THE ANALYSIS OF RINGING AND RETRAP DATA

By: S.E.Piper,
P.O.Box 309,
HONEYDEW,
Transvaal.

Introduction

For most amateur ringers, bird-ringing is an enjoyable and often time-consuming hobby. With the advent of the Project system, the analysis of data has become more important. But few ringers have the know-how to work up some of the aspects of their studies. This article begins a series on how to analyse capture/recapture data. By way of an example, I will examine the W.B.C. ringing group (leader A.D.S.Hewitt) data on the African Marsh Warbler _Acrocephalus baeticatus_ (R.606). In so doing I hope to illustrate how exiting results can be obtained (without the help of a computer!).

Method and Results

The African Marsh Warbler is an intra-African migrant. A bird that is caught a second time in the _same_ season is termed a recapture while a bird caught after having completed its migration is called a control. With the new system of recording retraps, on N.U.B.R.A. blue schedules, when making a retrap you will check your records to find out when the bird was first ringed. This will at once tell you whether the bird should be classified as a control or a retrap. By scaning your blue sheets you will be able to see how many times your retrap has been caught before. The type of results you can expect are shown for one bird 601-81740. If you look closely you will notice an exciting fact about this bird.

R.606 African Marsh Warbler Ring no. 601-81740

Original details: Ringed 27.09.64 Adult Melrose Dam 26.08S
28.04E (M.L.Poval)

Retraps:			
14.12.65	Ad.		(R.Randall)
07.11.71	Ad.	11g (weight)	(A.Hewitt)
19.03.72	Ad.	11.5g	(Hewitt & Piper)
01.10.72	Ad	- 61mm(wing),13(cul)	
		22(ts) and 52(tl)	(" ")
26.11.72	Ad	10.5 62w, 12c, 19ts,52tl	(" ")
28.01.73	Ad	10.0 60w, 14c, 22ts,50tl	(" ")

The basic capture/recapture statistics have been set out in Table 1. At each catching session, the number of birds ringed the number of recaptures and the number of new controls (i.e. birds controlled for the first time that season) are recorded. The data are also added into accumulated totals.

At the end of the season the data can be presented graphically as shown in Fig.1. Here the percentage of new birds ringed in each catch has been calculated for the ringing sessions divided into groups of four. The percentage of new controls has been worked out in the same way. The percentages are then plotted out.

The data can also be looked at in a third way and this is to construct a capture frequency table. The number of times an individual bird is caught is totalled and presented as in Table 2. I have included only birds caught for the first time

	Date	Ringed	Recaptures	New Controls	Total Caught	Accumulated			
						Ringed	New con	Recaps.	Total
1	3.9.72	0	0	2	2	0	2	0	2
2	24.9.72	1	0	0	1	1	2	0	3
3	1.10.72	0	0	3	3	1	5	0	6
4	8.10.72	1	2	2	5	2	7	2	11
5	10.10.72	2	0	0	2	4	7	2	13
6	15.10.72	1	2	1	4	5	8	4	17
7	22.10.72	2	1	0	3	7	8	5	20
8	29.10.72	0	0	2	2	7	10	5	22
9	5.11.72	0	1	0	1	7	10	6	23
10	19.11.72	0	0	1	1	7	11	6	24
11	26.11.72	0	2	2	4	7	13	8	28
12	3.12.72	1	2	3	6	8	16	10	34
13	10.12.72	2	3	0	5	10	16	13	39
14	29.12.72	3	2	0	5	13	16	15	44
15	31.12.72	2	2	0	4	15	16	17	48
16	7.1.73	3	1	0	4	18	16	18	52
17	14.1.73	0	3	0	3	18	16	21	55
18	21.1.73	0	1	0	1	18	16	22	56
19	28.1.73	2	1	2	5	20	18	23	61
20	4.2.73	1	3	1	5	21	19	26	66
21	11.2.73	1	2	2	5	22	21	28	71
22	25.2.73	1	0	0	1	23	21	28	72
23	18.3.73	1	0	1	2	24	22	28	74
24	24.3.73	0	2	0	2	24	22	30	76
25	6.4.73	1	0	0	1	25	22	30	77
	TOTALS:	25	30	22					

TABLE 1 - AFRICAN MARSH WARBLER CAPTURES 1972/73 SEASON

TABLE 2 Frequency of Capture of African Marsh Warblers in
the 1972/73 Season

Number of Times Caught	No. of birds	%
1	29	61.70
2	11	23.40
3	4	8.51
4	2	4.26
5	1	2.13

Fig.2 shows the percentage of accumulated new rings in the
total accumulated catch, and the percentage of accumulated new
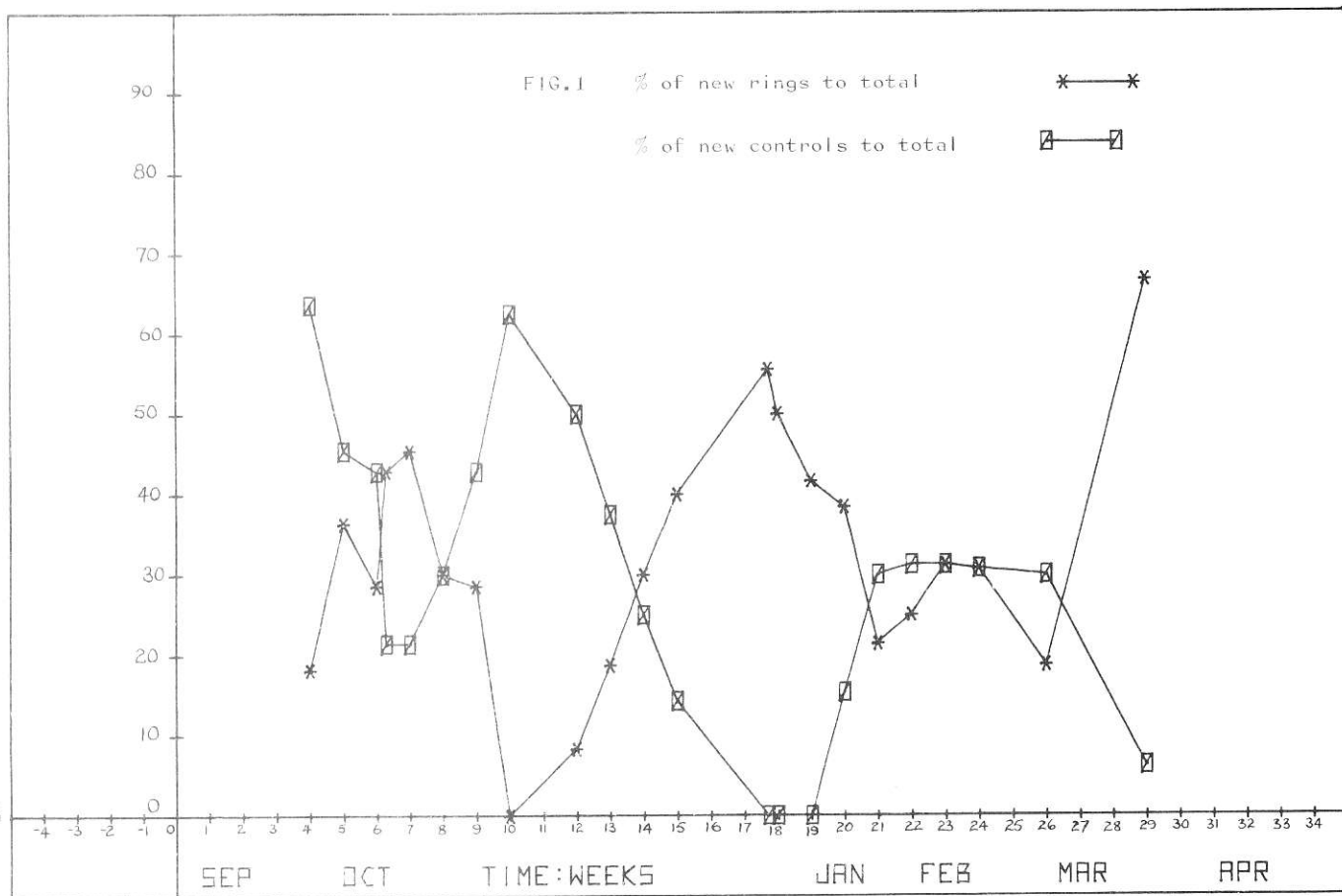controls per total accumulated catch.

in that season, so that the maximum number of retraps of one
individual is five.   The percentage is then given and a cap-
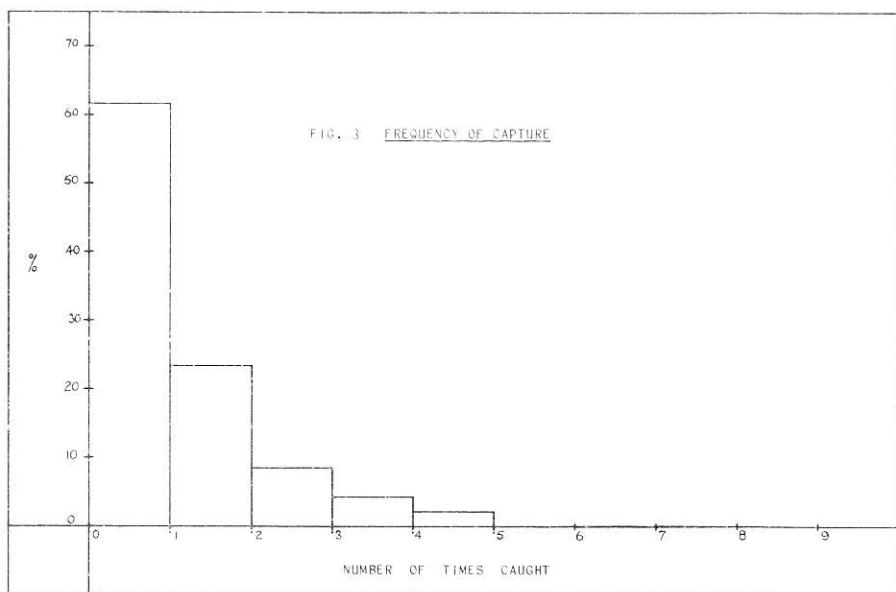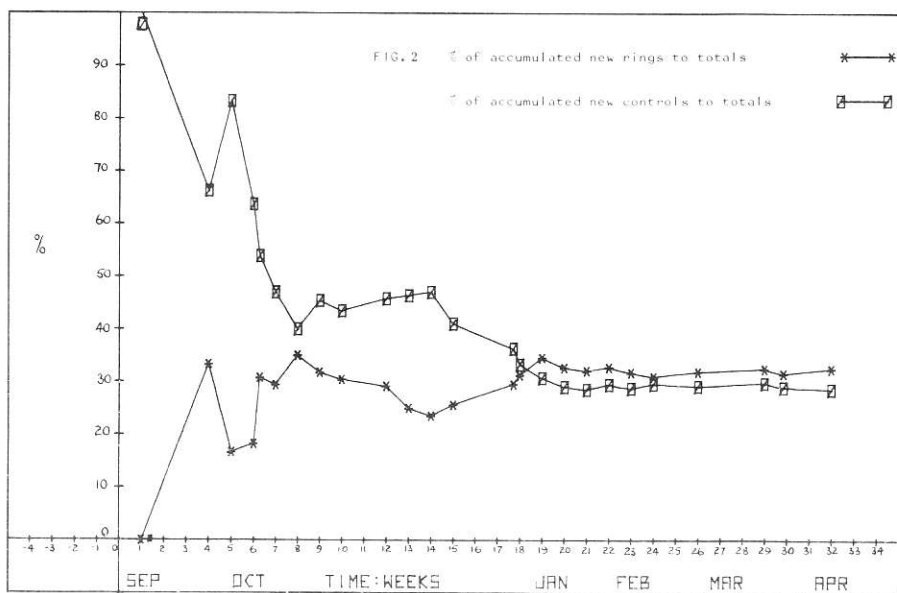ture frequency histogram is drawn as shown in Fig.3.

Interpretation

    If you look at Fig.1, you will see that the percentage of
new rings in the total catch shows three peaks (mid-October,
January and April).   The species is with us from late August
until April, as shown.   At the start of summer, there is an
influx of full-grown returning migrants, some of which are un-
ringed.   The first peak may represent the ringing of those
birds.   The drop in November suggests that by then most of
these birds have been ringed.   Alternatively it could be
argued that the first peak is due to a southward passage of
birds.   The April peak could be due to a return northward
movement.   On the other hand the breeding season in the Trans-
vaal is from November to February.   If the bulk of birds fledge
towards the end of the year they may cause the second peak.
Can it be that the third peak is due to a small number of second
clutches?

    The curve of the percentage of new controls (also Fig.1)
shows a similar pattern.   The main difference is the lack of
new controls early in the new year.   Similar explanations are
offered for the October and February/April highs.

    The frequency of recapture is shown in Table 2 and Fig.3.
For those who have analysed other passerine data it will be
obvious that we have a very high recapture rate.   Thus we can
conclude that we have been capturing a fair proportion of the
total population.   The ratios of accumulated new controls and
accumulated new rings to total accumulated catch, level out at
29% and 39% respectively.   The total of these two is 67.5%.
Thus as a very crude estimate we may guess the population size
is 100/67.5 times bigger than the total number of birds hand-
led i.e. 52 x 100/67.5 = 77.

FIG.1   % of new rings to total   *——*

         % of new controls to total   ▨——▨

TIME:WEEKS

SEP   OCT   JAN   FEB   MAR   APR

FIG. 2   % of accumulated new rings to totals   ✳——✳

% of accumulated new controls to totals   ▱——▱

FIG. 3   FREQUENCY OF CAPTURE

Further comments on these figures will be made in Part 2.

16