

RELATIVE ABUNDANCE AND SEX RATIOS OF WARBLERS*

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INDICES to song bird populations can be obtained from the records compiled by bird banding stations. An especially good opportunity is offered by migrating warblers that have to pass through a banding station's territory to reach their nesting grounds.

A line of traps in operation can be compared to a seine being swept through a lake, the only difference being that the birds are mobile, the traps immobile; whereas the fish are immobile in a general sense, the net mobile. Both mechanisms catch a sample of the population present. There are, of course, inherent limitations in both these sampling techniques, but they have value when their limitations are taken into consideration. Seining of ponds is an accepted technique of sampling fish populations.

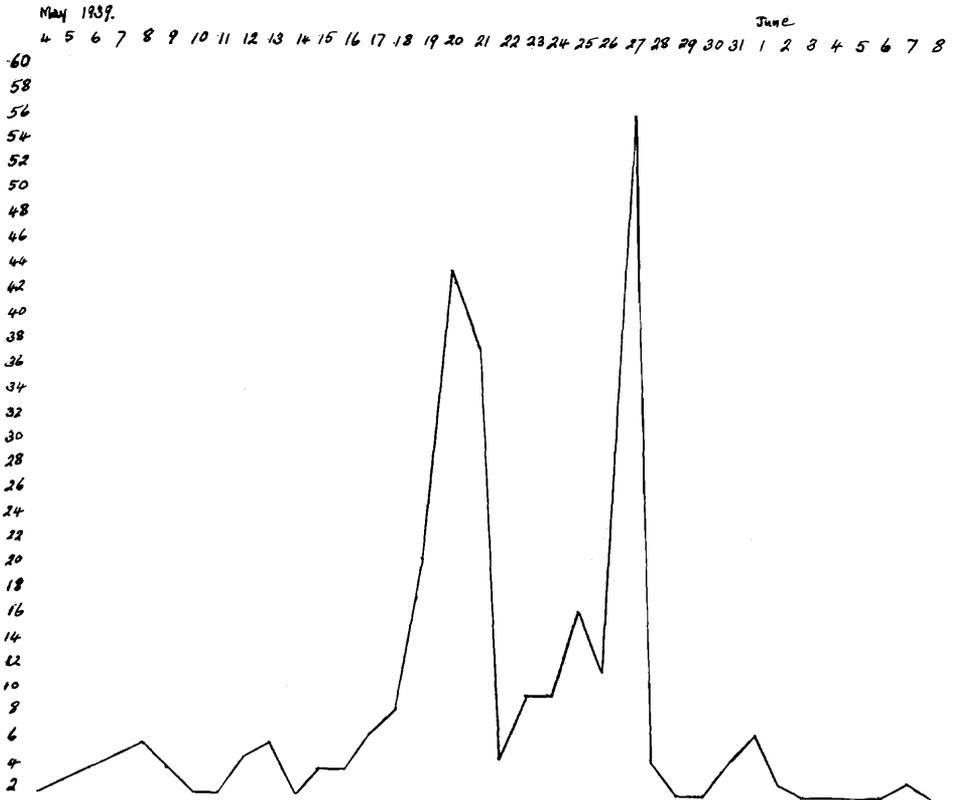
As an example of the way indices of abundance and sex ratios can be obtained from bird banding records, the results of trapping operations at the Wharton Bird Banding Station, Groton, Massachusetts, during the period May 5 to June 7, 1939, as applied to the Wood Warblers (*Compsothlypidae*), are here presented:

Charting on the graph the totals of birds banded, we find that two main warbler movements occurred, and that the movement culminating on May 20 stayed for a longer period in the area than did the one reaching its peak on May 27. Table I shows that the greatest number of species were present in the period May 19 to May 27, and that never more than 13 were trapped on any one day. During the same period 196 warblers were banded—80% of the total. The abruptness of the exodus of warblers from the area is shown clearly in both Table I, and the graph. After May 27, only 13 individuals of 4 species were taken. It should be noted that the species listed in Table I, are in the order of their first appearance.

Griscom (1939), in his notes for the Boston Region covering the 1939 spring movement, writes: "On May 18 . . . a great wave rolled in, with birds in . . . great variety and abundance. . . . Another wave on May 20 . . . can only be described as prodigious and spectacular. . . . From then on birds remained common until May 27. . . ." Comparing these notes with the data from Table I presented in the graph, we find a gratifying correlation.

Table II gives specific and sex ratios. While we find that out of the 217 birds sexed, 118 were males and 99 females, perhaps not too unbalanced a ratio, we do find a greater divergence for some species.

*A contribution from the Wharton Bird Banding Station.



WARBLER MIGRATION AS SHOWN BY THE NUMBER BANDED
WHARTON STATION, GROTON, MASSACHUSETTS
SPRING 1939

Braun (1935), in his excellent study of warbler migration at Canton, Ohio, had an even more balanced sex ratio. Citing the figures for 1933-34, he banded 165 males to 161 females. In 1939 (correspondence) he obtained a more unbalanced ratio during the period April 25-May 27, obtaining 201 males to only 149 females.

THE 1940 SPRING MIGRATION

Compiling the data from the trapping records for the spring of 1940 along the same lines, we find they are obviously too few to be of much value. The reason so few warblers were taken is that a

great deal of precipitation occurred which coincided with the main warbler movements. Shimmering water in a trap cannot compete with pouring rain and dripping foliage. Conditions of this kind are comparable to a hole in the seine, and can be expected to occur at individual stations periodically.

TABLE NO. II
SEX RATIO OF WARBLERS BANDED AT GROTON, MASSACHUSETTS
SPRING 1939

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Black and White	—	—	2†
Tennessee	2	2	4†
Orange-crowned	—	—	1†
Nashville	—	—	22†
N. Parula	11	14	25
E. Yellow	0	2	2
Magnolia	23	15*	39‡
Cape May	1	0	1
Black-throated Blue	3	6	9
Myrtle	0	1	1
Black-throated Green	3	3	6
Blackburnian	0	3	3
Chestnut-sided	8	4	12
Bay-breasted	0	1	2‡
Blackpoll	27	22	49
Pine	0	1	1
Yellow Palm	1	0	1
Mourning	1	0	1
Northern Yellow-throat	6	10	16
Wilson's	8	1*	9
Canada	11	9	20
American Redstart	13	5	18
22 Species	118	99	244

TABLE NO. IV
SEX RATIO OF WARBLERS BANDED AT GROTON, MASSACHUSETTS
SPRING 1940

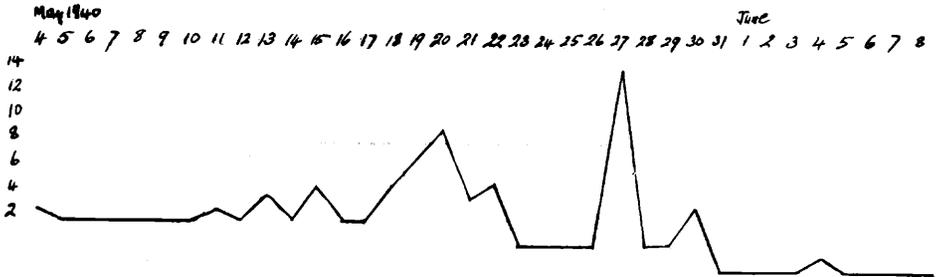
	<i>Male</i>	<i>Female</i>	<i>Total</i>
Black and White	—	—	1†
Nashville	—	—	4†
N. Parula	2	0	2
E. Yellow	1	1	2
Magnolia	4	3	7
Cape May	0	1	1
Black-throated Blue	2	2	4
Black-throated Green	1	0	1
Blackpoll	3	1	4
Yellow Palm	1	0	1
N. Yellow-throat	4	1	5
Wilson's	—	—	1‡
Canada	2	2	4
American Redstart	1	5	6
14 Species	21	16	43

†Determinations too indefinite.

* Includes one questionable determination.

‡ Includes one undetermined.

The data being so few, comparisons would be worth little. It is, however, a remarkable coincidence that again in 1940 peaks of abundance were reached on precisely the same dates as in the previous year, *i.e.*, May 20 and 27. Braun (1935) found in his two-year study a similar tendency.



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Only from a long series of reports as the ones presented and referred to here could worthwhile comparisons and conclusions be attempted. The material is not difficult to assemble. It can be taken by banders with ease and dispatch from the Fish & Wildlife Service Schedules before these are sent to Washington.

By restricting the studies to the spring migration, the information obtained would give an insight to the status of the family as a breeding population. In most species the sexes can be differentiated. There would be no confusion from the inclusion of immature birds. In general, residents would also be excluded: A sampling of the warbler population as it swept up the country to its breeding grounds would be obtained.

Reports from banding stations located at various points along the flyways would build up in time a valuable mass of data. A uniform method of presentation would vastly increase their usefulness. Reports from such a chain of stations would throw important light on relative abundance between specific members of the family; variables in the abundance of species from year to year; variables in sex ratios.

Because of the importance of the sex ratio factor in the status of a species, this branch of ornithological research is deserving of more attention. Banders are in a particularly good position to make valuable contributions.

LITERATURE CITED

- GRISCOM, LUDLOW. 1939. The Season, *Bird-Lore*, XLI, (4) : 251.
 BRAUN, HOWARD W. 1935. Studies of warbler migration near Canton, Ohio, *Bird Banding*, VI, (3) : 81-89.
 Wharton Bird Banding Station, Groton, Mass.