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WILLOW WARBLERS IN LONG-TERM DECLINE

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Dawn Balmer, Steve Freeman and *Chris Wernham* of the BTO's Demography Unit report on population and productivity changes on Constant Effort Sites 1999-2000.

EL MOSQUITERO MUSICAL EN DECLIVE DE LARGO PLAZO
Dawn Balmer, Steve Freeman y *Chris Wernham* de la Unidad de Demografía del BTO informan sobre cambios poblacionales y de productividad en los Sitios de Esfuerzo Constante 1999-2000.

UN DECLIN A LONG-TERME POUR LE POUILLOT FITIS
Daum Balmer, Steve Freeman et *Chris Wernham*, de l'unité de démographie du BTO, décrivent les changements de population et de productivité sur les Constant Effort Sites en 1999-2000.

FITIS MIT KONTINUIERLICHER BESTANDSABNAHME
Dawn Balmer, Steve Freeman und *Chris Wernham* von der BTO Demography Unit berichten über Änderungen in Bestand und Produktivität auf Dauerfangflächen (CES) von 1999-2000.

The popular and highly successful Constant Effort Sites (CES) Scheme completed its 20th year of operation in 2000.

Running a CES site involves ringing in a standardised way, erecting mist-nets in the same positions and for the same length of time during twelve visits spread between early May and late August each year. Being a CES ringer requires dedication and an aptitude for very early mornings — 4am is the norm rather than the exception!

Because of the standardised approach, we are able to use data from catches to monitor changes in the abundance and productivity of common breeding songbirds. Changes in the total number of adults caught enable us to measure changes in population size, while changes in the ratios of young birds to adults are used to monitor changes in breeding success. We also use retraps of adult birds ringed in previous years to estimate annual survival rates. Over this past winter, we have completely updated and automated the process of producing results from CES data, so that we are now easily able to calculate long-term trends in numbers of adults and breeding success. We encourage CES ringers to send in their data promptly each year in electronic form. This allows us to produce timely results, identify any worrying changes in abundance and breeding success, and highlight these to other conservation bodies. We have also produced some up-to-date trend graphs for the Wider Countryside Report on the BTO web site (www.bto.org). In this article we have included information on long-term trends in the "new look" table of results (Table 1).

TABLE 1. Changes in captures on CES sites from 1999 to 2000

	Adults		Juveniles		Adult Abundance		Productivity (juvs per adult)	
Species	n 2000	Total	n 2000	Total	% Change	Long-term trend	% Change	Long-term trend
Wren	101	779	98	1716	-2	⇒	-5	⇑
Dunnock	102	652	99	1025	-6	⇒	-1	⇒
Robin	99	576	98	1839	+1	⇑	-6	⇓
Blackbird	103	983	91	717	+1	⇓	-3	⇒
Song Thrush	84	317	72	200	+3	⇓	-20	⇒
Sedge Warbler	71	1194	69	1655	+11 *	⇒	+10	⇒
Reed Warbler	61	2272	59	2225	+18 *	⇓	-15 *	⇑
Lesser Whitethroat	31	95	47	199	+11	⇓	+48	⇒
Whitethroat	58	377	65	618	+21 *	⇒	-1	⇒
Garden Warbler	59	336	62	327	-14 *	⇒	+3	⇓
Blackcap	90	895	95	1880	-16 *	⇑	+23 *	⇒
Chiffchaff	72	313	84	1196	+12	⇑	+7	⇒
Willow Warbler	89	1342	90	1843	-16 *	⇓	+15 *	⇓
Long-tailed Tit	86	534	86	1209	+23 *	⇒	-8	⇒
Willow Tit	13	20	19	63	-32	⇒	+7	⇒
Blue Tit	95	597	97	1979	-7	⇒	+47 *	⇓
Great Tit	92	464	96	1146	-1	⇒	+14	⇒
Treecreeper	42	77	64	178	-18	⇒	-7	⇒
Chaffinch	78	578	59	343	+10	⇒	-22 *	⇑
Greenfinch	38	211	25	135	-4	⇑	+19	⇒
Goldfinch	37	109	23	56	-13	⇒	-10	⇒
Linnet	14	52	14	34	-46 *	⇓	+11	⇒
Bullfinch	82	460	59	313	-9	⇓	-23 *	⇒
Reed Bunting	65	342	39	210	-5	⇓	-12	⇒

n 2000 = number of sites operated in 2000 at which the species was captured
Total = total number of individuals captured on sites (for adults and juveniles separately) during 2000
% change = percentage change in numbers of birds caught between 1999 and 2000
* = significant change at the 5% level
Long-term trend = long-term trend during the period of CES ringing. See *Wider Countryside Report* on the BTO web site for further details
⇑ = long-term trend shows an increase
⇓ = long-term trend shows a decline
⇒ = long-term trend shows stability

NEW HIGH IN 1999

The number of sites operated in 1999 reached a new high of 138. We are on target to achieve a similarly high number for 2000. This is a tremendous achievement by all concerned. Fourteen sites were operated for the first time in 2000, including new sites in Scotland and Ireland.

Ringers have made superb progress computerising their data in recent years. In 2000, over 90% of the CES data were received in an electronic format.

The data we present here come from 121 CES sites: 99 from England, 14 from Scotland, 5 from Ireland and 3 from Wales. The habitats covered are similar to previous years, with the majority of sites located in reedbed, wet scrub or dry scrub and a smaller number of sites in deciduous woodland.

LONG-TAILED TITS UP

For most parts, the 1999/2000 winter was relatively mild, which probably helped many of

our resident species to survive through to the following breeding season. During the early part of the CES season, ringers had to contend with flooded sites, with some net rides inaccessible for a week or more. Nest recorders and survey workers reported good numbers of resident species, such as Wren, Robin and Chaffinch. Long-tailed Tit was the only resident to show a statistically significant increase in numbers on CES sites (Table 1), with an increase of 23% in the catches of adult birds between 1999 and 2000 (see Box 1 for further information). There were also statistically significant increases in the numbers of adult Sedge Warblers, Reed Warblers and Whitethroats caught between 1999 and 2000. This may suggest more favourable conditions in their wintering grounds. Interestingly, all three species winter in a similar geographical area (West Africa) and Reed Warblers and Sedge Warblers tend to occupy freshwater habitats such as reedbeds, papyrus stands and the marshy fringes of lakes, whereas Whitethroats prefer dry scrubby habitats. Long-term trends in the abundance of adult Sedge Warblers and Whitethroats suggest a fairly stable population. Reed Warblers show a long-term decline in adult abundance, so the increase seen this year may just be a short-term blip.

Garden Warblers, Blackcaps and Willow Warblers showed statistically significant declines in adult numbers between 1999 and 2000, perhaps suggesting less favourable conditions on the wintering grounds. There is some evidence to suggest that many Blackcaps from Britain and Ireland winter in the Mediterranean basin and North Africa, with smaller numbers reaching West Africa. Information from ringing recoveries suggests that both Garden Warblers and Willow Warblers winter mainly around the Ivory Coast and Ghana and occupy wooded habitats. Perhaps there could have been slight differences in the environmental conditions between the part of West Africa where Sedge Warblers, Reed Warblers and Whitethroats spend the winter, and the more southerly part of West Africa that might account for the differences in over-winter survival? It is possible that those species using more wooded habitats are not affected by drought to the same extent as those species wintering in the freshwater habitats. In the long-term, the Blackcap population has increased whereas the Garden Warbler population has remained approximately stable. Linnet was the only species with a resident population to show a statistically significant decrease in numbers between 1999 and 2000, a continuation of the long-term decline of this species on Constant Effort Sites. Regular readers will note that Redpoll has been omitted from the list of species regularly reported on by CES ringing. The number of sites catching Redpolls dropped to an all time low in 2000, so that we can no longer confidently report on the fortunes of this species. We have added Willow Tit to the list of species, as numbers of sites monitoring this species are acceptable.

MIXED BREEDING SUCCESS

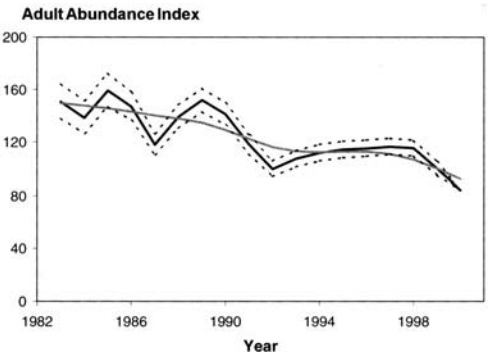
Early breeders seemed able to take advantage of the favourable conditions during a largely dry, settled and sunny March 2000. For the third successive April, inclement weather upset early nesting attempts. Localised heavy downpours led to difficult conditions for some species. The weather picked up in late April and early May, only to return to unsettled weather in mid May. CES ringers and nest recorders reported huge losses as a result of the wet weather. The effect on nestbox species appears to have been particularly localised.

Overall, breeding success in 2000 was mixed (Table 1). Despite heavy losses in some areas, Blue Tits had a successful breeding season overall, and this was one of only three species to show a statistically significant increase; the two others were Blackcap and Willow Warbler. In the long-term, Blue Tits are showing a decline in productivity, coupled with a stable breeding population. Willow Warbler productivity is also declining in the long-term, despite an increase in 2000.

Following a successful breeding season in 1999, Reed Warblers showed a statistically significant decline in productivity in 2000. It is possible that early clutches were lost during the poor weather but that sunnier, warmer weather in late July may have helped them to rear late broods. Two finches, Chaffinch (small increase in adult numbers and small decrease in juvenile numbers) and Bullfinch (small decline in adults but large decline in juveniles) also showed

BOX 1. LONG-TERM TRENDS UP AND DOWN

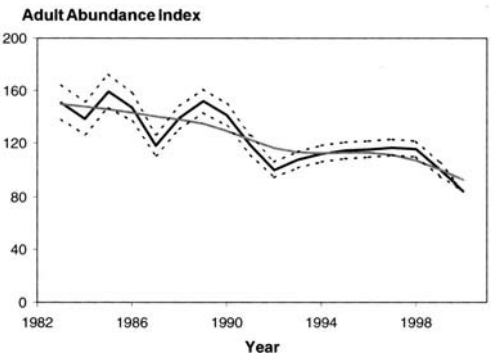
Here we present the long-term trends in adult numbers for Willow Warblers and Long-tailed Tits. Long-term trends are far more important in conservation terms than annual fluctuations, which may be linked to particular short-term weather events.



Catches of adult Willow Warblers have shown a long-term decline (32%) during the period of CES ringing. Note that the Index is set to 100 in 1999. The graph shows that between 1983 and 1989 the Index fluctuated but showed no clear trend. It then fell sharply from 1989 to 1992 and has shown little recovery since. The population decline during this period was well documented by the Common Birds Census, and further analyses using information from CES sites revealed that the decline was probably caused by a large reduction in the survival rates of adult birds. This suggests that factors away from the breeding grounds may have caused most of the change in breeding numbers. Interestingly, the survival rates of Willow Warblers ringed in northern Britain did not change whereas the adult survival rates of southern birds declined from 45% during 1987-1988 to 24% during 1991-1992. The reason for the decline in survival rates is unclear but habitat loss or deterioration on the wintering grounds might be a possible reason. Also it is possible that Willow Warblers from the north and south of Britain winter in slightly different regions of Africa and have therefore been subjected to different environmental changes (Peach et al 1995). Following this sharp decline, the Willow Warbler population remained fairly stable until 1998, then declined again.

Using information from CES and the Nest Record Scheme we issued an alert to JNCC in March 2000, highlighting high conservation concern for Willow Warbler. Information from Nest Record Cards has shown a significant increase in nest failure rates at the nestling stage. It would be extremely interesting to look again, in detail, at the population changes of Willow Warblers, given that we now have a longer run of data on survival rates and information on productivity from CES ringing.

Catches of adult Long-tailed Tits have shown a long-term increase (31%) during the period of CES ringing. Note that the Index is set to 100 in 1999. The population index for Long-tailed Tit has shown many annual fluctuations over time, despite the general upward direction. The severe weather of February 1991 probably accounts for the reduced catch of adult Long-tailed Tits in that year but the weather does not appear to affect this species as much as it does for other resident species, such as Wren, Robin and Dunnock (see *BTO News* 227). The productivity of Long-tailed Tits has remained relatively stable, which might suggest that the increase in adult numbers is more likely to be due to increased survival. The recent mild winters have no doubt helped Long-tailed Tits to survive in higher numbers. Information from Garden BirdWatch shows that there is a regular influx of Long-tailed Tits into gardens during late winter when food is particularly scarce in the wider countryside.



statistically significant declines in breeding success in 2000. Chaffinch nests seem particularly prone to becoming saturated during heavy downpours, which may lead to losses during such weather conditions.

New Constant Effort Sites are still required. If you are interested in joining the scheme please contact Dawn Balmer at BTO for further information. Sites must be run by specially trained and licenced ringers, although help from non-ringers is much appreciated. If you like the sound of CES ringing, why not consider becoming a trainee ringer? Contact the Ringing Office at BTO HQ for details.

REFERENCES

Peach, W.J., Crick, H.Q.P. & Marchant, J.H. 1995. The demography of the decline in the British Willow Warbler population. Journal of Applied Statistics 22: 905-918.

THANK YOU

As with all ongoing BTO projects, the success of the CES Scheme depends entirely on the dedication, enthusiasm and skill of its volunteers. We are grateful to all ringers who participated in the scheme in 2000. Special mention must be made to the four sites that completed 20 years of operation in 2000; Llangorse Lake run by Jerry Lewis and Llangorse RG, Treswell Wood run by Treswell Wood IPM Group, Kimpton Mill run by Tom Kittle and Marsworth Reservoir run by Stuart Downhill and Aylesbury Vale RG. This is an incredible achievement — congratulations and thank you.

Whilst space prevents us from acknowledging all CES ringers, we would like to thank the following ringers and groups for their continued support: Basildon RG, Chew Valley RS, R C Cole, Gibraltar Point BO, J A Glazebrook, R J Graham, A Hilton, Itchen RG, A J Johnston, A Kerr, R J Lanaway, A J Langstaff, A W Lauder, Merseyside RG, Nunnery RG, M E O'Donnell, R Proctor, C M Reynolds, L F Roberts, D Robertson, S T Robinson, M H Rogers, K P Royles, Severn Vale RG, SW Lancs RG, SW Notts RG, R Smith, Stour RG, W G Taylor, D J Turner, R J Wakeling, C Walton, Wicken Fen RG, W Wilts RG. (BO= Bird Observatory, RG= Ringing Group, RS= Ringing Station).

The Constant Effort Sites Scheme was undertaken within the Partnership between the BTO and JNCC as part of its programme of research into nature conservation.