

## IS IT POSSIBLE TO USE YEAR ON YEAR RINGING DATA TO MONITOR BIRD POPULATIONS?

It has long been thought that the only way to monitor populations through ringing is by using standardised techniques with the same footage of nets in the same places for the same period of time over a given number of sessions in summer. This paper suggests that for long term ringing sites using the numbers ringed per annum can yield some data that, it is suggested, is sufficiently robust to give a reliable indication of population trends in much the same way as CES ringing.

### Introduction

The Wicken Fen Group has been ringing birds at Wicken Fen since 1968. In 1969 the Group began what were called standard sites sessions – the forerunner of CES – when a protocol of consistent net lengths and siting, in a variety of Fen habitats with consistent hours worked was established in an attempt to provide a controlled measure of populations. The aim was to compare the Relative Abundance values year on year which would indicate changes in the populations of those species regularly caught. The results of this work were published at the time. Unfortunately, the ambition of the scheme outstripped the Group's manpower and capacity to deliver it and within ten years the standard sites sessions had to be re-designed to a more modest level of activity and in a single habitat where, with an ever declining number of birds caught, the data became harder to interpret.

Throughout the period 1969 to present, apart from four standardised sessions each summer the Group has largely been ringing birds in a scientifically random way that is characteristic of most ringing operations. In general (exceptions below) this has been without targeting certain species, or using lures, until relatively recently.

Given this continuous operation it seemed to be worthwhile to ask the question whether a comparison of the number of ringed birds each year against the number ringed in 1969 could yield information on trends in populations.

## Methods

To look at the trends in populations of selected species the annual Relative Abundance (RA) was calculated using the number of birds ringed 1969-2009. The figures were calculated by dividing the numbers of say Wren in 2001 by the total number of birds ringed in 2001. The RA figures are in the two tables below, the first table is 1969-89 and the second 1990-09. Only those species that have been caught without any specific luring or directed catching attempts have been included. Using these data shows overall population and not just breeding population, adults and juveniles. For some species straight numbers are included in an attempt to show consistency, or the extent of decline.

## Exclusions

Catches for hirundines (Sand Martin, Swallow and House Martin) were excluded in certain years when their total exceeded 25 because they were at times specific targets and the numbers caught sometimes severely loaded the overall total (in 1973 over 800 hirundines were ringed out of a total of 2198 birds).

*Acrocephalus* (Reed & Sedge) warbler catches have varied over time, (53-1000+) due to the proportion of time spent catching at the reedbed. This inconsistency meant that they could not be included in the analysis.

Out of breeding season feeding, begun in winter 2003 undoubtedly drew in many birds and thus species that could be thought to be drawn in by feeders has not been considered (great tit, blue tit, chaffinch, sparrow and bunting spp).

## RESULT

	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
<b>Total ringed (thousands)</b>	<b>0.8</b>	<b>3.2</b>	<b>3.5</b>	<b>2.8</b>	<b>4.8</b>	<b>3.1</b>	<b>2.0</b>	<b>2.6</b>	<b>1.9</b>	<b>1.6</b>	<b>1.8</b>	<b>2.1</b>	<b>1.6</b>	<b>1.3</b>	<b>2.2</b>	<b>3.1</b>	<b>1.8</b>	<b>1.6</b>	<b>1.7</b>	<b>1.5</b>	<b>1.1</b>
Wren	3.9	3.2	3.3	4.7	4.2	4.2	4.4	2.5	4.2	4.2	3.8	4.9	5.6	5.7	6.8	6.7	6.0	5.4	6.3	10.7	9.6
Dunnock	7.5	5.0	5.3	5.6	6.0	6.5	6.0	4.8	4.0	4.8	3.0	5.1	6.3	2.9	4.3	5.1	3.2	5.3	3.6	4.9	5.0
Robin	3.1	3.1	3.1	2.1	3.2	2.7	1.9	3.2	3.0	3.0	3.8	4.2	4.7	3.7	3.5	3.4	4.1	4.6	4.3	5.3	5.8
Blackbird	7.3	3.8	3.9	3.3	3.5	2.4	3.5	3.2	5.5	4.9	4.5	7.3	12.3	7.7	9.4	8.5	7.4	7.5	6.1	5.3	6.5
Song Thrush	7.1	4.0	7.7	6.6	5.3	3.6	5.3	4.1	6.1	5.1	4.3	6.3	6.6	5.4	6.8	5.0	5.4	4.9	3.7	4.7	3.6
Lesser Whitethroat	0.5	0.9	1.2	0.7	0.7	0.9	1.6	1.2	0.6	1.1	0.6	0.3	1.0	0.6	0.7	1.0	0.7	1.5	1.8	0.9	1.5
Whitethroat (2.6)	0.7	1.3	0.8	0.6	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.1	0.2	0.1	0.2	1.1	0.2	0.3	0.3	1.2
Garden Warbler	8	20	15	13	28	8	8	11	5	4	5	10	10	13	10	36	20	34	25	18	8
Blackcap	2.1	2.2	3.5	4.0	3.2	1.9	2.5	2.2	3.3	2.7	2.7	3.8	3.7	8.4	4.9	4.7	4.7	8.2	6.2	4.9	4.6
Chiffchaff	0.9	1.9	1.9	1.0	0.6	0.8	0.5	0.7	0.7	0.5	1.2	0.7	0.9	1.6	0.7	0.6	0.7	2.5	2.6	3.2	2.4
Willow Warbler	6.1	5.2	5.8	3.3	2.2	2.9	2.4	1.7	4.1	2.9	2.8	2.1	2.1	6.2	4.6	4.0	6.3	8.2	7.3	9.3	5.7
Spotted Flycatcher	11	16	18	21	23	29	12	9	10	9	9	21	4	6	14	20	16	13	13	6	0
Willow Tit	39	38	22	11	25	19	7	15	9	8	8	19	10	4	5	0	14	12	15	7	3
Tree Creeper	7	7	14	5	10	5	3	10	5	5	6	14	12	12	15	23	1	11	11	7	5
Bullfinch	7.6	3.8	6.6	7.0	4.8	5.2	7.2	5.7	6.6	7.0	3.8	4.5	4.9	4.5	5.4	6.6	4.8	4.9	5.7	1.8	4.2

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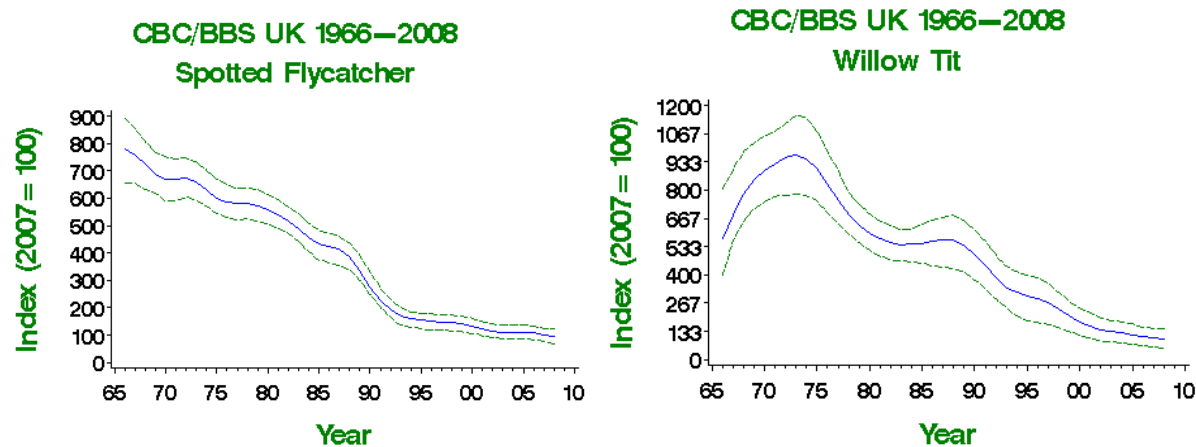
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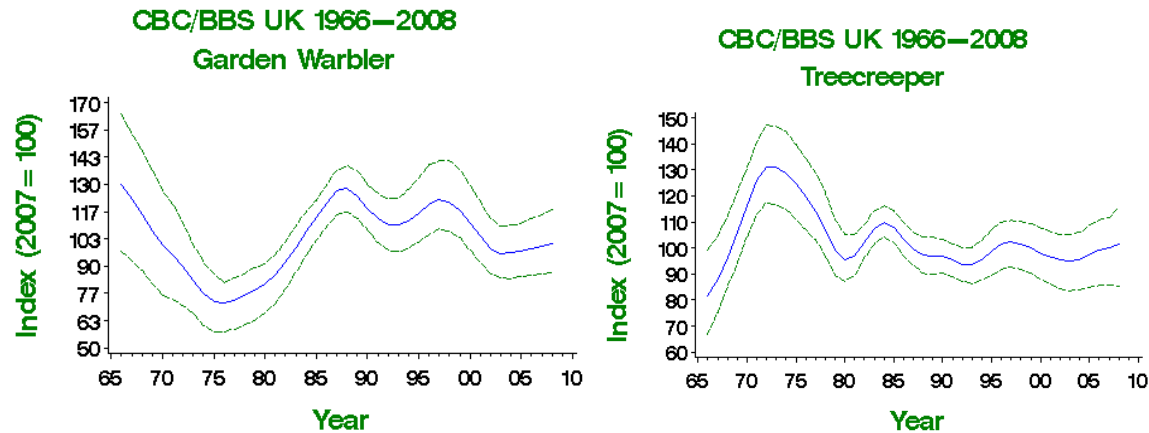
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
Ringed (thousands)	1.2	0.9	1.1	1.2	0.9	1.0	1.0	1.4	1.2	1.2	1.1	0.8	1.7	2.0	1.9	2.9	3.3	4.4	2.9	4.3
Wren	9.5	6.5	5.3	8.3	7.4	6.7	7.2	4.7	7.1	7.9	7.3	8.5	6.1	4.7	3.8	3.7	3.3	5.1	4.6	4.4
Dunnock	4.3	5.9	3.1	3.1	3.9	3.2	3.4	2.0	2.2	2.9	2.5	3.3	2.6	1.9	1.5	1.3	1.3	1.9	1.9	3.0
Robin	7.4	6.4	5.5	5.9	4.7	4.6	6.1	5.0	5.8	7.2	5.7	6.1	5.5	4.4	3.3	3.2	3.4	4.1	3.6	4.2
Blackbird	10.1	8.7	6.5	4.9	4.5	2.9	3.8	5.6	4.5	5.8	4.1	6.0	6.1	3.4	3.6	3.0	4.0	6.4	4.5	4.7
Song Thrush	4.1	1.7	1.1	1.4	0.5	0.9	0.6	1.0	1.0	0.9	1.2	1.8	1.3	0.8	1.1	1.0	1.3	2.0	1.7	2.0
Lesser Whitethroat	1.0	2.2	1.2	1.9	0.7	1.3	1.0	0.6	0.4	0.3	1.0	1.0	0.6	0.4	0.3	1.0	0.4	0.6	0.8	0.4
Whitethroat	1.7	0.7	1.1	1.1	1.3	1.5	3.3	1.6	0.6	0.6	1.7	1.8	1.7	2.7	1.4	0.8	1.2	1.3	1.0	1.9
Garden Warbler	24	11	30	25	21	9	33	23	21	9	20	20	19	26	11	22	24	39	21	43
Blackcap	5.7	6.7	6.6	7.3	6.4	5.0	5.1	6.3	10.1	6.0	6.5	5.5	9.0	3.8	4.1	4.6	4.7	7.3	6.1	7.1
Chiffchaff	4.4	4.8	3.8	2.4	3.1	4.7	5.9	5.1	7.2	2.4	2.5	2.4	4.4	3.4	3.8	3.2	2.7	3.5	5.4	4.1
Willow Warbler	6.6	6.8	6.1	6.5	7.0	4.6	12.4	8.3	11.7	5.9	4.5	3.3	2.3	2.1	1.2	0.9	1.4	1.5	2.0	1.0
Spotted Flycatcher	1	8	0	1	1	1	3	0	1	0	0	0	0	0	0	0	0	3	0	0
Willow Tit	6	6	1	4	3	7	15	6	5	0	0	0	0	0	0	0	0	0	0	0
Tree Creeper	8	3	5	12	7	2	1	1	9	1	1	6	12	5	10	11	12	18	9	19
Bullfinch	3.5	5.8	3.9	2.8	1.5	2.3	2.8	3.3	2.2	4.1	4.6	2.8	2.9	2.3	2.1	1.8	2.7	2.2	2.4	2.1

## Species with straight numbers

For a small group of species I have put in the raw numbers. In Spotted Flyc and Willow Tit to show the scale of decline, or in the case of Garden Warbler, Tree Creeper year on year. These look like 1-4 pairs and their progeny in the case of the Garwa and 1-2 pairs and their progeny in the case of Treec but please read note below.

I don't think that these results show anything startlingly different from trends established by the BTO surveys, on the contrary it is possible to see the BTO trends reflected in our figures (examples below).





## DISCUSSION

One problem with this sort of analysis is that increased catches of one species can skew the figures downward for all other species. Catching in flocks or roosts can have this effect (swallows for example).

Probably the greatest objection to using these data is the inconsistency of activity. As any bird ringer will recognise, individuals vary in their preferences and commitment and, in group ringing especially, individuals come and go so that activity can vary considerably not only from year to year but particularly from era to era. To some extent this is reflected in the overall totals of birds ringed per annum which at Wicken goes from a low point of 0.8k to a high point of 4.8k. However, given a consistency of randomness of ringing these fluctuations in numbers ringed each year should not affect the proportion of each species in the catch unless there is a real change in the population of that species and that appears to be the case.

At Wicken there have been a number of changes in personnel, areas (habitats) used preferentially, and effort, yet despite all those inconsistencies the data suggest that a trend, that we can presume to be real since it matches BTO IPMR trends, emerges using relatively unsophisticated analyses.

It may be that the inconsistencies are ironed out by the volume of birds ringed and this sort of analysis may not be possible for smaller annual totals at more discrete sites.

## CONCLUSION

Using a long term databank resulting from bird ringing, mostly carried out at random, despite the yearly variations in success and effort, trends emerge that mirror the trends from the BTO integrated population monitoring scheme.

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## POPULATION ESTIMATES AND MIST NETTING: AN INTERIM REPORT

### Introduction

This note describes the result of an attempt made in 1970 to sample the bird populations in different habitats by means of mist netting. The areas concerned are not wholly suited to mapping census work, because of the very dense vegetation; mapping has not however been attempted. During three weekends (May 16th-17th, July 4th-5th, and August 1st-2nd), netting was carried out simultaneously at five different sites, which are described below. The nets were placed in the same sites each time, in order to make the programme reproducible in subsequent years. Two hundred feet of net were used on all sites except B (300 ft) from Friday evening to Sunday morning. To consider the catching effort to be the same on all sites is probably erroneous however as the net sites vary in their conspicuousness and susceptibility to wind. It is hoped that the numbers of each species caught are closely related to their number in the area with the exception of all non-passerines and corvids, which are unlikely to be caught as they do not move in thick vegetation.

Tables 1 and 2 show the total numbers of captures of each species on the five sites. Adults and juveniles are separated. The five sites are briefly described below, and some of the more obvious differences in the bird

### The Sites

A1 is the old brick pits in the NE corner of the Fen. Deep water, with a sturdy growth of reeds on the borders is surrounded by willow and hawthorn, with woodland adjoining. The habitat is the nearest to the climax found on the Fen, where mature trees are uncommon. Reed Sedge Warblers are both numerous, but surprisingly perhaps, woodland birds such as tits and thrushes are not particularly numerous.

A2 is the common Fen in the NE corner. A narrow plot of uncut sedge edged on both sides by carr, which on the north side is fairly mature with a small area of young Oakwood. Reed and Sedge Warblers are present in roughly equal numbers but are not particularly numerous. A wide range of species is present, but none are very abundant, although tits and finches are fairly well represented.

B lies at the extreme NE corner of the Fen, and in this area, the underlying clay soil reaches the surface, and there is thus a different kind of habitat from that found on the peat-covered fen. The netting sites represent the boundary between dense hawthorn and willow thickets on the peat, and the hawthorn scrub interspersed with rough grassland on the clay. Sedge grows in the small open areas on the peat. This area has the richest and most diverse avifauna of any found on the Fen. Tits, thrushes, Reed, Sedge and other Warblers, Dunnocks and finches are well represented. This is shown particularly by the very large number of juveniles caught. It must be remembered that 300 feet of net were used on this site as against 200 on all the others, but the catches are still larger on this site than any other even when this has been allowed for.

FR is the ride running along the SE edge of the Reed Bed on Adventurers' Fen. The reed bed is a large (50 acres) stand of almost pure reed with a thick hawthorn-fringed ride between it and a wet field of rough pasture with rushes. Sedge and Reed Warblers are approximately equally numerous. Some tits and finches are fairly well represented.

FL is on the opposite side of the Reed Bed from FR, from which it differs somewhat. On FL, the Reed Bed is edged with scattered hawthorns and a dense growth of grasses and willow herbs, and this appears to make it a better habitat, particularly for Reed Warblers, but also for Sedge Warblers. For some unknown reason, many more juvenile birds were caught on this site than on FR, although there were less adults.

### Conclusions

Before it is possible to assess the suitability of this method of estimating bird numbers in a habitat, it is necessary to repeat the observations



Table 1  
Captures of adult birds

Species	Site totals			FR	FL	Grand Total	Weekend totals		
	A1	A2	B				May	Jul	Aug
Snipe	-	-	-	3	-	3	3	-	-
Swallow	2	1	2	2	-	7	4	3	-
Cuckoo	-	-	-	1	-	1	1	-	-
Jay	-	-	1	-	-	1	-	1	-
Great Tit	-	3	2	-	1	6	3	1	2
Blue Tit	-	5	4	3	3	15	9	3	3
Willow Tit	-	2	2	-	2	6	1	3	2
Long-tailed tit	2	3	3	2	-	10	6	3	1
Tree Creeper	1	1	-	-	-	1	-	1	-
Wren	5	3	8	2	1	19	7	8	4
Song Thrush	4	2	23	2	4	35	18	10	7
Blackbird	5	4	14	5	2	30	18	9	3
Nightingale	-	-	1	-	-	1	-	1	-
Robin	5	1	2	2	3	13	7	4	2
Grasshopper Warbler	-	1	2	-	1	4	1	2	1
Reed Warbler	31	19	31	18	70	169	37	80	52
Sedge Warbler	30	19	42	16	33	140	70	37	33
Blackcap	5	1	8	5	-	19	6	6	7
Garden Warbler	-	-	-	-	-	-	-	-	-
Whitethroat	2	-	5	2	3	12	7	4	1
Lesser Whitethroat	1	-	9	-	2	12	10	1	1
Willow Warbler	3	3	7	-	2	15	10	2	3
Chiffchaff	-	2	2	-	-	4	1	2	1
Spotted Flycatcher	3	-	1	-	2	6	-	5	1
Dunnock	7	16	22	2	13	60	20	26	14
Red-backed Shrike	-	-	-	-	-	-	-	-	-
Greenfinch	3	7	2	5	2	19	10	3	6
Goldfinch	2	2	6	2	-	12	4	8	-
Linnet	-	-	-	-	-	-	-	-	-
Redpoll	4	2	9	2	10	27	14	10	3
Bullfinch	10	7	23	1	7	48	25	11	12
Chaffinch	-	-	9	-	-	9	2	5	2
Yellowhammer	-	-	2	-	-	2	1	1	-
Reed Bunting	2	6	8	8	3	27	15	6	6
Tree Sparrow	5	-	10	-	-	15	10	3	2
Totals	131	110	260	83	164	748	320	259	169

another. When more data of this kind have been accumulated, a fuller analysis of the diversity of species in a habitat and the habitat preferences of particular species should be possible. The difference between sites and species which have been shown briefly in this note are, by and large, as one would expect, and it is hoped that more work of this kind will provide more detailed and useful information.

Table 2  
Capture of juvenile birds

Species	Site totals			FR	FL	Grand total	Weekend total		
	A1	A2	B				May	Jul	Aug
Snipe	-	-	-	-	-	-	-	-	-
Swallow	-	-	-	1	-	1	-	1	-
Cuckoo	-	-	-	-	-	-	-	-	-
Jay	-	-	-	-	-	-	-	-	-
Great Tit	-	2	10	10	-	22	-	5	17
Blue Tit	3	8	40	6	8	65	-	22	43
Willow Tit	2	4	6	3	1	16	-	8	8
Long-tailed Tit	-	1	1	-	-	2	-	1	1
Tree Creeper	1	-	1	-	-	2	-	1	1
Wren	7	9	10	4	8	38	-	16	22
Song Thrush	1	-	13	5	-	19	4	8	7
Blackbird	-	1	6	6	2	15	-	6	9
Nightingale	1	-	-	-	-	1	-	1	-
Robin	14	12	14	3	-	43	-	21	22
Grasshopper Warbler	-	-	3	-	1	4	-	-	4
Reed Warbler	6	13	11	15	16	61	-	4	57
Sedge Warbler	22	11	46	18	34	131	-	65	66
Blackcap	4	3	9	8	5	29	-	2	27
Garden Warbler	-	-	3	-	-	3	-	-	3
Whitethroat	1	-	16	-	4	21	-	8	13
Lesser Whitethroat	-	-	3	-	-	3	-	-	3
Willow Warbler	3	13	18	15	12	61	-	19	42
Chiffchaff	3	6	10	3	4	26	-	13	13
Spotted Flycatcher	-	-	-	-	-	-	-	-	-
Dunnock	1	6	48	9	3	67	-	24	43
Red-backed Shrike	-	-	-	1	-	1	-	-	1
Greenfinch	-	-	1	-	-	1	-	-	1
Goldfinch	-	-	1	3	1	5	-	3	2
Linnet	-	-	1	-	1	2	-	1	1
Redpoll	2	-	17	3	1	23	-	4	19
Bullfinch	4	4	4	14	3	29	-	4	25
Chaffinch	1	-	12	2	-	15	-	4	11
Yellowhammer	-	-	5	-	-	5	-	-	5
Reed Bunting	-	-	9	2	1	12	-	7	5
Tree Sparrow	-	-	43	-	-	43	-	9	34
Totals	76	93	361	131	105	766	4	257	505

It need hardly be emphasised that the number of birds caught in the three weekends of intensive effort was 1512. This represents a very valuable contribution to the year's ringing total and collection of information on wing lengths and weights. This reason alone would almost be enough to justify continuing the programme, even without the promise of some very interesting findings in years to come.