Pete Miles Bircham

CONTENTS

ACKNOWLEDGMENTS

We wish to thank all those who have helped the Group in so many ways during 1972.

Foremost, we are very grateful to the National Trust: Wicken Fen Local Committee for continuing to allow us facilities on the Fen for ringing. By waiving access and camping restrictions, and by allowing the Group to install a ringing hut, the Committee has made the Group's operations more comfortable and successful. The National Trust has also tangibly supported the Group by reimbursing the cost of rings used during the year and by allowing use of the W.H. Thorpe building. To the National Trust Assistant Agent, David Garnett, the Committee Secretaries, Dr. John Smart, Dr. Max Walters and John Harvey, and the Warden, Lt. Col. Charles Mitchell, the Group is greatly indebted;

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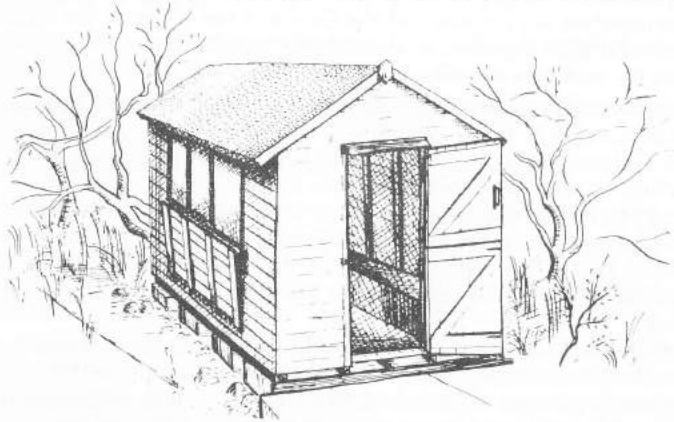
Wicken Fen Group Report No.4 1972

INTRODUCTION

This report marks the completion of five years work on the Fen and the fourth year of existence of the Wicken Fen Group. The function of the Group and its membership is now stabilised. Training and recruitment of new ringers approximately matches the loss from migration or diminution of interest. Not without considerable effort on the part of the secretary in 1972, it was possible to ensure that teams were on the Fen every weekend from the beginning of April to the middle of October and two teams were operating simultaneously on eight of these weekends. Operations on the Reed Bed have been made substantially more comfortable by the erection of a hut beside Harrison's Drove. The money for this was largely provided by a generous donation from industry for which the Group is very grateful. After the erection and ceremonial opening in early May, it was fitted with seats, storage space and a bench. Working in it, especially in nasty weather is much more pleasant than the previous arrangements and very good for morale.



The number of birds ringed (2968) fell compared with 1971. This was due in part to the fact that no attempt was made to catch Swallows. The weekends from mid-July to mid-August, when it is sometimes possible to catch large numbers of young birds, were not notable for good mist netting weather. Mid-June also was a period of cool and wet weather which may have influenced the breeding success of some birds. An attempt to catch birds in the carr opposite the Reed Bed in late July was not very successful perhaps in part a confirmation of the long held belief that the carr holds a low density of birds both breeding and feeding. Notable was the number of Reed Warblers, mainly ringed, which commute over the Lode to feed.

Unusual birds caught during the year included the first Bearded Tits, Great Spotted Woodpecker, Whinchat and Yellow-faced Grassquit for the Group. Of course it is primarily the most numerous birds which are

of value and another years data mean that valid analysis is possible for more species as the samples become large enough. This report contains studies of the Willow Warbler, Redpoll and Wren which would not have been possible two years ago.

Ringing tends to be a time consuming activity and it is never easy to ensure that the results collected are good value for the effort expended (5880 man hours in 1972). This summer saw an interesting development in feeding studies of Reed and Sedge Warblers reported later in these pages. It is increasingly apparent that such studies are necessary to ensure the valid interpretation of results from ringing and weighing birds. At the same time, it is encouraging to see the possibility of ringing data being of use to support more intensive studies as suggested in the note on measuring bird activity from the results of mist netting. Ringing has never been the sole aim of the Group and the more varied the study methods used the more valuable the accumulated results will become. A small amount of mapping of singing birds was done in 1972 and it transpired that this kind of work is not only interesting but can easily be done without interfering with the routine of ringing. It is hoped that more people will become interested in such studies on the Fen.

Extra studies can also take advantage of the bird in the hand. This Report describes results of three; the study of ticks, ageing of Long-tailed Tits and identification of Tree Creepers.The tick study is not being conducted at Wicken, but as the majority of serious ringers in Cambridgeshire are members of the Group, a few pages of the Report have always been regarded as available for publication of work conducted by members elsewhere in the county.

Comprehensive recording of moult has continued; nearly 500 cards were completed in 1972, including 130 for Tree Sparrows, 83 for Long-tailed Tits and useful but lesser numbers for 23 other species. Further reporting on moult is expected in future years, but generally it is difficult to collect enough records and there are as yet few species for which analysis would be possible. A limited amount of bill measuring was done late in the season with a view to finding how bill shape and size relate to feeding of insectiverous birds, but it is too early to report on this.

In return for the considerable help and hospitality afforded to the Group by the National Trust, attempts were made to use some of the manpower to help in return. A certain amount of tree planting along Harrison's Drove in the spring was unfortunately thwarted by the attentions of cows later in the summer. It is hoped that the Group's observations may be of help in providing the National Trust with some of the information on which to base its management plans for Adventurers' Fen. A special survey of the developments of plant and bird life on the new scrape on Rothschild's Lapwing is planned.

Finally of course the Group is judged by its tangible products. The continued publication of a report with contributions from a good many members remains the most obvious sign of productivity and enthusiasm. The Group still maintains its claim to be the only organisation of its kind to produce a printed annual report in the first week of the following January. The interest in cricket continues, and the BTO was defeated in June, so members of the Group continue to enjoy variety and light-hearted moments in addition to the more serious work.

SOME NOTES ON SELECTED SPECIES

There follow notes on some of the more interesting sightings of birds made at the Fen in 1972 in the course of the Group's normal operations. These refer to the area of South Adventurers' Fen unless stated otherwise. Waders have been excluded for consideration elsewhere.

Canada Goose A pair was present from mid-April and nested in the vicinity of the Mere. 5 chicks hatched in early June and 3 survived to flying age.

Marsh Harrier A dark (probably female) bird was seen on June 3rd and 16/17th. A single flew south on September 9th.

Kestrel Ones and twos were seen throughout the summer as usual and on September 2nd, 9+ were seen during a circumnavigation of the Fen. A male found dead on Rothschild's Lapwing in May 1970 was found by the Nature Conservancy to contain 50ppm of DDE and 11.0ppm of Dieldrin in the liver. This DDE level is relatively high and the Dieldrin figure is exceptionally high and could have been a contributory factor in the death of the bird. Such are the problems of a Nature Reserve surrounded by intensive arable farming.

Barn Owl Singles sighted on six occasions between June 17th and July 26th mainly in the vicinity of Rothschild's Lapwing.

Little Owl One near Spinney Bank on June 16th and a pair with 2+ young at Priory Farm on July 14th.

Long-eared Owl One caught on June 3rd and singles seen on four subsequent dates.

Short-eared Owl One on September 23rd.

Great Spotted Woodpecker Individuals were recorded unusually frequently in the summer and a nest was found near the Brick Pits on May 20th, when it contained noisy young. The nest was only 4 feet off the ground in a partially dead willow. It seemed that the adults must have ranged over much of the Fen while feeding the young.

Lesser Spotted Woodpecker The female caught on September 18th 1971 apparently spent the winter in the area and was recaught on April 15th. A male was heard drumming and calling on April 30th, but there was no sign of either subsequently.

Woodlark One flew north-west on August 4th.

Bearded Tit Present in the usual small numbers in winter and last seen on April 28th. On February 26th two were caught of which one had already been ringed in Kent and the other was caught there subsequently which is the first and slightly surprising indication of where these birds come from.

Mistle Thrush One caught on June 3rd and 3 seen on July 29th. This species is surprisingly uncommon in summer and these are the first recorded since one in 1968.

Blackbird A female ringed in 1971 was found dying at the Brick Pits on July 7th. It had a fish hook firmly attached in its throat and was trailing a small length of nylon. The bird had lost its tongue and tail.

Wheatear Singles at 100 Acre Farm on September 2nd, near Upware on the same date and at Priory Farm on September 24th.

Whinchat One seen at 100 Acre Farm on September 2nd and one caught on September 24th.

Goldcrest Single juveniles were caught at the Reed Bed and the Brick Pits on July 8th. 2 were caught on November 12th.

Tree Pipit One on September 5th.

Grey Wagtail Singles flew south on September 5th & 7th.

Brambling 1000+ moved over on February 26th.

Yellow-faced Grassquit A male was caught on July 15th. This central American finch has never been recorded in the wild in the British Isles and there is every reason to doubt that this one arrived naturally!

RECOVERIES

The following list covers all recoveries and controls of birds more than 10km from the place of ringing, notified to the Group by the B.T.O. since the last report.

Three Swallows caught at their roost in autumn 1971 were found the next summer in places between 100 and 250 miles NW of Wicken. This north westerly origin ties in with the Calf of Man Swallow controlled at Wicken in September 1971 (see 1971 report). Of two Bearded Tits caught at Wicken in February, one had been ringed in Kent in the summer of 1970. Interestingly, its companion (ringed at Wicken)returned to that same region for the summer 1972, confirming the established pattern of British Bearded Tits dispersing from their breeding areas for the winter, then returning in subsequent summers. Two Sedge Warbler recoveries slightly redress the imbalance between this species and the Reed Warbler. JH 18089 and JH 18993, juvenile Reed and Sedge Warblers respectively, were both recovered very shortly after ringing, adding support to the impression that birds leaving Wicken in autumn move short distances rather than put on fat for long flights in the way that seems to occur on the south coast. At ringing, these individuals had the very ordinary weights of 10.5 and 11.0 grams respectively. Reed Warbler HV41643 was apparently going in the wrong direction, but pride of place undoubtedly goes to JE64237. Very few passerines (Swallows excepted) have ever been recovered south of the Sahara, and at the time of the last published report (1969) only two Reed Warblers enjoyed this distinction. The distant recovery of a Tree Sparrow is unusual and interesting in view of the fact that this species also has an exceptionally low retrap rate at the Fen.

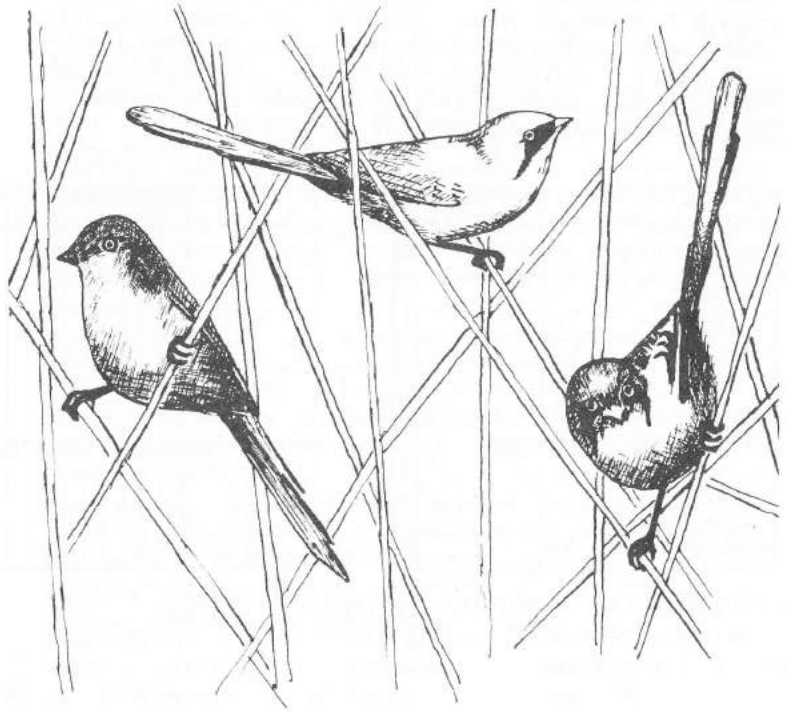
Key to symbols and terms

2—bird ringed, age unknown
3—bird ringed in the calendar year of hatching
4—bird ringed in the year following hatching or later
m—male
v—controlled (caught alive and released)
+—shot or killed by man
x—recovered (found dead)

Mallard	GM96914	4m	28. 7.71	WF	
		+	17.11.71	Linton (Cambs)	22km S
Swallow	JH18294	3	24. 9.71	WF	
		v	30. 5.72	Ashkirk (Selkirk)	410km NW
	JH18395	3	18. 9.71	WF	
		x	20. 6.72	Hyde (Cheshire)	200km NW
	JE64113	3	1.10.71	WF	
		vm	13. 9.72	Doncaster (Yorks)	170km NW
Long-tailed Tit	526125	2	18. 9.71	WF	
		x	2. 3.72	St Ives (Hunts)	24km W
	542004	2	30.10.71	Hauxton (Cambs)	
		v	30. 4.72	and	
			20. 5.72	WF	23km NE
Bearded Tit	JA68363	3m	11. 7.70	Murston (Kent)	
		v	26. 2.72	WF	110km NNW
	JH17332	4m	26. 2.72	WF	
		v	1. 7.72	Murston (Kent)	110km SSE
Redwing	CP64271	2	26.10.69	WF	
		+	—. 1.71	Braga (Portugal)	1360 kmSW
	CP64725	3	10.10.71	WF	
		+	18.11.71	Calahorra (Spain)	1080km SSW
Reed Warbler	HV41643	4	13. 7.72	Wycombe (Bucks)	
		v	26. 8.72	WF	100km NE
	JC74446	4	30. 7.71	Manea (Cambs)	
		v	6. 5.72	WF	27km SSE
	JH18089	3	8. 9.71	WF	
		v	18. 9.71	Beachy Head (Sussex)	170km S
	JE64237	4	6. 6.71	WF	
		x	16. 9.72	Nouadhibou (Mauritania)	3900km SSW
Sedge Warbler	JA02451	3	3. 9.71	Holme (Norfolk)	
		v	13. 5.72	WF	75km SSW
	JH18993	3	29. 7.72	WF	
		x	6. 8.72	Portland (Dorset)	275km SW
Blackcap	JH17649	3	14. 8.71	WF	
		vm	8. 5.72	Peakirk (Northants)	53km NW
Garden Warbler	JH17634	3	1. 8.71	WF	
		x	23. 7.72	Carlton (Notts)	145km NW
Chiffchaff	439113	3	18. 7.71	Toft (Cambs)	
		v	13. 5.72	WF	24km NE
	485008	4	17. 4.71	Staines (Middlesex)	
		v	9. 7.72	WF	108km NNE
Reed Bunting	JH17234	3m	10.10.71	WF	
		v	27. 2.72	Coton (Cambs)	18km SW
Tree Sparrow	JB30813	4	16. 5.71	WF	
		v	27.11.71	Staines (Middlesex)	108km SSW

SPECIES RINGED IN 1972

	Site A, B & H	Site F & G	1972 total	Grand Total 1968-1972
Mallard	–	–	–	5
Red-legged Partridge	–	2	2	5
Water Rail	–	–	–	1
Moorhen	–	–	–	1
Lapwing	–	–	–	1
Snipe	–	4	4	29
Jack Snipe	–	–	–	1
Woodcock	–	1	1	3
Woodpigeon	–	–	–	6
Turtle Dove	1	2	3	13
Collared Dove	1	–	1	5
Cuckoo	–	2	2	12
Tawny Owl	–	–	–	5
Long-eared Owl	–	1	1	2
Swift	–	1	1	2
Kingfisher	3	9	12	38
Great Spotted Woodpecker	1	–	1	1
Lesser Spotted Woodpecker	–	–	–	1
Skylark	–	–	–	7
Swallow	2	180	182	1158
House Martin	–	–	–	1
Sand Martin	–	–	–	1
Jay	3	1	4	6
Great Tit	6	2	28	175
Blue Tit	21	73	94	470
Coal Tit	–	–	–	4
Willow Tit	7	4	11	120
Long-tailed Tit	21	35	56	213
Bearded Tit	–	1	1	1
Tree Creeper	1	4	5	37
Wren	36	96	132	481
Mistle Thrush	–	1	1	2
Fieldfare	–	–	–	10
Song Thrush	38	146	184	793
Redwing	–	2	2	36
Blackbird	23	69	92	589
Whinchat	–	1	1	1
Redstart	–	–	–	6
Nightingale	–	–	–	7
Robin	26	32	58	378
Grasshopper Warbler	1	10	11	65
Great Reed Warbler	–	–	–	1
Reed Warbler	59	389	448	1638
Sedge Warbler	20	196	216	1254
Blackcap	31	81	112	377
Garden Warbler	3	10	13	59
Whitethroat	7	9	16	120
Lesser Whitethroat	6	15	21	112
Willow Warbler	14	77	91	642
Chiffchaff	13	14	27	192
Goldcrest	1	3	4	9
Spotted Flycatcher	5	16	21	67
Dunnock	60	96	156	738
Meadow Pipit	–	1	1	5
Tree Pipit	–	–	–	1
Pied Wagtail	–	–	–	7
Yellow Wagtail	–	–	–	3
Red-backed Shrike	–	–	–	1
Starling	–	–	–	11
Greenfinch	5	35	40	189
Goldfinch	8	49	57	190
Linnet	–	37	37	126
Redpoll	91	143	234	538
Bullfinch	64	132	196	778
Chaffinch	8	11	19	160
Brambling	–	–	–	23
Yellowhammer	6	5	11	51
Corn Bunting	–	4	4	8
Reed Bunting	44	156	200	853
House Sparrow	–	–	–	1
Tree Sparrow	149	5	154	763
TOTALS	785	2183	2968	13609



FEEDING ECOLOGY OF REED AND SEDGE WARBLERS

Introduction.

The Reed Warbler and Sedge Warbler differ in geographical range and also in the range of habitats occupied. However they often coexist in the same habitat, as they do in the areas around the Mere and the Reedbed at Wicken. This paper is a progress report on a study of the feeding behaviour of these birds.

The Study Area.

The area has three main habitat types,

i) carr, consisting mainly of *Salix* and *Crataegus* bushes, 2-6 metres in height.

ii) reedbed *Phragmites* with stands of Willowherb *Epilobium*, grasses and other low vegetation.

iii) rush fields *Juncus*.

At the margins of the Reedbed and the rush fields are ditches lined with bushes, reeds, rushes, grasses and sedge. The Reed and Sedge Warblers studied were breeding near these ditches and had easy access to all three habitat types.

Feeding Habitat

Pairs of adult birds feeding young were watched through binoculars from suitable vantage points so that disturbance of the birds was minimised. The whereabouts of a foraging bird was noted at ten second intervals. It proved possible to collect continuous observations on 11 pairs of Sedge Warblers and 10 pairs of Reed Warblers ranging from 13 to 78 minutes in total duration. Figure 1. summarises the data collected. Reed Warblers forage significantly more in bushes than do Sedge Warblers which tend to spend most of their time in rushes.

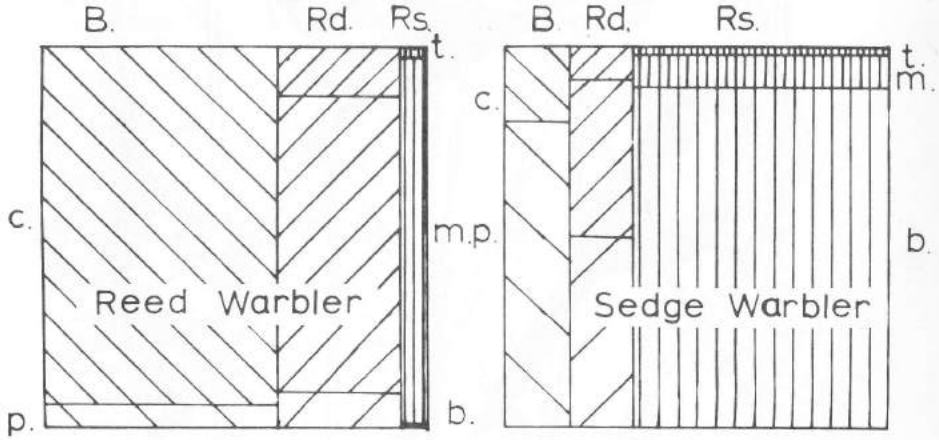


FIGURE 1 Feeding habitats of Reed and Sedge Warblers. Areas are proportional to the time spent in each habitat category.

B—bushes	c—centre	t—top
Rd—reeds	p—periphery	m—middle
Rs—rushes		b—bottom

Catchpole (1972) has recorded a similar difference in habitat selection at another site. When feeding in bushes, Reed Warblers use the centre of the bush while Sedge Warblers tend to hunt in the peripheral foliage. There was no significant difference in the foraging heights of the two species in bushes. However when feeding in reeds and rushes, Reed Warblers forage higher than Sedge Warblers. Thus there is little overlap in the feeding stations of the two species.

Feeding Techniques

Birds foraging in bushes were watched continuously for as long a period as possible (usually between 30 and 60 seconds). The time during which all their actions could be seen was recorded using a stopwatch and the numbers and types of feeding attempts were noted. Unfortunately it was impossible to judge whether or not feeding attempts were successful. In some cases the movements of the bird in the bush were also recorded. For this purpose movements were divided into three classes (<15cm., 15-60cm, and >60cm.)

Both species appeared to be feeding mainly on adult Diptera (flies). The techniques used in catching prey were classified into three main groups.

i) **Flycatching**: The bird sallies out from an exposed perch catching a flying insect on the wing.

ii) **Leap-catching**: The bird takes a flying insect in the air between two perches as it flits through the bush.

iii) **Picking**: The perched bird picks insects from leaves and twigs. Occasionally the bird may hover and pick up a resting insect.

Table 1. shows the frequencies of these feeding techniques and of the different movement classes for birds foraging in bushes.

Sedge Warblers collect almost all their food by picking and use many short movements in searching the foliage for insects. Reed Warblers use leap-catching and picking and occasionally flycatching in securing their prey. They show more large movements when flitting through a bush than do Sedge Warblers. When leap-catching Reed Warblers often brush the foliage with their bodies possibly to flush resting insects, and large changes of position within the bush might be advantageous in allowing them to find insects which have not been disturbed by previous catching attempts.

While leap-catching is an appropriate hunting technique in the well-spaced twigs and reeds frequented by the Reed Warbler there is no scope for this technique in the dense foliage and thick vegetation used by the Sedge Warbler. The Reed Warbler is probably better morphologically adapted to the leap-catching technique by virtue of its longer and wider bill (see Figure 2).

Reed Warbler fledgelings which are still being fed by their parents attempt to collect some food themselves mainly by picking. Independent young Reed Warblers in September (2-3 months after fledging) show more leap-catching, but still not as much as the adult birds in July. Although the food available may be different at these two times and cause the difference in feeding strategy it seems possible that leap-catching is a skilful technique requiring learning and development and is not perfected even in birds 2-3 months out of the nest.

Table 1. Feeding techniques in bushes—%frequency of different methods

	picking	leap-catching	fly-catching	capture attempts observed
Reed Warbler				
adults	24	71	5	468
independent juveniles	47	52	1	734
juveniles fed by parents	74	23	3	78
Sedge Warbler				
adults	94	6	0	72
independent juveniles	96	4	0	90
juveniles fed by parents	100	0	0	41

% frequency of different movement distances

	<15cm	15-60cm	>60cm	Movements observed
Reed Warbler				
adults	9	73	18	931
independent juveniles	8	79	13	2160
juveniles fed by parents	25	71	4	568
Sedge Warbler				
adults	23	67	10	132
independent juveniles	27	67	6	358
juveniles fed by parents	43	51	6	49

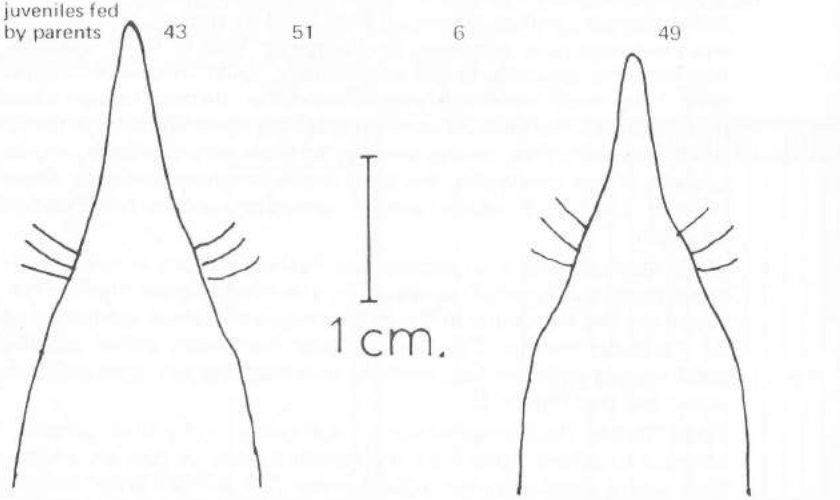


FIGURE 2 Bills of Reed and Sedge Warblers

Aggression while foraging

Adult Reed Warblers meet more often while feeding than do adult Sedge Warblers. This is probably because they feed to a greater extent outside their territories than Sedge Warblers (Catchpole 1972). Bush feeding focusses their attention on a few bushes which may be used by many pairs. Sedge Warblers, on the other hand tend to feed well spaced in large areas of *Juncus*. When Reed Warblers do meet,one usually chases the other from the bush. Reed Warblers will also chase away Sedge Warblers and sometimes other species (see Table 2.). The Reed Warbler's feeding performance is probably particularly susceptible to disturbance of the prey by other birds. Exclusion of intruders into the immediate vicinity of the foraging bird may be advantageous for this reason.

Table 2. Aggression while foraging.

Tabulated figures are percentages of contacts (two birds present in the same bush) on which aggressive behaviour was recorded. Figures in brackets refer to the numbers of contacts observed.

		Aggressor	
		Reed Warbler	Sedge Warbler
Recipient	Reed Warbler	87 (31)	0 (11)
	Sedge Warbler	45 (11)	0 (6)

Factors affecting feeding performance

Counts of actively foraging birds on fixed transects at different times of day (Table 3.) suggest that Reed and Sedge Warblers feed most actively in the hours just after dawn and just before dusk. This is very much confirmed by the pattern of catching in mist nets throughout the day (Figure 3). However, the results of insect trapping throughout the day, also shown in Table 3., indicate that insect abundance does not vary in the same way. Changes in the behaviour of the insects may however make them easier for the birds to catch at dawn and dusk. At these times flies can be seen resting on leaves and twigs and appear less active than in the middle of the day.

Table 3. Bird activity and insect abundance.

Counts of foraging birds were made on two days and the numbers combined. Insect abundance was assessed from the numbers of insects arriving hourly on six sticky traps set in *Salix* bushes.

Hours after dawn	0–4	5–8	9–12	13–16
	Numbers of birds observed feeding.			
Sedge Warbler	44	17	6	16
Reed Warbler	72	38	18	35
	Average number of insects on sticky traps per hour.			
Insect abundance	66	69	77	78

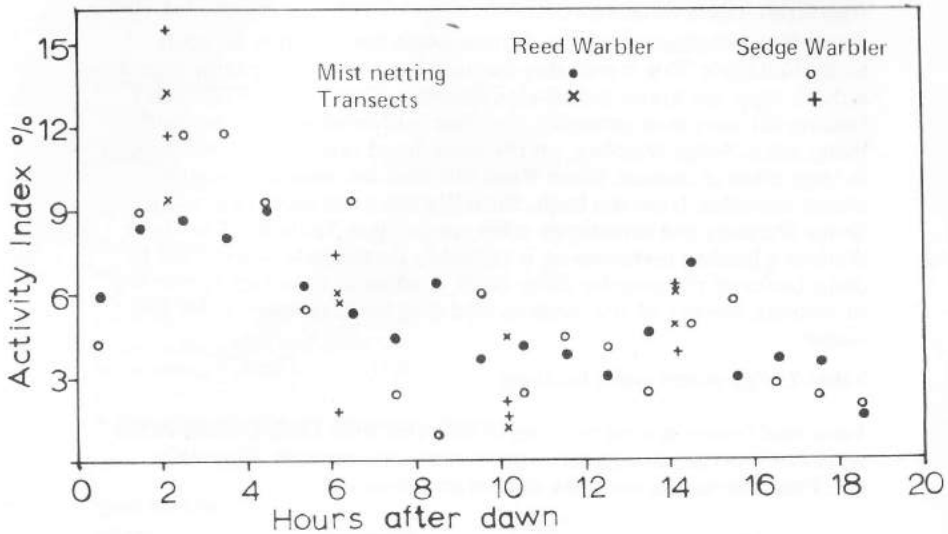


FIGURE 3 Diurnal variation of activity of Reed and Sedge Warblers derived from the catch per unit effort in mist nets and the number seen on fixed transects.

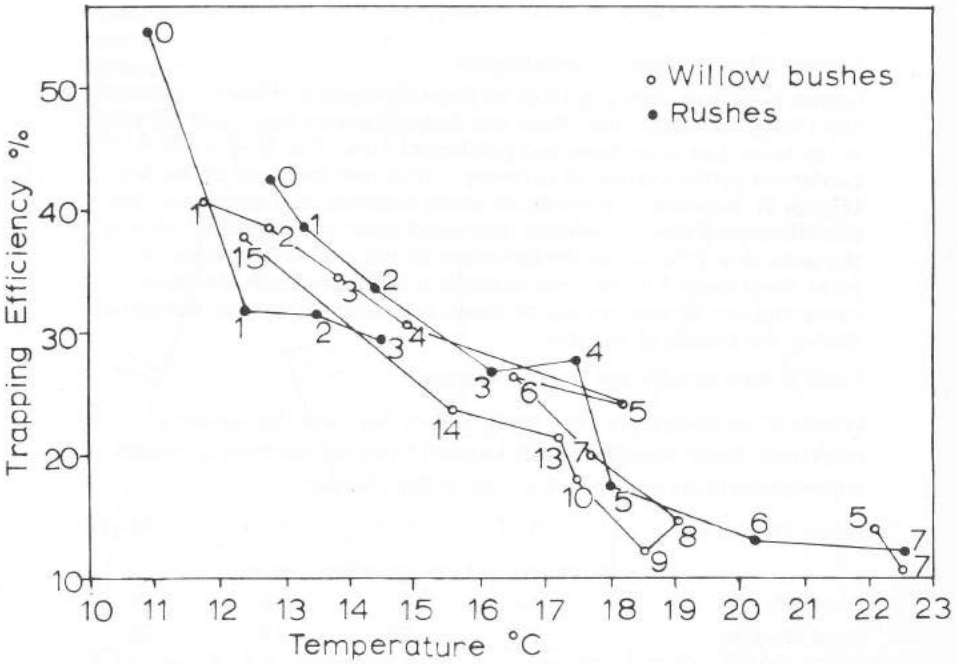


FIGURE 4 Efficiency of human with pooter at catching insects. Trapping efficiency is the percentage of insects approached which were successfully trapped. Numbers refer to hours after dawn.

It has been shown (Lewis and Taylor 1964, Taylor 1963) that flying insects have a threshold temperature below which they will not take off. Figure 4. shows how the ease with which flies can be caught by a human observer, using a mouth operated suction trap (pooter), varies with time of day and temperature. Flies are easier to catch in the cooler parts of the day, i.e. early morning and evening.

Reed Warblers appear to change their hunting strategy with temperature (Figure 5.) increasing the proportion of catching as opposed to picking in their foraging behaviour as the temperature increases. This change of behaviour would be appropriate to the increased activity of the prey. The rate at which Reed Warblers attempt to collect insects increases significantly with temperature while the rate of movement through the bushes appears to remain constant. Thus the number of changes of perch between feeding attempts decreases with increasing temperature (Figure 5.). To the human observer insects are more

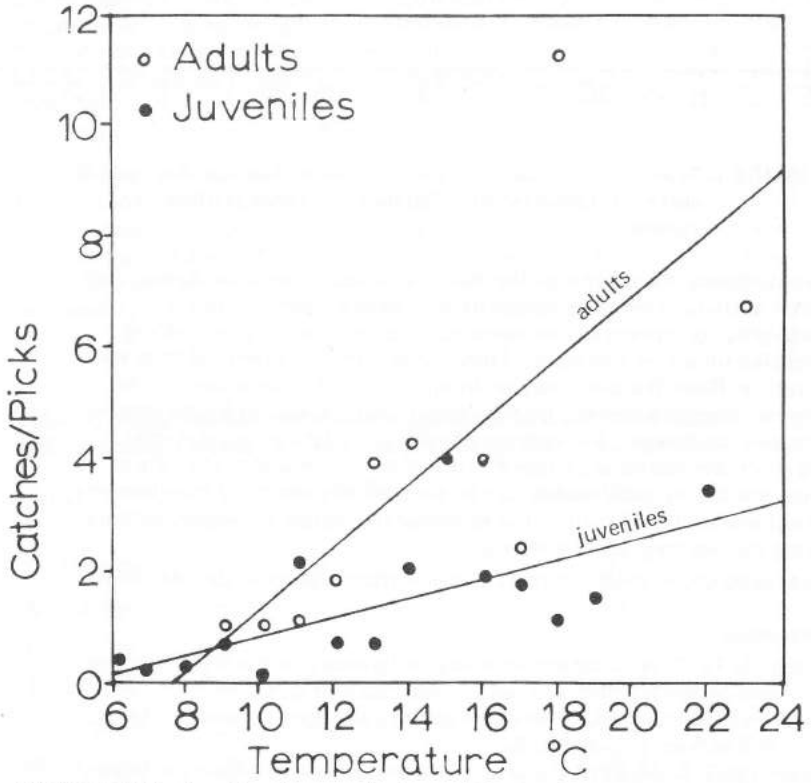


FIGURE 5 Ratio of feeding methods used by Reed Warblers in bushes at different temperatures.

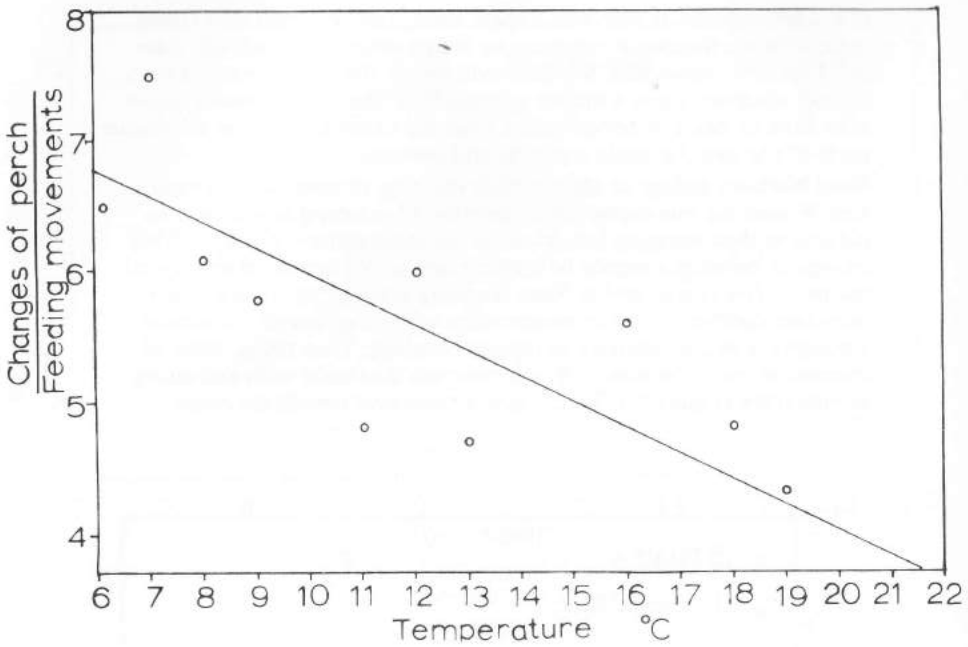


FIGURE 6 Numbers of changes of perch between feeding attempts at different temperatures. Data are for Reed Warblers in bushes.

obvious during the middle of the day than at dawn or dusk due to their greater activity. Therefore the birds may have to search more thoroughly for insects at low temperatures because they are resting concealed on leaves and twigs. These observations suggest that the feeding rate of Reed Warblers may be limited at low temperatures in the early morning and evening by the rate at which they can locate insects concealed on foliage. The capture of prey once located is relatively easy since the insects are sluggish. At higher temperatures the rate at which the highly mobile prey can be successfully captured may become critical and perhaps result in the observed reduction of feeding activity during the warmest part of the day.

These suggestions clearly require confirmation and more detailed work.

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FIVE YEARS DATA ON THE WILLOW WARBLER

Between 1968 and 1972, 653 Willow Warblers have been ringed at Wicken. 93 of these birds have been retrapped on a day other than that on which they were ringed to give a total of 154 rehandlings, 91 in the year of ringing and 63 in subsequent years. No birds have been recovered away from Wicken. This note summarises some of the information provided by the sample. For certain analyses, especially those involving year to year or site to site comparisons, only part of the total information can be used because of changes in catching effort or net sites during the period.

Composition of Catch

At the time of ringing 208 birds have been aged as adults, 358 as juveniles, 73 have not been specifically aged (i.e. Age 2) and 14 have been pulli. The presence of a high proportion of unaged birds in late summer reduces the accuracy of analyses involving this period. Bibby (1969) and Langslow (1971) have shown that adult Willow Warblers may be sexed on the basis of wing - length (Males $>$65mm; Females $<$63mm) and the presence of a brood patch. Applying these criteria to birds ringed as adults, or retrapped as adults having been ringed as juveniles, 137 males and 67 females have been ringed. Nine birds cannot be sexed by this method.

Table 1 indicates, for each half - monthly period from April to September, the presumed sex of all adults handled in that period, also indicated are the mean wing lengths for each period. Males clearly arrive on the Fen before females and outnumber them in the catch in all months save July. The difference in the extent to which the two sexes are caught presumably reflects some difference in their behaviour.

Table 1. Presumed sex and mean winglengths of adult birds caught in half - monthly periods. No bird counted more than once per day.

Period	Presumed Sex			Mean Wing - length mm.
	Male	Female	Unknown	
1 - 15 April	11	0	1	67.75
16 - 30 April	45	9	5	66.58
1 - 15 May	27	14	5	65.15
16 - 31 May	21	14	1	64.41
1 - 15 June	26	16	4	65.15
16 - 30 June	28	14	1	64.91
1 - 15 July	5	9	1	63.56
16 - 31 July	7	9	0	63.25
1 - 15 August	12	3	1	66.00

Passage

Table 1 suggests that males are more numerous on the Fen in April than during other periods of the year. This apparent difference might be explained by a greater mobility of birds in the period before breeding begins or could reflect the presence of passage birds in the spring. The latter suggestion is supported by an analysis of the extent to which adult birds caught during each month are recaught on other occasions during the same year (Table 2). This analysis has to be confined to the Reed Bed area and the years 1970, 71 and 72 as the only situations in which weekly samples from the same area are available.

Table 2. Percentage of adults caught in each month which were caught only once in that year. Captures less than 14 days apart have been considered as one capture.

	April	May	June	July	August
% of birds caught only once	75	57	60	64	50

The high proportion of April birds not handled later in the season is consistent with the existence of a spring passage. The average values hide considerable variation between years.

Seasonal Pattern

Willow Warblers are recorded on the Fen from early April, with the earliest capture on the 12th, but the major influx occurs in late April or early May (Figure 1). Evidence of incubation, in the form of the presence of brood patches, appears from mid-May onwards (17th, 16th, 15th and 17th in 1969 - 72). Although pulli have been ringed on June 3rd, free flying juveniles have not been caught before the second half of June, the earliest date being the 17th.

Moult in adults begins in mid-June and is virtually complete by the end of July. Moult may account for the low numbers of adults caught in July. This hypothesis is supported by the fact that many birds are caught both before and after but not during the moult period. This is indicated in Table 3 where the number of birds assumed to be present during each half - monthly period, because they are caught in in periods each side of that half - month, is expressed as a percentage of the sum of these birds and those actually caught during the period. High values in this table suggest that only a low proportion of the birds present are actually being caught.

Most adults have left or are impossible to age after mid August. A number of juvenile or age 2 birds are recorded in September but numbers fall markedly around the end of August.

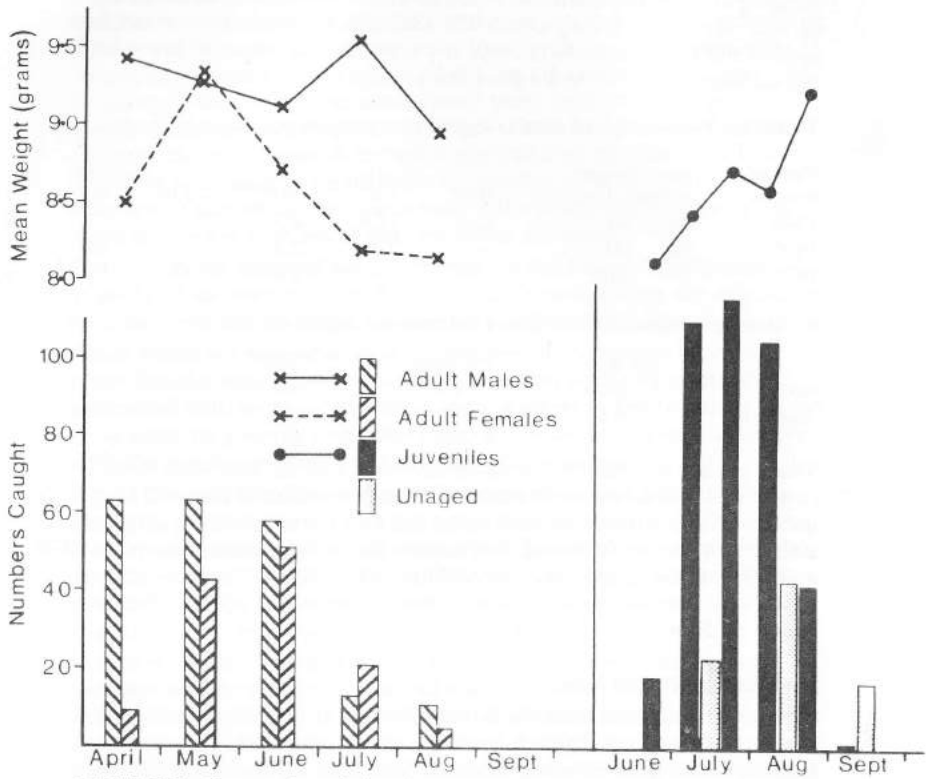


FIGURE 1 Seasonal variation in mean weight and number of handlings, on a monthly basis for adult and unaged birds and half - monthly for juveniles. All captures included.

Table 3. Birds assumed to be present but not caught as a percentage of birds caught plus birds assumed to be present.

	% not caught
April 1 - 15	0
April 16 - 30	1.7
May 1 - 15	14.8
May 16 - 31	33.3
June 1 - 15	23.3
June 16 - 30	27.1
July 1 - 15	44.8
July 16 - 31	33.3
August 1 - 15	0

Survival

Ringing activity has been such that survival calculations can only be carried out for birds ringed in 1969 and subsequently in the Reed Bed area of the Fen. Table 4a records the survival of adults and juveniles in the various years. Table 4b gives the average return rates.

Table 4a. Percentage of birds ringed returning in subsequent years.

Year of Ringing	Nos. Ringed		Adults			Juveniles		
	Adults	Juveniles	1970	1971	1972	1970	1971	1972
1969	23	56	13.0	17.4	4.3	5.4	1.8	0
1970	30	61	–	3.3	3.3	–	4.9	1.6
1971	51	101	–	–	3.3	–	–	4.9

b. Average return rates in years following ringing (%).

	1st year	2nd year	3rd year
Adults	5.3	9.4	4.3
Juveniles	5.0	1.7	0

There is clearly considerable variation from year to year with birds ringed in 1969 surviving better than those ringed in 1970 or 1971. In general the survival rates seem to be too low to maintain the population although it should be noted that certain birds did escape capture in 1970 and 1971 to be caught again in 1971 or 1972. The difference between adults and juvenile survival rates in the first year is much less than that found by Bibby (1971) for the Acrocephalus warblers.

Distribution on the Fen

Mist netting suggests that the Willow Warbler is distributed relatively evenly over the Fen. Table 5 gives the total number of birds caught at two contrasting sites during those weekends in 1970, 71 and 72 when catching took place at both.

Table 5. Numbers of Willow Warblers and Chiffchaffs caught during 16 weekends, 4 each year in 1970, 71 and 72, on which catching took place at the Reed Bed (Site F) and the N.E. corner of the Fen (Site A/B).

		Site A/B	Site F
Footage of net		700	400
Willow Warbler	Adult	48	26
	Juvenile	53	39
Chiffchaff	Adult	22	2
	Juvenile	31	8

Allowing for the footage of net employed the number of adults caught at each site is remarkedly similar. Proportionally more juveniles than adults appear to be caught at Site F, possibly indicating a movement into the area following fledging.

The distribution of the Willow Warbler contrasts markedly with that of the Chiffchaff which clearly prefers the more wooded site A/B. On the Fen the Willow Warbler appears to have a wider habitat tolerance than either the Chiffchaff or the Sylvia warblers studied by Davies *et al.* (1971).

Weight changes

Previous reports in this series have demonstrated both diurnal and seasonal weight change in the Acrocephalus and Sylvia warblers and in finches and also sex differences in various finches. At any particular instant of time the weight of a bird will be a function of a number of variables, which might include: time of year, time of day, age, sex, breeding status, moult status, migration status, food supply, and environmental conditions. A complex analysis and considerable data would be necessary to disentangle all possible effects. In this note attention is centred on certain simple differences and no attempt is made to correct each set of data for other variables.

Figure 1 shows seasonal weight changes in the three major categories of birds which may be identified. For adult birds means are calculated on a monthly basis and for juvenile on a half-monthly basis.

Adult males are heavier than adult females in all months save May when females may be expected to be carrying eggs, this contrast is associated with an apparent fall in male weights as the breeding season progresses. In juvenile birds there appears to be an increase in weight with the passage of time and the approach of migration.

Figure 2 shows the daily pattern of weight change in adult males for April, May and June, samples for other months and for adult females are not adequate to construct other lines. Three hour running means have been used because of the small sample for any one hour and to overcome the considerable variation between adjacent hours which may occur.

No general pattern emerges from this analysis, indeed the contrast between certain months is marked and emphasises the difficulty in attempting to disentangle the effects of different variables. If more data were available it would be tempting to suggest a contrast between the weight changes in April and May and those in June, when young are being fed. In April and May there appear to be periods of rapid weight increase immediately after dawn and immediately before dusk with a plateau between. In June however no significant weight increase appears to occur until around mid-day. In general this analysis confirms the seasonal differences noted earlier in that differences between months tend to persist throughout the day.

Similar plots of weight against time have been made for juveniles on a half-monthly basis. Weights increase unevenly over the day and there is no clear pattern nor any marked seasonal differences.

Daily Activity Pattern

Figure 3 shows the daily activity patterns of adult males, as indicated by the numbers caught in each three hour period from dawn, for April, May, June, To facilitate comparisons the number caught in each three hour period is presented as a percentage of the total numbers caught. No attempt has been made to correct for differences in catching effort. The only general pattern to emerge is the peaks of activity after dawn and before dusk. Juveniles show the same overall pattern.

Certain contrasts emerge from this analysis which may be considered in relation to the daily weight changes illustrated in Figure 2. In April adult males appear to remain active for up to eight hours from dawn

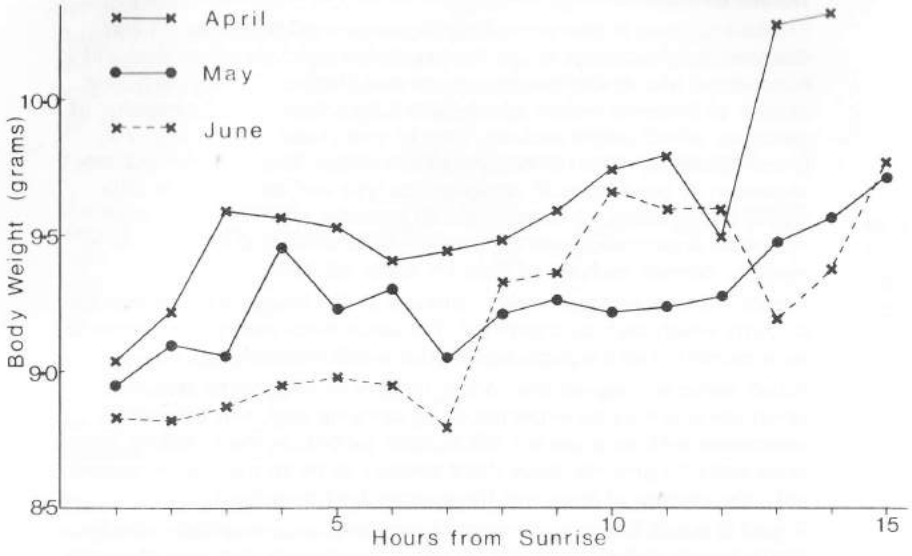


FIGURE 2 Diurnal variation in weight of adult males during April, May and June; three hour running means.

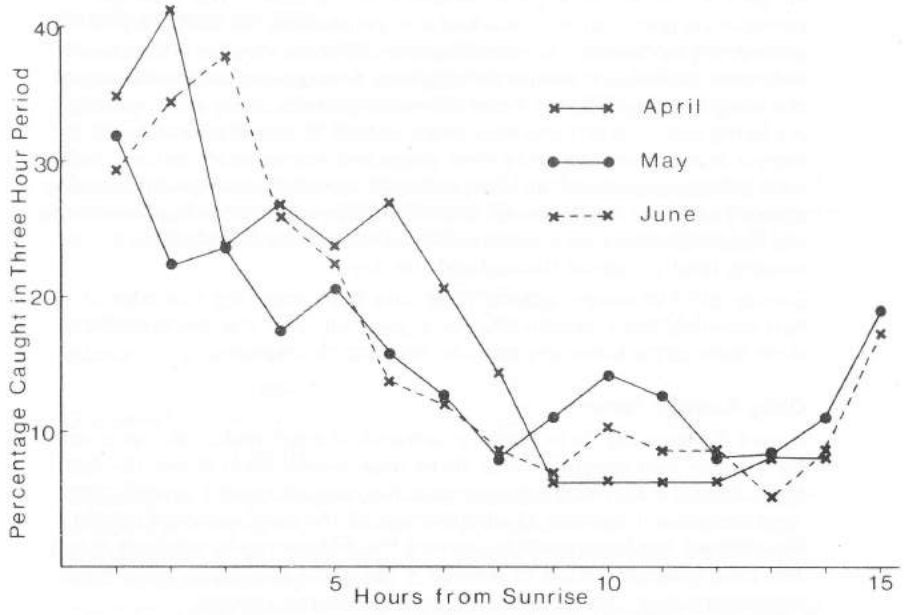
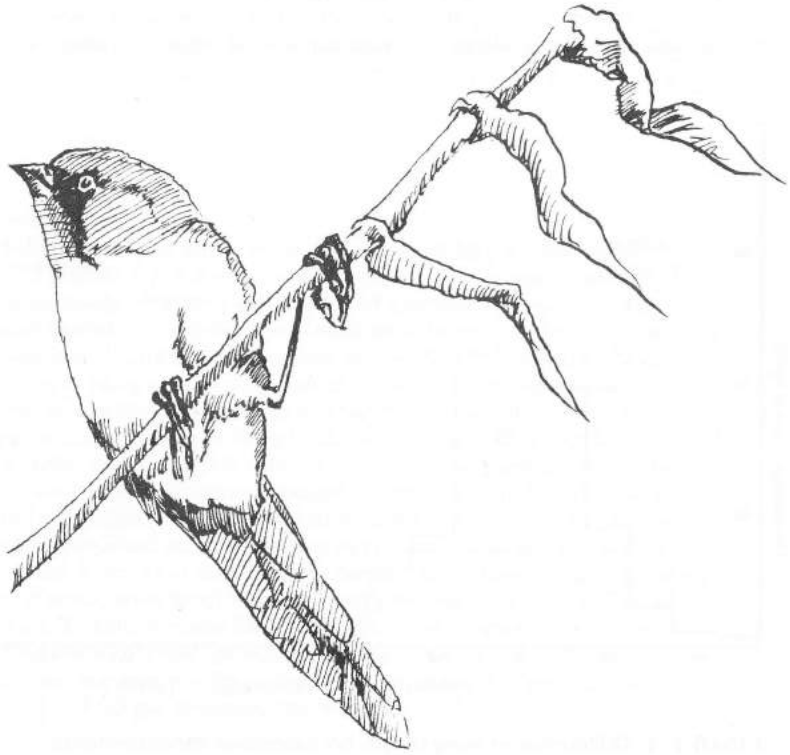


FIGURE 3 Diurnal variation in activity of adult males during April, May and June. Values based on the number of birds caught in three hour periods.

although weight stabilizes after three hours, this activity is possibly associated with territory establishment rather than with feeding. The same tendency is present but less evident in May. In contrast during June the period of greatest activity is not associated with any weight increase and the period of weight increase after mid-day is not reflected by any increase in activity. In this month activity could be a measure of either territory defence or of food collection for nestlings. This contrast emphasises the fact that activity, as indicated by the number of birds caught, may be the result of many different drives which will vary in importance during the course of the year. It may therefore be difficult to interpret activity data save when this is calculated for short time intervals (c.f. Harvey, (1969)).

Summary

This note summarises some of the data so far collected on the Willow Warbler at Wicken. The relative paucity of data for any one category of bird or for any one interval of time is evident and prevents any definite conclusions being drawn. The application of statistical tests might indicate that some of the differences observed are meaningful but such detailed analysis is probably unjustified until more data are available.



SOME NOTES ON WRENS

In the five years from 1968 to 1972, 477 Wrens have been ringed by the Group. 295 retrappings have occurred, bringing the total captures of Wrens to 772. As well as being one of the smallest birds commonly trapped at Wicken, the Wren is perhaps the most difficult to handle – 5% of all birds caught escape before the routine processing is completed. In expectation of a high probability of errors and inconsistencies, it was thought worthwhile to analyse some of the accumulated data on this species.

Variation on wing length

At Wicken any bird is measured by only one person at each capture, so no direct comparison between the measuring technique of different observers is possible. Nisbet et al (1970) have shown that consistent, though small, variation is to be expected. An arbitrary assessment of apparent wing length variation can be made by plotting the differences between successive measurements on the same bird, using all the re-trap data. This would not distinguish between observer inaccuracy and a genuine change in wing length; however, as shown in Fig. 1 the curve takes the form of a rather broad normal distribution, centred on zero change. For comparison, a similar curve for Blue Tits caught and measured by a local two-man ringing partnership shows appreciably less scatter even though Blue Tit wing lengths are 25% greater than Wrens'. It is therefore likely that the multiplicity of measurers, abetted by the writhings of the Wren, results in substantial errors. However, a

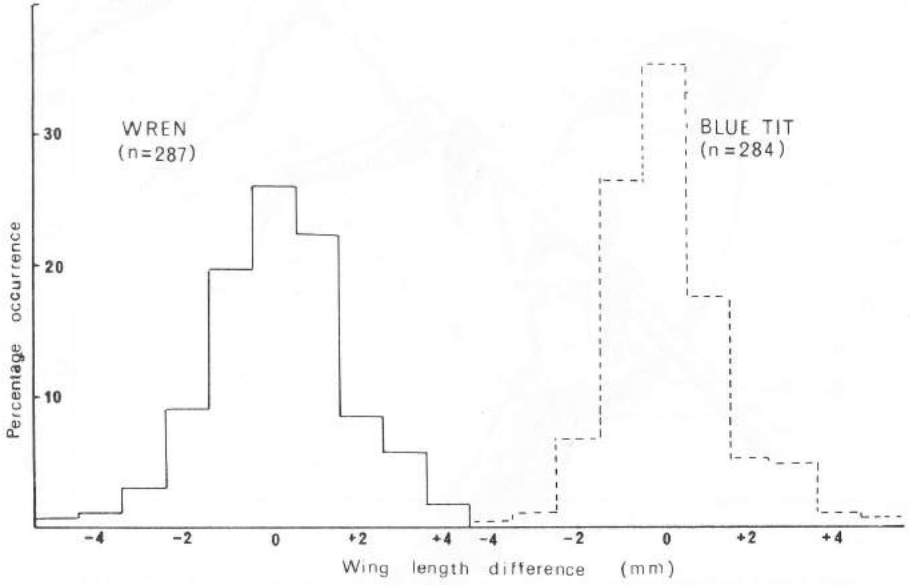


FIGURE 1 Difference in wing length on successive measurements.

study of all Wrens caught at least four times (32 birds) confirms that the mean measurement on the four successive occasions is constant: 48.7 ± 2.2, 48.4 ± 2.3, 48.8 ± 2.0 and 48.7 ± 2.0 mm.

Permissible conclusions are that observer inaccuracy is random throughout the season, and that increases in Wren wing length (by growth)are balanced annually by decreases (by wear). Analysis of wing lengths by months does show a slight indication of an annual cycle (Table 1). Maximum mean wing length seems to be in May, minimum in June. The latter is the month of the first appearance of juvenile Wrens, which might have incompletely grown wings. Post nuptial moult might cause reduced wing length values in July or August. But the differences between months are small, and the data rather inadequate – other causes (e.g. change in the sex ratio of birds caught at different times of year) might apply.

Table 1. Wing lengths of Wrens, all records, by month

Month	Jan-April	May	June	July	Aug	Sept	Oct-Dec.
Sample size	90	72	93	224	142	99	42
Mean wing length (mm)	48.3	48.9	48.0	48.1	48.1	48.2	48.3
S.D.	2.2	2.3	2.2	2.1	2.1	2.1	2.5

Sex differences

Male Wrens have larger wings than do females. Bibby (1969) gave 50.2 ± 1.2 and 47.0 ± 1.6 mm. as the mean values for males and females respectively. Presence or absence of a brood patch in the breeding season seemed to correlate well with wing length as a probable way of sexing live birds. Confirmation of this is provided by the data in Fig. 2, which shows histograms of wing length of adult birds segregated according to whether they had or did not have a brood patch in the breeding season. Birds with brood patches averaged 46.8 mm (sd. 1.7mm) those without averaged 49.6 mm (sd. 1.5 mm). Appropriate theoretical normal distributions are superimposed for comparison. Inspection of the data for the whole Wren population suggests that these mean wing lengths for presumed males and females remain applicable throughout the year, for juvenile as well as adult birds. Thus, allowing appropriately for the variance, wing length can probably be used as an indication of sex. Figure 3, relating mean Wren weights to wing length classes, lends support to the hypothesis of sexing by size. A smaller population of 9.0 – 9.3 gm autumn weight is probably composed of females, the larger 10.3 – 11.0 gm probably the males.

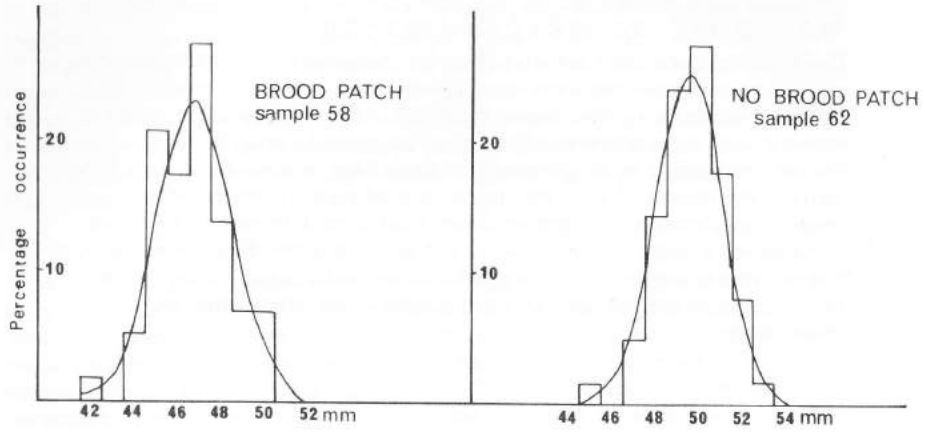


FIGURE 2 Wing lengths of all adult Wrens caught in May, June, or July - each bird counted once only.

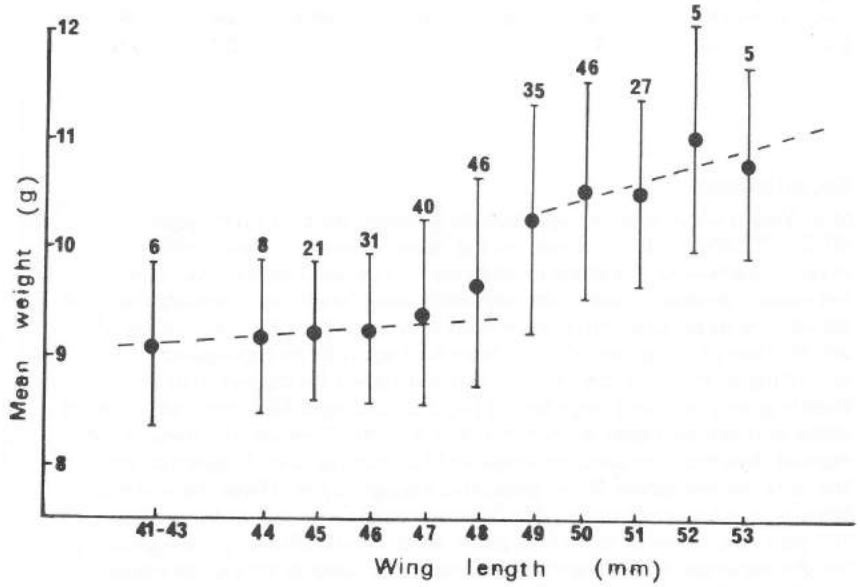


FIGURE 3 Mean weights by wing lengths for all Wrens caught between August and December. Vertical lines are single standard deviations, with the sample sizes shown above. The regression lines are fitted by eye.

Diurnal weight changes

Harvey (1969) showed that Acrocephalus warblers at Wicken lose 0.6 – 0.8 gm in weight overnight during the summer, and correspondingly put on weight during the day. Figure 4 shows a similar situation for Wrens. Wren weights during May, June and July are plotted as three-hour running means against time of day. Wrens of 49 mm or more ("males") are separated from birds of 47 mm or less ("females") but, mainly to increase the sample size, no attempt is made to distinguish birds by age. Males show a fairly steady increase in weight during the day, about 0.8 gm separating evening from morning weight. Females may also increase by 0.8 gm, but their maximum seems to be in early afternoon. Segregation of adults (likely to be involved in breeding) from juveniles, after elimination of birds of doubtful age, leaves this general pattern unchanged. However, Wren catches around midday and early afternoon are much smaller than in morning or evening, so the difference between males and females must at present remain suggestive rather than proven.

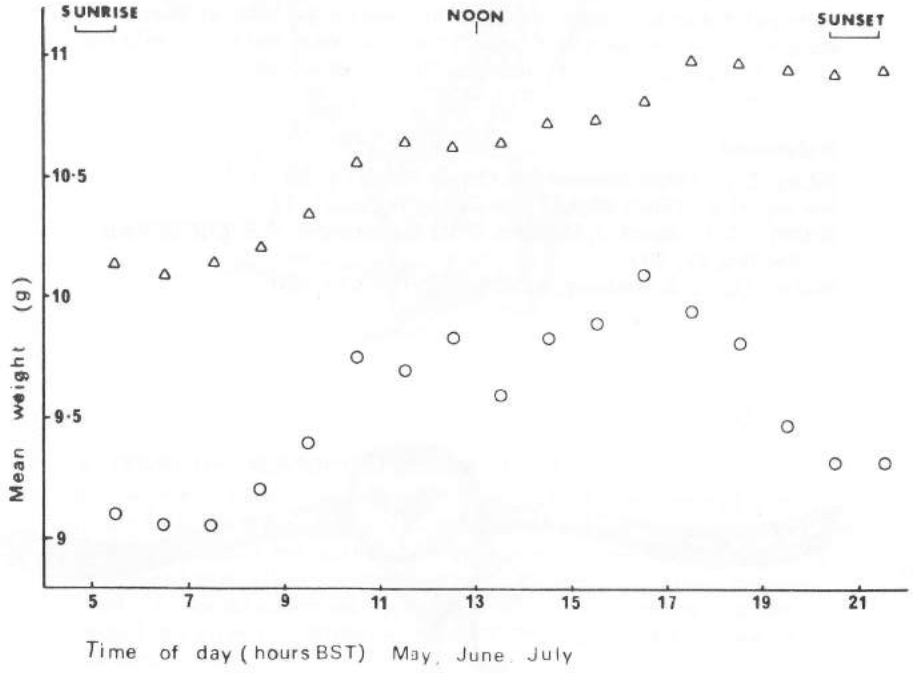


FIGURE 4 Diurnal variation in weight of Wrens in midsummer. Triangles - birds of 49mm wing length or more, circles - birds of 47mm wing length or less.

Consequences of disturbance

Nisbet and Medway (1972) have suggested that intensive netting may cause birds to leave their preferred areas. Using the simplest of their criteria, the rate of subsequent retrapping of Wrens caught twice or more within a single weekend (51%, sample size 45) was compared with that of birds whose first two catchings were spaced over a longer period (39%, sample size 102). One might conclude from this that the netting regime at Wicken is not resulting in Wrens leaving the study area, in contrast to Nisbet's situation at Sungai Way. A similar analysis for other species at Wicken might be worthwhile.

Conclusions

In spite of the intrinsic difficulties and probable errors in measuring, ageing and sexing a species as wily as the Wren, analysis of the Group's collected data (by a member whose knowledge of statistics is limited to a few chapters of the classic Pelican book) can perhaps give indication of features that can only be appreciated when whole populations are studied. Such "results" as are presented are more likelihoods than proven facts, but some might be convertible to the latter by subsequent work.

I am grateful to all Group members (inclusing those who let Wrens escape) for perseverance with such a trying species, and to my wife for help with the Cambridge Elementary Statistical Tables.

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Nisbet, I.C.T.; Baird, J; Howard, D.V. & Anderson, K.S. (1970) Bird Banding 41, 307
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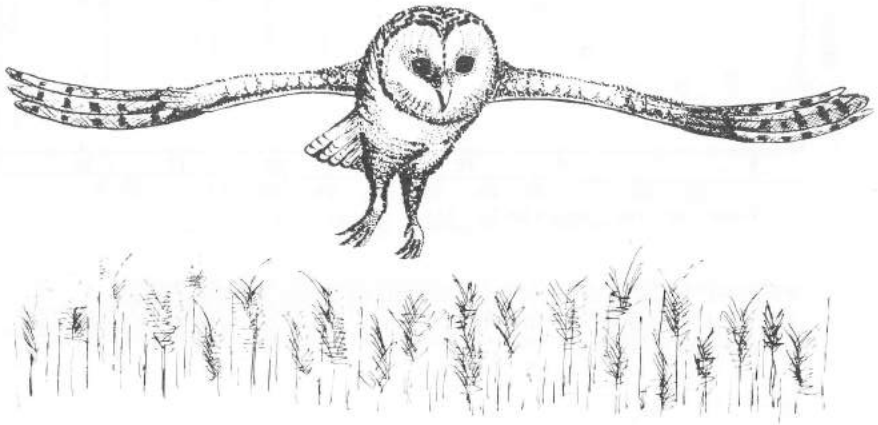

A MEANS OF MEASURING BIRD ACTIVITY

Bird watchers have often noticed that the activities of birds vary with time of day. This has not gone unnoticed by the layman, remember "the early bird catches the worm". However, it is difficult to quantify such changes so as to allow interspecific comparisons and perhaps explanations. This paper examines the ways in which the numbers of birds caught in mist nets at different times of day might relate to their behaviour.

Method

The number of birds caught in a given hour was divided by the total footage of netting deployed during that hour. This statistic is referred to as catchability. The periods considered for each species are indicated below the figure.

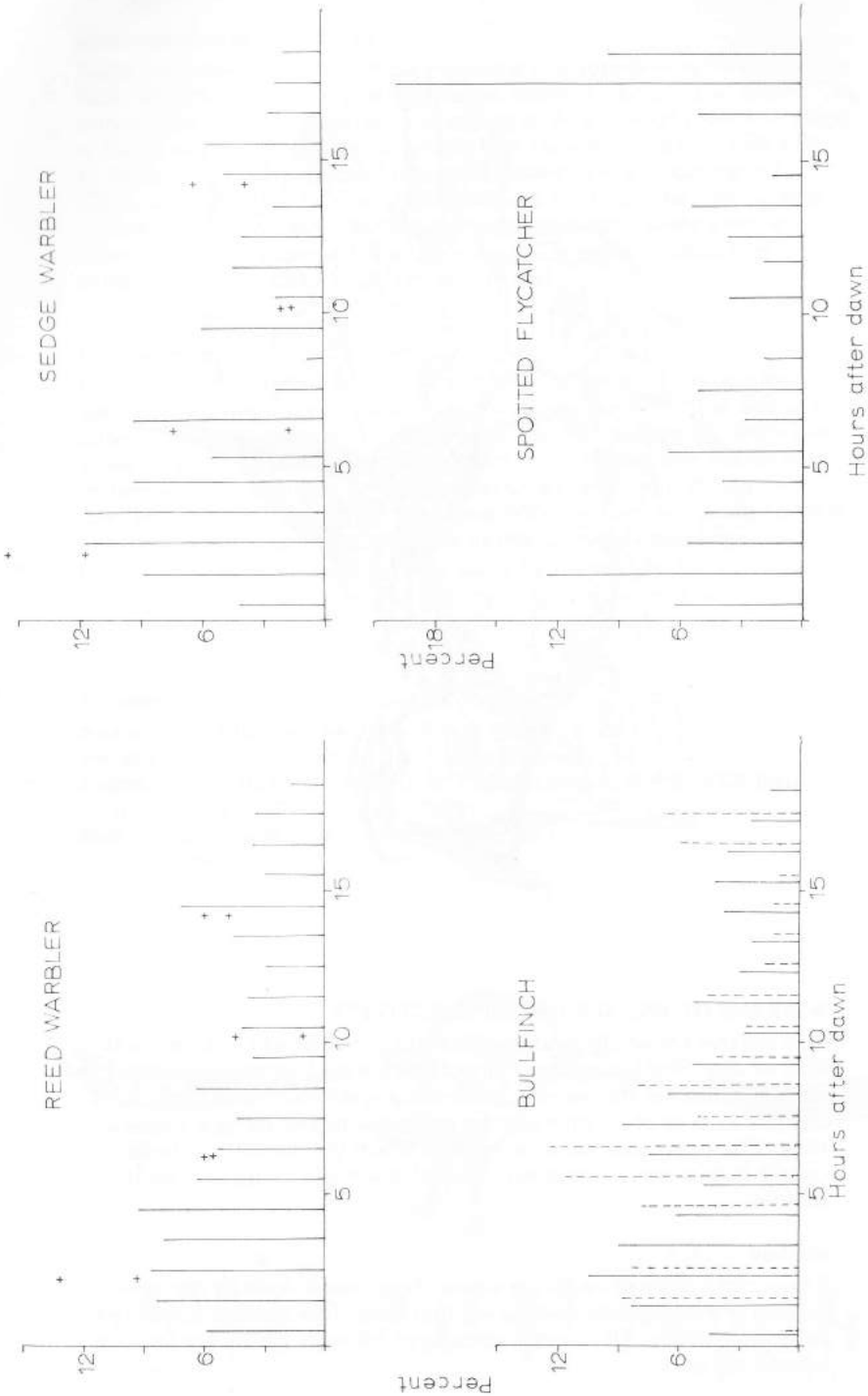

FIGURE Catchability by hour after dawn for Reed and Sedge Warbler adults (with results of counts of foraging birds shown as crosses), Spotted Flycatcher (all ages), and Bullfinch (solid lines–adults, dashed lines–juveniles). Results are for period May to August except for juvenile Bullfinch (July-September). Figures are expressed as percentages.

Results

The results obtained are shown in the figure. The catchability of the species examined is higher in the morning and evening than in the middle of the day. However the duration of these peaks varies from species to species. The morning and evening peaks are very short and marked in the Spotted Flycatcher. The Bullfinch has a more prolonged morning period of high catchability than the other species. There is a suggestion that the morning peak of the Reed Warbler is less marked than that of the Sedge Warbler. The catchability patterns of Reed and Sedge Warblers relate closely to results obtained from counts of foraging birds at different times of day as shown in the figure (these counts are from Davies and Green , elsewhere in the Report).

Discussion

The observed distributions may be due in part to the effects of sampling a finite population of birds. Birds become habituated to the presence of nets after a time and learn to avoid them. The pattern of trapping at Wicken (Friday evening to Sunday morning) is such that these effects might be expected to depress afternoon catchability slightly more than that at other times of day. However this is probably not of major importance.

In most cases it is not known how changes in the birds' behaviour might result in more or less individuals being caught. In a few species the answer is clear, for example, Swallows are mainly caught in the early morning or late evening as they leave or enter their roosts. During the day, they feed mainly above the catching range of the nets which are 3-4 metres in height. On the other hand, the changes in catchability of Reed and Sedge Warblers appear to be closely related to their diurnal pattern of foraging. For other species the explanations are probably more complex. Spotted Flycatchers do not roost communally but, like Swallows, they are caught mainly in the early morning and evening. They are so often observed feeding in the middle of the day that it seems unlikely that reduced catchability is attributable to reduced feeding activity in this case. There may, however, be changes in the vertical distribution of the insect prey which might take the birds out of the range of the nets but this is pure speculation.

While insectivorous birds might be expected to show changes in catchability related to changes in the behaviour or distribution of their prey it is more difficult to imagine any such effects in seed eating birds. However, the Bullfinch, which feeds largely on weed seeds in summer, shows a reduction in catchability in the afternoon. Without other kinds of information interpretation of such a catchability distribution is impossible.

Conclusion

Catchability patterns may be useful measures of feeding activity for species which feed near the ground in the types of habitat in which mist-netting is carried out, however other activities such as roosting, drinking and territorial behaviour complicate the situation in most cases.

DIURNAL AND SEASONAL WEIGHT CHANGES OF THE REDPOLL

Over the past four years, increasing numbers of Redpolls have been caught by the Group. A preliminary weight analysis (1970) showed a marked increase in body weight of females in June and July. The study has been expanded and additional data collected. All birds were sexed with reference to the Svensson guide and in addition the presence of a brood patch was considered to be a property of females alone. All birds were weighed to the nearest 0.1gm on a Pesola spring balance.

Seasonal weight pattern

Birds were caught throughout the summer months in the years 1969-1972. Optimum catching appears to be in May and June with reasonable catches in April and July. Few adults were caught in August and September, and for this reason it is impossible to include these months in the present study. In April and May there is no sign of weight difference but in June and July, females are about 10% heavier and males remain much the same throughout.

Diurnal weight variation

Figure 2 shows the weights of the two sexes at different times of day. Only the months of May and June are considered because of inadequate data at other times. In May the weights of both sexes appear to rise by about a gram in the course of a day. In June however the pattern is different with neither sex showing so much variation, though females might become heavier during the day. An interesting feature of Figure 2 is the difference of activity patterns throughout the day in the two months. In May the catch is greater than in June but notable is the fact that a large proportion of the birds are caught in the first few hours of the day. In June, by contrast, the catching rate is more nearly constant throughout the day. In both months approximately the same numbers of each sex are caught.

Discussion

Weight studies have appeared in previous reports. Messent (1969) found increase in weights of female Reed Buntings and Bullfinches from May to July. Davies *et al* (1971) found signs of female sylvia warblers gaining weight in the breeding season, though for some species the data were hardly enough. The findings of this analysis are pretty much in line with these other studies. As yet it is not possible to know the causes of the weight changes and activity patterns described. Different methods of study are probably necessary to make further progress.

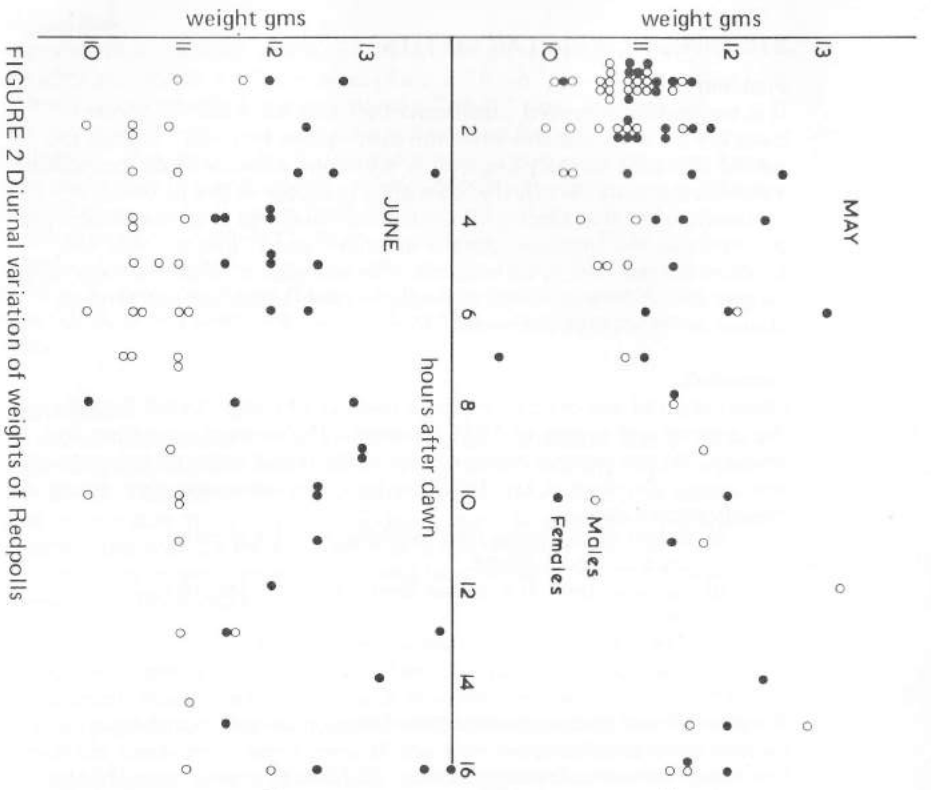

FIGURE 2 Diurnal variation of weights of Redpolls

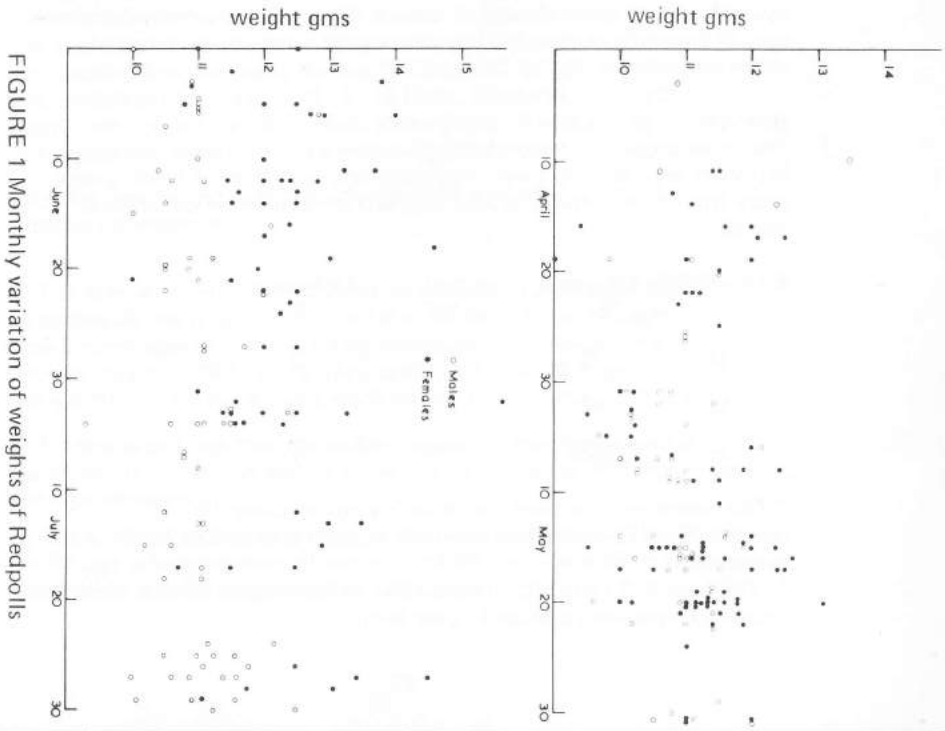

FIGURE 1 Monthly variation of weights of Redpolls

STUDIES OF LONG - TAILED TITS

Problem

It is commonly accepted (Svensson *et al*) that adult and first-year birds are indistinguishable after the post - juvenile moult. During the period late June to early September adult and juvenile birds accomplish a complete moult: the fluffy, chocolate plumage of the juveniles is replaced by distinct black and white head markings and pink feathering on the back; the characteristically juvenile "short" pair of inner tail feathers are the first to be moulted. On the basis of their plumage, birds caught during August, when the moult is well advanced, can only be classed as "2's" (age unknown)

Procedure

Observation of the orbital ring on a number of Long - tailed Tits during the autumn and winter of 1971 revealed differences of colouring and texture. At my request many ringers made verbal notes of the state of eye - rings. On August 1st. 1972 the Secretary asked members to use a classification I devised:

a) Bright pink, fleshy ring, protuberant at top but continuing all round.
b) Notably pink at top, but the lower "lid" shrunken and "dirty".
c) Shrunken all round, pale yellowish - orange at top, dark grey and tightly crinkled below.

Ringers did not always agree in their use of a) and b), but the use of c) showed some unanimity.

Eye - ring descriptions were made for 60 birds (35 birds once, 14 birds twice, 8 birds 3 times, 3 birds 4 times). The codes were correlated with ages of the birds, determined by plumage or from consultation of records of retraps.

Results

The table shows correspondences between eye - ring code and age. Numbers are based on field - examinations,so that some birds appear more than once. Mixed grades (e.g. a/b are entered in columns a) and b).

EYE - RING	1st year "3J"	Adult "4"	Unknown "2"
a)	29	1*	2
b)	47	4**	9
c)	None	15	1

* This seems to have been the ringer's error in using the classification, since the bird was later classed as a) and b) by other ringers.

** Of these 4, 3 were also classed c) by other ringers; records show the fourth to have been a second - year bird.

Conclusions

It appears that the state of the eye - ring changes with age and that a characteristic shrink and fade takes place; a "fresh", young, pink ring contracts to a shrivelled orange and grey "adult" ring. Most of the first - year birds examined showed a progression from a) to b) during the season. Eye -ring codes for the same bird in two separate years have been made only in one instance. A bird (526010) ringed as a juvenile on 29/7/71 (eye - ring a)) was subsequently retrapped three times and finally classed c) on 22/7/72. If the birds ringed during 1972 can be recaptured during the winter and early spring, 1972 - 73, examination of the eye - ring may make it possible to determine a nominal date up to which birds with a pink ring can be identified as born the previous season.

Further work

The social behaviour of Long - tailed Tits is an interesting study. The species is gregarious and not conventionally territorial; the bands which form about midsummer are apparently made up from family groups and seem to be stable in composition (judging from the numbers of fellows retrapped together on separate occasions). A reliable means of distinguishing second - year birds would be a valuable for investigating breeding and flocking behaviour.

Preliminary report on moult

Moult begins about the end of June and is complete about the second week of September. Apparently all feathers are replaced; The order is normal for passerines, beginning with the innermost primaries and moving outwards. Moult of the tail (from the centre) and secondaries (outermost inwards) is delayed for a week or two until the primary growth is somewhat advanced (score of about 11). 55 moulting birds were trapped and retrapped during 1972 and 82 B.T.O moult cards were completed for them. (1971: 19 birds, 20 cards). 15 birds were caught twice during moult; 7 birds three times. The majority of the cards are for juvenile birds

This material has not yet been thoroughly studied; I offer a few tentative observations:

1. The **rate** of moult is remarkably **consistent** in individual birds, and also among all the birds caught, and also for both years. Graphs of primary score against the advancing season gave the mean time to complete moult in 1971 as 75 days, and in 1972 as 76 days. The "average moult" began about a week earlier in 1972 than in 1971.

2. Birds trapped together (probably families) often had a similar state of moult (to within two or three points). The statistics here need careful examination.

3. The 5 adult birds caught early in the moulting season (22/7/72) were further advanced than all except 1 of 48 first - year birds (their average score was 26 as opposed to 19).

BIRD TICKS

Very few ticks have been detected on birds at Wicken Fen, A Bullfinch, a Willow Warbler and two Blackbirds trapped in August and September 1972 were carrying specimens of *Ixodes frontalis;* this is a tick characteristic of resident British birds but not very frequently seen in host populations that have been studied. It is found on ground-feeding birds and is presumably picked up from low vegetation, probably mostly in hedgerows.

The study of another bird tick species, *Ixodes arboricola,* at Madingley in 1971-72 has been more rewarding. This tick is normally found on hole-nesting birds, particularly Blue and Great Tits. The winter ringing programme conducted by members of the Group yielded many birds carrying ticks, the numbers being exceptional, as shown in the Table. This simply records the observation of ticks on the birds, the species of tick being determined on only a proportion randomly removed. It is evident that the number of birds examined of species other than Blue and Great Tits is too small for comment on the incidence of ticks, and likewise the trapping period is too short for comment on seasonal incidence on the two Tits. From other sources, however, it is evident that the tick is most active in autumn and winter. *I. frontalis* was the tick species found on the Goldcrest, and was also found (as a larva) on one of the October Great Tits. With these two exceptions, all ticks examined were *I. arboricola.* The most numerous tick stages seen were the larvae and nymphae, and these were present throughout the season. Adult ticks were less frequent, and seen mainly in the later months.

In an attempt to follow the life cycle of the tick, 27 nest boxes were erected in the Madingley Estate in January 1972 and 15 subsequently had Tit nests and young in May. None of the nestlings was infested with ticks. This might be because the boxes themselves had not had time to become infested, but on the other hand, *I. arboricola* has never been recorded from nestlings and is probably inactive at that season. Nest material from three boxes was examined in September 1972, and one nest contained two adult ticks. This shows that some infestation of boxes had already taken place, from occupation of the boxes in late winter or early spring when ticks were still present on adult birds.

Further examination of nest box material will be made in winter 1972/3 to determine the stage of development of the ticks and the timing of moulting and egg laying. A more detailed laboratory study of the physiology and pathogenesis of *I. arboricola* has been initiated by attempts to rear it on nestling domestic pigeons; this host was selected for ease of maintenance and year-round availability. Early trials indicate however that *I. arboricola* does not feed readily on the pigeon.

Birds carrying ticks, Madingley Hall, Winter 1971-72

The numerator is the number of birds having ticks, the denominator the number of birds examined.

Bird	October	November	December	January	Total
Great Tit	7/12	31/64	4/24	9/30	51/130
Blue Tit	8/25	23/77	10/98	11/95	52/295
Coal Tit	0/1	0/2	0/3	0/3	0/9
Tree Creeper	0/0	0/1	0/0	0/0	0/1
Wren	0/4	0/1	0/3	0/0	0/8
Blackbird	0/2	0/3	0/5	0/0	0/10
Robin	0/5	0/4	0/2	0/3	0/14
Goldcrest	0/0	0/0	1/3	0/0	1/3
Bullfinch	1/8	0/3	0/6	0/2	1/19
Tree Sparrow	0/1	0/0	0/2	0/0	0/3
Total	16/58	54/155	15/146	20/133	105/492

TREE CREEPER MEASUREMENTS

During 1972, several of the Tree Creepers caught at Wicken Fen had their bills and hind-claws measured in view of the recent suggestion that the very similar Short-toed Tree Creeper breeds in the British Isles. It is only possible to separate the two species by measurement or voice.

Some of the bill measurements were taken from the tip of the bill to the feathers, so had to be rejected as measurements to the skull are required. A few of the measurements were taken with vernier callipers, accurate to a tenth of a millimetre but most were taken with dividers to the nearest millimetre.

Svensson gives the following measurements of the two species.

	Tree Creeper	Short-toed Tree Creeper
Hind claw	8.1–11.5mm	7.1–8.7mm
Bill (to skull)	14.0–19.3mm	16.5–21.8mm
Ratio (percentage)	47.7–65.8	36.6–45.4mm

It is fairly apparent from these figures that the separation is small, so measurements have to be fairly accurate to have any chance of establishing the identity of an individual bird. The figures collected at Wicken in 1972 are set out in the table below.

Claw length	Bill length	Ratio
8.8	19	46.3
*9	19	47.4
9	19	47.4
8	16	50.0
10	19	52.6
7.5	14	53.6
*10.2	18.8	54.3
10	18	55.5
10	17.5	57.1
9	15	60.0

A regretable feature of these data is their inaccuracy – the asterisked figures refer to the same individual. Nonetheless, only the smallest actually falls clearly outside the range of measurements of the Tree Creeper (and the Short-toed Tree Creeper too.). In conclusion it can be said that there is no evidence of the presence of Short-toed Tree Creepers at Wicken! For future years, it is hoped that measurements will be taken with care and vernier callipers.

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