sparrow | 3.38 ** | 5.16 ** | - | - | - | - | 0.79 | - | - |
| Chaffinch | 1.04 ** | 1.36 | 1.89 * | 4.57 ** | 3.33 * | 0.89 | -1.18 | 0.34 | -0.71 |
| Greenfinch | -0.7 | 3.63 * | - | - | - | -4.43 * | -4.91 ** | -1.19 | 0.52 |
| Goldfinch | 9.87 ** | 10.97 ** | - | - | - | - | 2.84 | - | - |
| Linnet | 1.88 | -2.75 | - | - | - | - | - | -2.31 | 9.1 ** |
| Redpoll | 12.72 ** | - | - | - | - | - | - | - | - |
| Bullfinch | 6.66 ** | 11.13 ** | - | - | - | - | - | 6.02 ** | - |
| Yellowhammer | -0.24 | - | - | - | - | - | -2.67 * | - | - |
| Reed Bunting | 3.04 * | - | - | - | - | - | - | - | - |
| Total declining species | 8 | 1 | 4 | 0 | 1 | 1 | 6 | 3 | 4 |
| Total increasing species | 24 | 13 | 5 | 5 | 3 | 7 | 4 | 5 | 6 |
| Total stable | 21 | 12 | 7 | 2 | 7 | 11 | 14 | 18 | 16 |

† Species listed as Amber and Red in the Birds of Conservation Concern in Ireland (Lynas *et al.* 2007) are shown in colours.

‡ Percentage change overall based on the line of best fit (annual change).

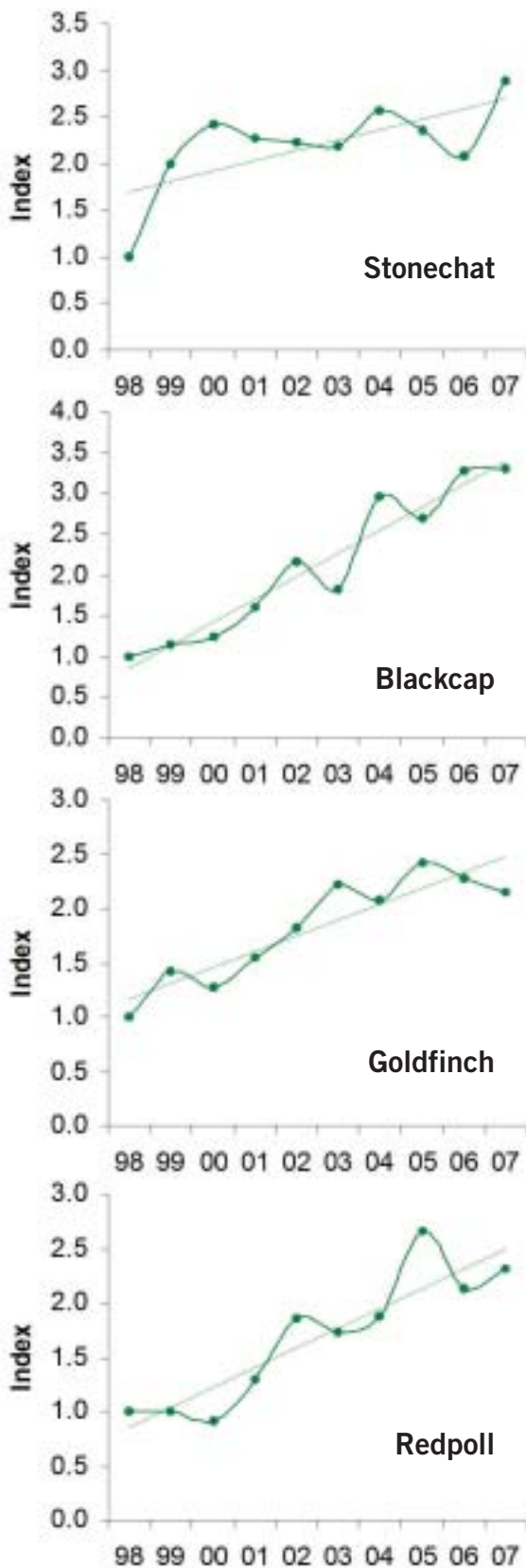


Figure 6. Significant trends shown for a selection of increasing species between 1998 and 2007, showing mean annual change (line of best fit).

of the species showing increasing and declining trends in numbers have also shown increases and declines in range respectively. In particular, there have been increases in the proportion of squares supporting Stonechat, Willow Warbler, Blackcap, Goldcrest, Goldfinch and Bullfinch over the 10-year period, while there were declines in Kestrel, Skylark, Swift and Rook.

Most of the national trends shown were consistent across all sampling regions, especially for Robin (which declined in five regions), Woodpigeon (which increased in five regions) and Pheasant (which increased in four regions) (Table 3). Notable exceptions included Swallow, which increased in the southwest and declined in the midlands, and Song Thrush, which increased in the northeast and declined in the southeast. The decline in Skylark seems to be driven largely by declines in the western region; this species was relatively stable in the northwest and southwest. Meadow Pipit showed decline in the southwest only. Yellowhammer has remained stable nationally throughout the CBS, but showed a decline in its stronghold region, the southeast.



Discussion

Skylark: Declining. Breeding largely confined to upland and bog areas.



Michael Finn

The population trends of almost 60 bird species can now be adequately monitored through the CBS, with the current level of volunteer and NPWS commitment. This includes several species which are of conservation concern in Ireland (Lynas *et al.* 2007), including Yellowhammer, which is red-listed because of a significant decline in population (>50% in 25 years) and range (>70% in 25 years), and a further 15 species which are amber-listed, largely on the basis that they are species of European Conservation Concern. Most species listed as of conservation concern in Ireland have remained stable or shown increasing trends during the CBS.

This work has shown that terrestrial breeding bird populations have generally fared well over the past 10 years. The massive rates of declines in breeding bird populations witnessed throughout several European countries during the 1970s and 1980s (PECBMS 2007) appear to have abated for most species. Several species have shown increasing trends over the past 10 years, which may be attributed to some extent to milder winters in recent decades; it is known that cold winters impact significantly on small birds (Peach *et al.* 1995).

It is pleasing to see that more recent declines have been relatively few, and were well outnumbered by species with

increasing trends. Generally, birds fared better in the east and south of the country, with greatest numbers of declining species in the west, northwest and midlands regions. Some notable examples of species from a variety of habitat types which have shown increasing trends together with a possible increase in range include Stonechat, Willow Warbler, Blackcap, Goldcrest, Goldfinch and Bullfinch.

However, some species continue to show declines in Ireland, and there are several examples where these declines persist in other parts of Europe. Most of these are thought to be caused by changes in agricultural practice. The declines in Kestrel, Skylark and Mistle Thrush are consistent throughout the UK and western Europe (BirdLife International 2004, PECBMS 2007, Risely *et al.* 2008). Meadow Pipit is also declining in Europe and in the UK (BirdLife International 2004, Risely *et al.* 2008), although it has been increasing in Northern Ireland.

The decline in Robin, which has been consistent throughout the CBS (Coombes *et al.* 2002, 2006), is perhaps a little surprising, as this species is stable or increasing throughout Europe (BirdLife International 2004). Also, with the exception of Mistle Thrush mentioned above, other species with similar habits to the Robin, such as the chats and thrushes, have remained stable or increased in Ireland and throughout Europe. The decline in Rook in Ireland,



Pádraig Kavanagh

Goldfinch:
Steadily increasing.

also reported previously (Coombes *et al.* 2006), has persisted over the longer 10-year period and may also be attributed to agricultural change. This species is difficult to adequately monitor through the CBS, as it is highly congregatory, and extremely high counts in excess of 200 birds, which later in the season undoubtedly include some proportion of juveniles, are not uncommon.

However, Rook has also shown a decline in prevalence throughout the CBS. Rook is stable in the UK and Europe, although it has shown decline in France (BirdLife International 2004).

Other declines shown which are less likely to be at least solely attributed to changes in agriculture

include a sub-Saharan migrant – Swift; declines in this group of birds have been attributed to rainfall patterns (which affect their over-winter food supply) in the Sahel (Robinson *et al.* 2008). However, it is possible that increased use of pesticides in western Europe over the past 40 years has also reduced the food supply of these aerial insectivores during the breeding season.

Furthermore, it is likely that nest site availability of most of these species is reduced. Swifts nest almost exclusively in old buildings, and conversion of older buildings and the use of modern materials in this operation often result in the loss of appropriate swift nest sites.

Swallow and House Martins nest in the eaves of houses, and are affected by building refurbishment. The decline in Magpie, especially in the west and midlands regions, is less easy to explain. This species has shown some decline in Europe, but remains stable in the UK and is increasing in Northern Ireland.

It is encouraging that most species have increased or remained stable in Ireland during the past ten years. Continued monitoring of the trends of our common and widespread breeding bird population through the CBS will allow us to track how breeding bird populations respond to some of the changes mentioned above.

Wren: Our most widespread bird, recorded in almost every CBS square.



Michael Finn



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Stonechat: Doing well, probably due to recent mild winters.



Michael Finn



Appendix 1 – List of all bird species occurring during the CBS

| | | | |
|-------------------------------|-------------------------------------|---------------------|-------------------------------------|
| Mute Swan | <i>Cygnus olor</i> | Black Guillemot | <i>Cephus grylle</i> |
| Whooper Swan | <i>Cygnus cygnus</i> | Rock Dove | <i>Columba livia</i> |
| Greenland White-fronted Goose | <i>Anser albifrons flavirostris</i> | Feral Pigeon | <i>Columba livia</i> |
| Greylag Goose | <i>Anser anser</i> | Stock Dove | <i>Columba oenas</i> |
| Canada Goose | <i>Branta canadensis</i> | Woodpigeon | <i>Columba palumbus</i> |
| Shelduck | <i>Tadorna tadorna</i> | Collared Dove | <i>Streptopelia decaocto</i> |
| Wigeon | <i>Anas penelope</i> | Turtle Dove | <i>Streptopelia turtur</i> |
| Teal | <i>Anas crecca</i> | Cuckoo | <i>Cuculus canorus</i> |
| Mallard | <i>Anas platyrhynchos</i> | Barn Owl | <i>Tyto alba</i> |
| Pintail | <i>Anas acuta</i> | Long-eared Owl | <i>Asio otus</i> |
| Shoveler | <i>Anas clypeata</i> | Short-eared Owl | <i>Asio flammeus</i> |
| Tufted Duck | <i>Aythya fuligula</i> | Swift | <i>Apus apus</i> |
| Common Scoter | <i>Melanitta nigra</i> | Kingfisher | <i>Alcedo atthis</i> |
| Red-breasted Merganser | <i>Mergus serrator</i> | Skylark | <i>Alauda arvensis</i> |
| Goosander | <i>Mergus merganser</i> | Sand Martin | <i>Riparia riparia</i> |
| Red Grouse | <i>Lagopus lagopus scoticus</i> | Swallow | <i>Hirundo rustica</i> |
| Red-legged Partridge | <i>Alectoris rufa</i> | House Martin | <i>Delichon urbica</i> |
| Grey Partridge | <i>Perdix perdix</i> | Meadow Pipit | <i>Anthus pratensis</i> |
| Quail | <i>Coturnix coturnix</i> | Rock Pipit | <i>Anthus spinoletta littoralis</i> |
| Pheasant | <i>Phasianus colchicus</i> | Grey Wagtail | <i>Motacilla cinerea</i> |
| Honey Buzzard | <i>Pernis apivorus</i> | Pied Wagtail | <i>Motacilla alba</i> |
| Marsh Harrier | <i>Circus aeruginosus</i> | Dipper | <i>Cinclus cinclus</i> |
| Hen Harrier | <i>Circus cyaneus</i> | Wren | <i>Troglodytes troglodytes</i> |
| Goshawk | <i>Accipiter gentilis</i> | Dunnock | <i>Prunella modularis</i> |
| Sparrowhawk | <i>Accipiter nisus</i> | Robin | <i>Erithacus rubecula</i> |
| Buzzard | <i>Buteo buteo</i> | Whinchat | <i>Saxicola rubetra</i> |
| Kestrel | <i>Falco tinnunculus</i> | Stonechat | <i>Saxicola torquata</i> |
| Merlin | <i>Falco columbarius</i> | Wheatear | <i>Oenanthe oenanthe</i> |
| Peregrine | <i>Falco peregrinus</i> | Ring Ouzel | <i>Turdus torquatus</i> |
| Red-throated Diver | <i>Gavia stellata</i> | Blackbird | <i>Turdus merula</i> |
| Great Northern Diver | <i>Gavia immer</i> | Fieldfare | <i>Turdus pilaris</i> |
| Great Crested Grebe | <i>Podiceps cristatus</i> | Song Thrush | <i>Turdus philomelos</i> |
| Little Grebe | <i>Tachybaptus ruficollis</i> | Redwing | <i>Turdus iliacus</i> |
| Fulmar | <i>Fulmarus glacialis</i> | Mistle Thrush | <i>Turdus viscivorus</i> |
| Manx Shearwater | <i>Puffinus puffinus</i> | Grasshopper Warbler | <i>Locustella naevia</i> |
| Gannet | <i>Sula bassana</i> | Sedge Warbler | <i>Acrocephalus schoenobaenus</i> |
| Cormorant | <i>Phalacrocorax carbo</i> | Reed Warbler | <i>Acrocephalus scirpaceus</i> |
| Shag | <i>Phalacrocorax aristotelis</i> | Blackcap | <i>Sylvia atricapilla</i> |
| Grey Heron | <i>Ardea cinerea</i> | Garden Warbler | <i>Sylvia borin</i> |
| Little Egret | <i>Egretta garzetta</i> | Whitethroat | <i>Sylvia communis</i> |
| Water Rail | <i>Rallus aquaticus</i> | Wood Warbler | <i>Phylloscopus sibilatrix</i> |
| Corncrake | <i>Crex crex</i> | Chiffchaff | <i>Phylloscopus collybita</i> |
| Moorhen | <i>Gallinula chloropus</i> | Willow Warbler | <i>Phylloscopus trochilus</i> |
| Coot | <i>Fulica atra</i> | Goldcrest | <i>Regulus regulus</i> |
| Oystercatcher | <i>Haematopus ostralegus</i> | Spotted Flycatcher | <i>Muscicapa striata</i> |
| Ringed Plover | <i>Charadrius hiaticula</i> | Long-tailed Tit | <i>Aegithalus caudatus</i> |
| Golden Plover | <i>Pluvialis apricaria</i> | Blue Tit | <i>Cyanistes caeruleus</i> |
| Lapwing | <i>Vanellus vanellus</i> | Great Tit | <i>Parus major</i> |
| Sanderling | <i>Calidris alba</i> | Coal Tit | <i>Periparus ater</i> |
| Dunlin | <i>Calidris alpina</i> | Treecreeper | <i>Certhia familiaris</i> |
| Jack Snipe | <i>Lymnocyptes minimus</i> | Jay | <i>Garrulus glandarius</i> |
| Snipe | <i>Gallinago gallinago</i> | Magpie | <i>Pica pica</i> |
| Woodcock | <i>Scolopax rusticola</i> | Chough | <i>Pyrrhocorax pyrrhocorax</i> |
| Black-tailed Godwit | <i>Limosa limosa</i> | Jackdaw | <i>Corvus monedula</i> |
| Bar-tailed Godwit | <i>Limosa lapponica</i> | Rook | <i>Corvus frugilegus</i> |
| Whimbrel | <i>Numenius phaeopus</i> | Hooded Crow | <i>Corvus corone cornix</i> |
| Curlew | <i>Numenius arquata</i> | Raven | <i>Corvus corax</i> |
| Redshank | <i>Tringa totanus</i> | Starling | <i>Sturnus vulgaris</i> |
| Greenshank | <i>Tringa nebularia</i> | House Sparrow | <i>Passer domesticus</i> |
| Common Sandpiper | <i>Actitis hypoleucos</i> | Tree Sparrow | <i>Passer montanus</i> |
| Turnstone | <i>Arenaria interpres</i> | Chaffinch | <i>Fringilla coelebs</i> |
| Great Skua | <i>Stercorarius skua</i> | Brambling | <i>Fringilla montifringilla</i> |
| Black-headed Gull | <i>Chroicocephalus ridibundus</i> | Greenfinch | <i>Carduelis chloris</i> |
| Common Gull | <i>Larus canus</i> | Goldfinch | <i>Carduelis carduelis</i> |
| Lesser Black-backed Gull | <i>Larus fuscus</i> | Siskin | <i>Carduelis spinus</i> |
| Herring Gull | <i>Larus argentatus</i> | Linnet | <i>Carduelis cannabina</i> |
| Great Black-backed Gull | <i>Larus marinus</i> | Twite | <i>Carduelis flavirostris</i> |
| Kittiwake | <i>Rissa tridactyla</i> | Redpoll | <i>Carduelis flammea</i> |
| Sandwich Tern | <i>Sterna sandvicensis</i> | Crossbill | <i>Loxia curvirostra</i> |
| Common Tern | <i>Sterna hirundo</i> | Bullfinch | <i>Pyrrhula pyrrhula</i> |
| Arctic Tern | <i>Sterna paradisaea</i> | Yellowhammer | <i>Emberiza citrinella</i> |
| Guillemot | <i>Uria aalge</i> | Reed Bunting | <i>Emberiza schoeniclus</i> |
| Razorbill | <i>Alca torda</i> | | |

Appendix 2 – Survey design, field methods & analyses

Yellowhammer: Holding its own, but declining in its stronghold, the southeast.



Billy Clarke

The CBS is based on a random stratified approach. The Republic was divided into eight regions, and 10 km squares (based on the Irish National Grid) were randomly selected within each, and allocated in sequence. For each 10 km square selected, the 1 km square at the extreme southwest corner is surveyed. Those with less than 50% land, e.g. coastal areas or lake shores, have been excluded, leaving some 700 possible survey squares. The survey aims to achieve coverage of the same 1 km squares each year, ideally by the same observer, although there is likely to be some change-over of survey participants.

The ideal survey route within each 1 km square comprises two parallel lines, each 1 km in length, about 500 m apart and about 250 m from the edge of the square. For practical reasons there is often deviation from the ideal route. Each 1 km transect is

divided into five 200 m sections, at which level all information is collected.

Three visits to each survey square per year are undertaken. During a reconnaissance visit, the transect routes are planned and habitat information recorded. Habitat data are recorded using codes from an established hierarchical system common to a range of bird surveys in the UK (Crick 1992). Bird counts are undertaken on the second and third visits.

The total numbers of adult birds of each species detected in each 1 km square were calculated for each year. The maximum of the two counts (from early and late visits) was used as the annual measure of relative abundance for each species. Annual population indices were calculated using TRIM (Trends & Indices for Monitoring Data), a program used for the analysis of time series of counts with missing

observations (Pannekoek & van Strien 1996). Counts are modelled as a function of square (site) and year effects, with interpolated estimates for site-year combinations with missing data. The stratified sampling design results in unequal representation of regions across Ireland, so annual counts were weighted by the inverse of the proportion of the area of each region that was surveyed that year. Population trends for species occurring on a mean of 30 or more squares over the duration of the survey were estimated by examining the overall rate of annual change, as caution is urged because of the low precision associated with sample sizes smaller than 30 (Joys *et al.* 2003).

Population change is usually displayed in the form of indices, where the results from one season are set to some arbitrary figure, usually 1 or 100, and index values are calculated for all other seasons according to how each relates to the base season. A constant rate of decline is exponential when illustrated. For example, if a population is declining by 50% each year, then if the initial index is 1, the index at timepoint 2 is 0.5, and at timepoint 3 is 0.25. If the population doubles each year, the index values for the respective timepoints are 2, 4 and 8. Index values are thus measures of relative abundance for a species, and usually the relationship between this and the absolute abundance is unknown.

The mean annual change was estimated by fitting a regression line through the data. Trends were calculated across all habitats. Trends were also produced for a number of bird groups (defined by species of similar habits and habitats) by calculating the geometric means of the annual indices of the respective species.



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