

A COÖPERATIVE STUDY OF THE  
WHITE-THROATED SPARROW

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## INTRODUCTION

IN the fall of 1943, the Eastern Bird Banding Association undertook a study of the White-throated Sparrow, *Zonotrichia albicollis* (Gmel.), based on the data of its members and later from other banders who wished to coöperate. The October and November, 1943, issues of EBBA News, the Association's monthly news-letter, outlined some of the results of this investigation, but the large volume of data submitted indicated that a more detailed study and report were desirable.

Reports were received on 43,000 birds banded by 52 persons. Invaluable assistance was received also from F. C. Lincoln and Chandler S. Robbins of the U. S. Fish and Wildlife Service. To them and to all who sent in their records and comments, the Eastern Bird Banding Association extends its thanks. The authors are indebted to J. T. Nichols for his reviewing of the manuscript, and to Dr. Harold B. Wood, President of the Association, who also read the paper and assisted in tabulating the data. For the critical reading and suggestions by Prof. O. A. Stevens, Secretary of the Inland Bird Banding Association, the authors wish to express their deep appreciation.

## THE NUMBERS BANDED

Among the Passeres, more Juncos, *Junco h. hyemalis* (Linn.), are banded each year than any other species; the White-throated Sparrow is a close second. Before 1924, 3,975 White-throated Sparrows had been banded. From 1924 through June, 1943, the number amounted to 223,369. The annual total of these birds banded varies between 8,000 and 20,000. The species is an abundant migrant, especially along the Atlantic Coast and the Mississippi River flyways.

The White-throated Sparrow is not a shy bird during its wintering and migratory seasons and is readily taken in a variety of traps baited with small grains, white bread, water, etc. Wintering birds often develop the 'trap habit' to an extent that they become an annoyance. Dr. C. Brooke Worth of Swarthmore, Pennsylvania, tells of removing one of these persistent repeaters from a trap. Standing with his legs straddling the trap, he threw the bird as high in the air as he could. The bird described a simple arc back to earth and reentered the trap between his legs. B. S. Bowdish of Demarest, New Jersey, records a White-throated Sparrow repeating 271 times in a single winter.

TABLE 1  
CONTRIBUTING BANDERS AND GENERAL DATA

<i>Bander</i>	<i>Location (north to south)</i>	<i>Years of banding</i>	<i>Total banded</i>	<i>Returns</i>	<i>Recov- eries</i>
Will O. Astle	New Brunswick, Can.	5 summers	189	4	0
Prof. Ralph DeLury	Ottawa, Canada	22	800	1	1
Prof. O. A. Stevens	Fargo, N. D.	18	3096	0	3
G. Hapgood Parks	Millbridge, Me.	6 summers	26	3	0
Mrs. J. F. Anthony	Bar Harbor, Me.	14	200	0	0
Mrs. C. E. Peterson	Madison, Minn.	10	636	0	1
Howard H. Krug	Chesley, Canada	10½	51	0	0
Clarence A. Searle	Wisconsin Rapids, Wis.	3	72	0	0
Mrs. M. T. Maxon	Milton, Wis.	7	467	0	0
C. C. Ludwig	Lansing, Mich.	17	2573	0	1
Malcolm Lerch	Penn Yan, N. Y.	6	188	0	0
Verdi Burtch	Branchport, N. Y.	21	802	0	1
Samuel D. Robbins	Belmont, Mass.	7	118	0	0
H. E. McArthur	Waukegan, Ill.	13	2270	0	0
Daniel Smiley, Jr.	Mohonk Lake, N. Y.	3 years and 3 springs	770	0	3
G. Hapgood Parks	Hartford, Conn.	6	208	0	0
Karl E. Bartel	Blue Island, Ill.	10	3627	0	4
F. C. Labahn, Jr.	Blue Island, Ill.	11	3514	0	2
Raymond T. Fuller	Winterton, N. Y.	4	137	0	0
P. H. Oppmann	Lakewood, Ohio	6½	238	0	0
Vernon C. Rossman	Kankakee, Ill.	11	3036	1	2
Rev. J. H. Baeckle	Collegeville, Ind.	2½	814	0	0
George Dock, Jr.	Scarsdale, N. Y.	4½	383	2	0
Carl A. A. Pedersen	Woodcliff Lake, N. J.	10	141	0	0
Mrs. Marie Dumont	Pequannock, N. J.	11½	1218	1	0
Patrick K. Garland	Demarest, N. J.	6 years and 3 half yrs.	953	4	2
Selah Lester	East Hampton, N. Y.	3	6	0	0
LeRoy Wilcox	Speonk, N. Y.	16	447	7	0
Geoffrey Gill	Huntington, N. Y.	17½	300	15	0
Jesse V. Miller	Manhasset, N. Y.	4	343	1	1
Will O. Astle	Flushing, N. Y.	5½	201	0	0
Richard B. Fischer	Flushing, N. Y.	4	509	3	0
R. & G. Ralston	Flushing, N. Y.	6	333	2	1
Howard Mahnken	Brooklyn, N. Y.	3	65	0	0
Dr. Harold B. Wood	Harrisburg, Pa.	15	48	0	0
Ralph E. Wetzel	Boiling Springs, Pa.	2	3	1	0
Raymond J. Middleton	Norristown, Pa.	22½	4435	4	9
William Pepper, Jr.	Wyncote, Pa.	11½	803	14	2
Mrs. C. R. vanHeeswyk	Germantown, Phila., Pa.	3½	23	0	0
Dr. William Pepper	Melrose Park, Pa.	18	1053	9	1
Horace Groskin	Ardmore, Pa.	6	793	18	1
Mr. and Mrs. J. A. Gilles- pie	Glenolden, Pa.	23	1095	58	2
A. L. Baily, III	West Chester, Pa.	1½	80	0	0
A. L. Baily, III	Westtown, Pa.	1	117	0	0
Driver, Hawksley and Remington	Elsah, Ill.	5½	234	4	0
Coburn, Llewellyn, Rob- bins and Stewart	Bowie, Md.	5	574	9	0
W. M. Davidson	Takoma Park, Md.	12	466	11	1
A. E. Clattenburg, Jr.	Chevy Chase, Md.	1	47	1	0
A. E. Clattenburg, Jr.	Washington, D. C.	1	13	0	0
Harry S. Bristow, Jr.	Cedars, Del.	2½	45	4	0
Leon J. Cool, Jr.	Church Falls, Va.	1½	52	0	0
Mrs. Amelia R. Laskey	Nashville, Tenn.	10½	533	17	0

TABLE 1—*Continued*

<i>Bander</i>	<i>Location (north to south)</i>	<i>Years of banding</i>	<i>Total banded</i>	<i>Returns</i>	<i>Recoveries</i>
Ben B. Coffey, Jr.	Memphis, Tenn.	4	1074	0	1
Mrs. Rowland Thomas	N. Little Rock, Ark.	6½	295	50	0
Prof. R. E. Ware	Clemson, S. C.	8	2096	26	0
R. J. Fleetwood	Round Oak, Ga.	5	52	0	0
Dr. William Pepper	Pawley's Isl., S. C.	12	260	16	2
<i>Total</i>			43000	286	41

By far the greatest number of White-throated Sparrows are trapped and banded during the fall migration. At this time their numbers, swollen by birds of the year, are at a peak; the southward movement is more leisurely than the northward journey, and there appear to be more banders active along its migration routes than in the southern wintering areas or the northern breeding grounds. Few coöperators band nesting individuals.

LONGEVITY: RETURNS AND RECOVERIES<sup>1</sup>

When a banded bird is taken as a return or recovery, a slight penetration is made in the mystery surrounding its life expectancy, its tendency to return to familiar places, its migration and its distribution. The large number of return and recovery records at hand—388—furnishes a fairly reliable index to the White-throated Sparrow's life span.

TABLE 2

## LIFE EXPECTANCY OF THE WHITE-THROATED SPARROW

<i>Age</i>	<i>Returns</i>	<i>Recoveries</i>	<i>Total</i>	<i>Per cent of entire quantity</i>
Less than 1 year	0	63	63	16.3
At least 1 year	155	20	175	45.1
At least 2 years	77	12	89	22.9
At least 3 years	30	3	33	8.5
At least 4 years	14	1	15	3.9
At least 5 years	7	2	9	2.5
At least 6 years	1	0	1	.2
At least 6½ years	0	1	1	.2
At least 7 years	1	0	1	.2
At least 8 years	1	0	1	.2
<i>Total</i>	286	102	388	100.0

As shown in table 2, although there were 63 records of birds recovered within a year of the date of banding, there were no such return records. There are two reasons for this. First, it was possible to calculate back to the probable, or at least possible, date that the bird was hatched. Thus a wintering bird banded in April and re-

<sup>1</sup> Return—A bird that has returned to the place of banding after a migration period.

Recovery—A bird trapped or found dead at least five miles from the place of banding.

trapped in October of the same year was at least one year old when taken as a return, even though only six months had elapsed after it was banded. Second, a bird banded in the fall and retrapped at the same station in the succeeding spring had very likely wintered in the vicinity and would not be considered a return at all. It should be pointed out, however, that a bander operating on the nesting grounds could band a young bird in July or August and retrap that bird the following May or June, thereby securing a valid return on a bird less than a year old.

Especially noteworthy is the fact that 63 of the 102 recoveries reported were birds found dead within a year of being banded. Of these 63 birds, 57 were secured at points distant from the banding station, indicating that they were migrating when banded. Only five of these 57 birds found dead were traveling northward; the remaining 52 were headed south. The data therefore suggest a high mortality among migrant White-throated Sparrows, especially among southbound birds. F. C. Lincoln (1939: 60-61) writes of a disaster, which overtook a large number of migrant birds as they crossed over Lake Huron. Included among the many thousands of bodies washed up on the beaches were numerous White-throated Sparrows.

Among the birds which had survived two or three migrations before recapture as return-1<sup>1</sup> individuals, there also appears a sharp reduction in numbers. Whereas 155 records of return-1 White-throated Sparrows were received, there were but 77 reports of birds at least two years old when retrapped. It is not claimed that only 77 of the original 155 were still alive two years after being banded for these represent only those trapped. Another marked decrease apparently takes place among the return-2 birds, for the records show but 30 return-3 birds and a steady decline with each additional year.

The data on hand were examined to see if the White-throated Sparrows that had returned were regularly retrapped in previous or succeeding breeding or wintering seasons. In the 77 return-2 records, 38 had also been taken as return-1's; the remaining 39 had been retrapped only as return-2 individuals. Then the return-3 through return-5 records were reviewed and the findings tabulated. The single return-6 bird was previously taken as a return-1 and as a return-5. Neither the return-7 nor the return-8 was ever recaptured prior to the single return record which each eventually provided.

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<sup>1</sup> By return-1 it is meant a bird that is approximately a year old when retrapped at the place of banding. A return-2 would thus be about two years old even though it may have been the first time the bander recaptured it. The number in such an expression signifies the bird's approximate age.

TABLE 3

## FREQUENCY OF RECAPTURE OF 30 RETURN-3 WHITE-THROATED SPARROWS

<i>Retrapped as return-1</i>	x x x x x x x x x x x x x x 0 0 0 0 0 0 x x x x x x x x 0 0 0
<i>Retrapped as return-2</i>	x x x x x x x x x x x x x x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 x x x

Key:—x—retrapped; 0—not retrapped.

TABLE 4

## FREQUENCY OF RECAPTURE OF 14 RETURN-4 WHITE-THROATED SPARROWS

<i>Retrapped as return-1</i>	<i>Retrapped as return-2</i>	<i>Retrapped as return-3</i>
x	x	x
0	0	0
0	0	0
0	0	0
0	0	0
0	0	x
0	0	x
0	0	x
0	x	x
0	x	x
0	x	x
0	0	0
x	0	0
x	0	0
x	x	0

TABLE 5

## FREQUENCY OF RECAPTURE OF 7 RETURN-5 WHITE-THROATED SPARROWS

<i>Retrapped as return-1</i>	<i>Retrapped as return-2</i>	<i>Retrapped as return-3</i>	<i>Retrapped as return-4</i>
x	x	x	x
x	x	x	x
0	0	0	0
0	0	0	0
x	0	0	0
x	0	0	0
x	x	0	0

Data submitted show that the overwhelming majority of returns are secured at the White-throated Sparrow's breeding and wintering areas. Table 1 substantiates this thought. Certain banders operating in neither the recognized breeding nor wintering areas of this species report a large number of returns in comparison with other banders at no great distance from them. This is explained by the fact that White-throated Sparrows may winter in sheltered places as far north as New England. An example of such a place is the Gill banding station at Huntington, Long Island, New York, situated on the side of a hill whose opposite side was planted some twenty years ago with several acres of Scotch Pine as a small forestry project. The banding stations of Horace Groskin at Ardmore, Pennsylvania, and particularly the station of Mr. and Mrs. John A. Gillespie at Glenolden, Pennsylvania, are similarly situated and afford excellent

wintering sites for this species with unlimited food supplies at the near-by banding stations.

Returns of migrant birds are very rare, if indeed they occur at all. Mrs. Rowland Thomas of North Little Rock, Arkansas, operating on the wintering grounds, had 50 returns from 260 birds, whereas the late W. I. Lyon banded 20,000 transients on the western shore of Lake Michigan without getting a single return. It is apparent that migrant White-throated Sparrows seldom select the same stop-over points on subsequent journeys. (Two banders, Karl E. Bartel at Blue Island, Illinois, and Robert E. Stewart at the Patuxent Research Refuge, Bowie, Maryland, made special concerted attempts to trap these sparrows during the 1943-1944 migratory and wintering season. They especially wanted returns of their own birds and recaptures of White-throated Sparrows banded by other operators (foreign banded birds). Mr. Bartel captured 600 White-throats at Blue Island, but none of them carried bands. Since the species does not winter in his area, he would more likely retrap foreign-banded birds than his own marked individuals. At Bowie, Mr. Stewart trapped 744 unbanded White-throats in addition to 13 returns. No foreign birds were taken.)

Practically all banders whose work is confined largely to migrants have no returns for this species, but they have obtained most of the recovery records. (Mr. Lyon had at least 14 such recoveries.) Many banders lament this lack of return records. They wonder if they should continue to band this species. The authors believe that recovery records are fully as necessary and valuable as return records, especially for investigating the bird's migration and distribution, and that coöperators should band as many White-throated Sparrows as possible, for only thus can data accumulate which will explain this bird's migration.

Experience with marked birds indicates that most species, especially the adults, tend to return to their former breeding and wintering areas. Care has been taken to say "tend to return," and we must continue to use that expression, for it best describes our present knowledge even within a given species. There is, for example, the record of a White-throated Sparrow that wintered during 1925-1926 in New Haven, Connecticut, and then was found "exhausted in a snow-drift" on March 5, 1927, at Kinston, North Carolina (Hubbard, 1927: 48). There may be more shifting of breeding and wintering areas from year to year than this single record would suggest.

## RECOVERIES OF SOUTHBOUND OR WINTERING BIRDS

The extensive data on interstate recoveries of White-throated Sparrows supplied by the Fish and Wildlife Service were carefully reviewed. (Mr. Robbins believed these were practically complete through June, 1940.) From them was extracted each record of a bird banded in one state and recovered in another during the fall migration or before any northward movement took place. August 1 of any year and March 15 of the following year were taken as inclusive dates. August was selected because it is a time when no birds are arriving on the breeding grounds and, in addition, it is a month during which little or no southward movement takes place. March 15 was chosen as the spring deadline because northward migration probably commences in the latter part of that month, at least in the northern portion of the wintering area.

There were 56 records of southbound or wintering individuals as against only five northbound or breeding birds. These 56 records are tabulated in Table 6.

TABLE 6  
POINTS OF BANDING AND RECOVERY OF 56 SOUTHBOUND WHITE-THROATS

Stated banded	State recovered									
	N. Y. (L. I.)	N. J.	Md.	Va.	N. C.	S. C.	Ga.	Ala.	Ark. <sup>1</sup>	Tex. <sup>2</sup>
Ontario								1		
Maine					2	1	1			
New Hampshire				2	1					
Massachusetts	1	2	1	1	3	6	2			1
Connecticut					1					
New York			1	1	4	4	2		2	
Pennsylvania				1	2	4		2		
New Jersey			1		4		1			
Washington, D. C.						1				
<i>Totals—56</i>	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>17</u>	<u>16</u>	<u>6</u>	<u>3</u>	<u>2</u>	<u>1</u>

<sup>1</sup> Arkansas is in the Mississippi Flyway (see p. xxx).

<sup>2</sup> Texas is in the Central Flyway (see p. xxxxx).

The data on interstate recoveries of White-throated Sparrows banded in the Atlantic Flyway were reexamined for all records of birds believed to be wintering at their places of recovery. December 1 through March 15 was considered to be the wintering season. The beginning of December was selected because there probably is some southward movement up to that time. (Termination of the fall migration will be discussed later.) The reason for choosing March 15 has been stated.

In this instance the date of banding is not a consideration as it was with the records appearing in Table 6. Therefore, one or more

migrations had taken place between the dates of banding and recovery. In addition, no attention is given to the states where these birds were banded. The 22 records in this group were added to the 56 in Table 6, and the total of 78 recoveries are summarized in Table 7. For purposes of comparison, but especially to show that the distribution among the various states was substantially unchanged, the data of Table 6 are presented as a part of Table 7.

TABLE 7  
POINTS OF RECOVERY OF 78 WHITE-THROATED SPARROWS

<i>State recovered</i>	<i>Combined total of Tables 6 and 7</i>	<i>Data of Table 6 alone</i>
New York (L. I.)	1	1
New Jersey	4	2
Maryland	3	3
Kentucky	1	0
Virginia	6	5
North Carolina	26	17
South Carolina	24	16
Georgia	7	6
Alabama	3	3
Arkansas	2	2
Texas	1	1
<i>Totals</i>	<hr/> 78	<hr/> 56

Fifty of the 78 recoveries are from North and South Carolina, indicating that the bulk of the eastern White-throated Sparrows winter in those two states. Progressively smaller numbers of wintering birds are encountered as one travels north or south. That the Carolinas harbor many of the wintering White-throated Sparrows has been suggested by Beals and Nichols (1941: 104).

The status of Alabama as a wintering area for Atlantic Flyway White-throats is worthy of mention. Only the southern portion of the state is considered to be within the Mississippi Flyway; the state's eastern boundary barely reaches the western limits of the Atlantic Flyway (Lincoln, 1939: 153, 167). It might be expected, therefore, that a few birds would come down the coastal route and eventually reach Alabama, while a greater proportion would migrate along the interior pathway and also reach that state. Three records of birds that flew down the Atlantic Flyway and 15 that arrived via the Mississippi Flyway indicate the validity of this supposition.

#### THE SPEED OF SOUTHWARD MIGRATION

The southward migration of the White-throated Sparrow is usually regarded as leisurely, with stop-over periods ranging from a day to a week or more. The data have provided a few clues to speeds



attained. It is probable that each White-throat makes a long overnight flight and then rests and feeds for a day or more before resuming its journey. If there were thirty or forty records of birds banded at one station and retrapped the following day at another, a reasonably accurate picture of the White-throated Sparrow's speed of migration could be presented with the distance covered in each flight. Unfortunately, out of 227,334 individuals banded through June, 1943, there is only one such record. That was the bird banded by the late W. I. Lyon at Waukegan, Illinois, at 6:30 p. m. on October 5, 1937, and retrapped at 7:30 the following morning by Karl E. Bartel at Blue Island, Illinois. The distance covered was 60 miles directly south. At the present rate, it will be many years before sufficient records like this one are accumulated.

In lieu of the kind of data needed, records were selected that gave, however scantily, some indication of the average number of miles covered per day. To make the picture as accurate as possible, all averages below ten miles a day were discarded. Possibly all records under 20 miles should have been omitted, for in view of the record above it does not seem likely that a White-throated Sparrow would travel less than 20 miles in a night's flight. These averages conceal at least as much as they reveal. If it is assumed that each bird rested one day after each flight on its journey—and there are indications that this actually happens—then all the averages in Table 8 would be doubled. It is probable that these birds rest more than a single day, and the delay in capture at a banding station is the main source of error.

TABLE 8  
AVERAGE SOUTHWARD SPEED OF WHITE-THROATED SPARROWS

<i>Place banded</i>	<i>Date banded</i>	<i>Date recovered</i>	<i>Place recovered</i>	<i>Distance covered</i>	<i>Miles per day</i>
Andover, Mass.	10/7/35	12/9/35	Pink Hill, N. C.	640	10
Demarest, N. J.	10/6/41	11/13/41	Bowie, Md.	230	11
Fargo, N. D.	9/21/38	11/26/38	Miller, Ark.	811	12
Shirley, Mass.	10/16/38	12/27/38	Tennille, Ga.	920	12
Mohonk Lake, N. Y.	10/4/31	11/11/31	Mocksville, N. C.	540	14
Sherrill, N. Y.	10/8/32	12/29/32	McGehee, Ark.	1080	13
Elmhurst, L. I., N. Y.	9/29/38	11/4/38	Graniteville, S. C.	660	18
Groton, Mass.	10/11/28	11/29/28	Cordele, Ga.	1020	20
Athol, Mass.	10/18/32	11/22/32	Gastonia, N. C. (T)	710	20
Swampscott, Mass.	10/16/32	11/19/32	Nichols, S. C.	750	22
Platteville, Wis.	10/15/40	11/7/40	Blacksburg, Va.	660	28
Fairmont, N. D.	9/30/37	10/6/37	Minneapolis, Minn.	173	29
Swampscott, Mass.	10/20/32	10/29/32	Bridgeton, N. J. (T)	310	34
Waukegan, Ill.	10/5/37	10/6/37	Blue Island, Ill.	60	60

(T)—Trapped at banding station.

## TERMINATION OF THE SOUTHWARD MIGRATION

Since there are records of southbound White-throated Sparrows recovered before they undertook another migration, it is possible to give an approximate date when migrants cease to pass through the northern states, that is, from southern New Jersey northward. Records of White-throated Sparrows banded in November and subsequently recovered farther south include only five, none banded after November 19 and none in December.

TABLE 9

MIGRANT WHITE-THROATS BANDED IN NOVEMBER AND RECOVERED FARTHER SOUTH

<i>Place banded</i>	<i>Date banded</i>	<i>Date recovered</i>	<i>Place of recovery</i>
Wyncote, Pa.	11/5/32	1/2/33	Essex, N. C.
Manchester, N. H.	11/9/32	12/26/32	Sarah, Va.
Washington, D. C.	11/9/38	2/2/39	Galivants Ferry, S. C.
New Haven, Conn.	11/11/32	12/29/32	Enfield, N. C.
Milton, Mass.	11/19/37	1/31/38	Pittsville, Md.

The data are inadequate to justify any rigid statement, hence we venture only to say that the height of the migration has passed by mid-November, and that there probably is little or no southward movement after that date. Northern banders who trap considerable quantities of White-throated Sparrows note a decline in numbers at about this time, but unbanded birds keep appearing even after Christmas. It is believed that these new birds had arrived some time before and were still wandering about the bander's locality in search of suitable feeding and roosting places. There is always the possibility that the birds may have been frequenting the bander's station for many weeks before being captured.

## RECOVERIES OF NORTHBOUND AND BREEDING BIRDS

Among the data sent in, there were but five records of White-throated Sparrows banded on their wintering grounds and subsequently recovered either as northbound or as breeding birds. This small number of records, compared to the 56 recoveries of southbound and wintering birds, was the result of a number of factors. Spring migration is of shorter duration, since the birds are impelled northward by the urge to mate and reproduce. Stop-over periods are thus shorter, and the possibility of banded birds being retrapped by some other operator are substantially reduced. Most of the banded White-throated Sparrows found dead are about yards and gardens, but in spring they visit these places less often. Their breeding sites are located in areas thinly populated by humans, so dead birds are

seldom found. Whenever banded White-throated Sparrows die in spring, summer or fall, their bodies are usually hidden in vegetation.

Not only are the five records inadequate in themselves, but each covers a time interval too large to warrant any conclusions as to speed of the northward movement, or the beginning or end of migration. In the North, migrants pass through from early April to late May. Perhaps a way to tell if an unbanded bird is a migrant is by noting its plumage. Birds wintering at a bander's station, and repeating in his traps, begin to exhibit gradual changes toward breeding plumage, especially about the head, in early April. At the same time, unbanded birds in full breeding plumage appear in the traps. These birds may be migrants newly arrived from the south.

#### OTHER ASPECTS OF MIGRATION

In addition to reporting yearly fluctuations in the numbers of White-throated Sparrows trapped, few banders capture equal numbers of spring and fall migrants. The majority catch more fall than spring migrants. Stack and Harned (1944: 3) suggest that White-throated Sparrows are more inclined to accept artificial baits in spring, for their supply of natural food is then very small. Yet some banders, who consistently operate their traps, regularly capture many more birds in the fall. It would seem, therefore, that part of the explanation for different seasonal captures is also to be found in the location of the banding station. The authors of this paper operate 30 miles apart on the north shore of Long Island, New York, and both take most of their White-throats during the fall migration. However, Fischer is west of Gill's station and therefore nearer the Hudson River flight lane; he sees and captures many more birds. Both stations have approximately equal numbers of traps and both are operated about the same length of time each day.

Field students on Long Island are well aware of the fact that most, if not all, of the passerine migrants become more abundant as one approaches the Hudson River migration lane, one of the branches in the greater Atlantic Flyway. It is probable that wherever large numbers of migrant White-throated Sparrows are taken, the station is situated on or near a major flyway or one of its tributaries. When considerable numbers of migrating birds are seen and but few are captured, such factors as nearness of fresh water, abundant supply of natural food, etc., are operating against the bander.

The fact remains, however, that some of the active, efficient stations regularly band a greater number of spring migrants. These stations are all inland, and are 100 miles or more from the major

arteries of the Atlantic Flyway. It is surmised that these stations lie along migration pathways used largely by northbound White-throats. Why this species should use some routes to a greater extent in spring than in fall, or vice versa, is difficult to explain; nevertheless, such is apparently the case. This and other complex aspects of the White-throated Sparrow were noted by Stack and Harned (1944: 3) in their study.

One of the most intriguing aspects of the White-throated Sparrow's migration encountered in this study involved the crossing of certain birds from one major flyway to another. Ten records at hand include birds from the Atlantic Flyway and from the Mississippi Flyway. C. H. Sanderson at Sherrill, New York, banded one bird on October 8, 1932, which was found dead at McGehee, Arkansas, December 29, 1932. Another trapped October 13, 1931, was found dead at Rector, Arkansas, May 3, 1932. The two points of recovery are 190 miles apart; both are within 40 miles of the Mississippi River. Presumably these two birds started southward in the Atlantic Flyway and subsequently crossed over into the Mississippi Flyway.

Raymond J. Middleton banded a bird at Norristown, Pennsylvania, on October 4, 1930, which was retrapped by Mrs. Fred L. Hook of South Milwaukee, Wisconsin, April 26, 1937. On one of the many migrations that took place in the six years embraced by this record, the bird left the Atlantic and entered the Mississippi Flyway.

The most remarkable of these records is one wherein a White-throated Sparrow banded at Groton, Massachusetts, by Edwin A. Mason in October, 1939, was found dead at "Mt. Horne," Texas, January 28, 1940 (Mason, 1941: 5). The latest Rand and McNally Atlas and Marketing Guide, the most complete map of its kind, does not show a town named Mt. Horne, but it does have a place called Mountain Home. Perhaps the person who reported the dead White-throat wrote a hasty letter and abbreviated Mountain. When written quickly, 'Home' could easily be mistaken for 'Horne.' It is our belief that an error is involved here and that the point of recovery is actually Mountain Home, a town 68 miles northwest of San Antonio. Nevertheless, this bird not only departed from the Atlantic Flyway, but crossed entirely over the Mississippi Flyway and entered the Central Flyway, where it was doubtless wintering when recovered.

The remaining six records represent White-throats that crossed from the Mississippi to the Atlantic Flyway. One, banded at Wilmette, Illinois, on October 4, 1929, by Ted G. Delang was found dead December 27, 1932, at Andrews, South Carolina. A second, cap-

tured May 16, 1930, by Henry E. Wagner at Detroit, Michigan, was recovered at Tabor, North Carolina, on March 12, 1932. Both these birds were recovered in the heart of the eastern wintering area of White-throated Sparrows.

A bird banded October 15, 1940, by Carmen Beining at Platteville, Wisconsin, was trapped by C. O. Handley at Blacksburg, Virginia, on November 7, 1940. The flight covered 660 miles, and the bird averaged 28 miles a day. Another White-throated Sparrow caught at Platteville by Carmen Beining, May 7, 1932, was recaptured January 6, 1933, at Wyncote, Pennsylvania, by William Pepper, Jr. This record is noteworthy in that the bird probably migrated northward in the Mississippi Flyway and, after nesting, entered the Atlantic Flyway and presumably wintered therein.

Lastly, two individuals which Clarence Bretsch marked at Gary, Indiana, have been secured in the Atlantic Flyway. One captured October 20, 1932, was retrapped at Silver Spring, Maryland, April 30, 1934. The other caught April 30, 1938, was recovered at Harlem, Georgia, on February 10, 1942.

The true nature and extent of this fascinating trait of the White-throated Sparrow remains a challenge to every bander. Several students have written regarding the "winter group habit" of these birds and William P. Wharton (1935:128) suggests a mating attachment that may persist after the breeding season and influence the choice of wintering areas. Such theories may point to a solution of much that remains unknown. It is the writers' hope that this paper will encourage every bander to band this species in even greater numbers, and, whenever opportunities arise, to band entire families on their breeding grounds.

In the following Table 10 there are given all records known to the writers of a White-throated Sparrow banded in one state and recovered in a different state.

TABLE 10  
INTERSTATE WHITE-THROATED SPARROW RECOVERIES  
*Atlantic Flyway*

<i>Bander</i>	<i>Place banded</i>	<i>Date</i>	<i>Place recovered</i>	<i>Date</i>
J. P. Wetherill, Jr.	Winter Harbor, Me.	9/6/35	Louis, S. C.	2/—/36
Effie A. Anthony	Bar Harbor, Me.	4/25/33	Millburn, N. J.	c 5/2/34 <sup>1</sup>
Alice C. Wolfe	So. Waterford, Me.	8/18/26	Pitt Co., N. C.	c 3/5/27
W. Rodman Peabody	Northeast Harbor, Me.	8/25/36	Black Creek, N. C.	12/13/36
B. W. McPheters	Bar Harbor, Me.	8/15/32	Reynolds, Ga.	12/15/32
Fr. E. Goellner	Manchester, N. H.	10/21/32	South Boston, Va.	3/20/34
Fr. E. Goellner	Manchester, N. H.	10/10/37	Seminary, Miss.	4/30/38
Fr. E. Goellner	Manchester, N. H.	11/9/32	Sarah, Va.	12/26/32
R. P. Marsden	Hanover, N. H.	4/30/29	Tabor, N. C.	12/24/29

<sup>1</sup> c.—Date approximate.

TABLE 10—Continued

<i>Bander</i>	<i>Place banded</i>	<i>Date</i>	<i>Place recovered</i>	<i>Date</i>
R. P. Marsden	Hanover, N. H.	4/30/29	Florence, S. C.	1/30/30
Richard L. Weaver	Hanover, N. H.	10/13/39	Woodsdale, N. C.	2/8/40
H. C. Fortner	Burlington, Vt.	5/3/29	Newton Grove, N. C.	11/12/29
Leslie Crane	Rutland, Vt.	5/2/32	Sayabec, Quebec	c 8/13/32
Arthur Morley	Swampscott, Mass.	10/16/32	Nichols, S. C.	11/19/32
Arthur Morley	Swampscott, Mass.	10/20/32	Bridgeton, N. J.	T10/29/32 <sup>1</sup>
Arthur Morley	Swampscott, Mass.	10/16/31	Atlantic City, N. J.	12/9/31
Arthur Morley	Swampscott, Mass.	10/18/31	Cambridge, Md.	2/28/34
Robert Allison	Athol, Mass.	10/5/35	Nichols, S. C.	1/31/36
Robert Allison	Athol, Mass.	10/20/32	Raeform, N. C.	c 3/28/33
Robert Allison	Athol, Mass.	10/18/32	Gastonia, N. C.	T11/22/32
E. M. Davis	Shirley, Mass.	10/21/38	Capron, Va.	c 1/29/40
E. M. Davis	Shirley, Mass.	10/22/38	Wilmington, N. C.	1/2/39
E. M. Davis	Shirley, Mass.	10/16/38	Tennille, Ga.	12/27/38
E. M. Davis	Shirley, Mass.	10/6/39	Dandy, Va.	1/6/40
William P. Wharton	Groton, Mass.	10/8/33	Little Bartibogue, N.B.	9/16/35
William P. Wharton	Groton, Mass.	10/11/28	Cordele, Ga.	11/29/28
William P. Wharton	Groton, Mass.	9/26/42	Bowie, Md.	5/7/43
O. L. Austin	N. Eastham, Mass.	10/2/30	Ravenels, S. C.	2/—/31
O. L. Austin	N. Eastham, Mass.	10/15/36	Elmhurst, L. I., N. Y.	12/16/36
W. Rodman Peabody	Milton, Mass.	10/13/30	N. Charleston, S. C.	1/27/31
W. Rodman Peabody	Milton, Mass.	11/19/37	Pittsville, Md.	1/31/38
R. M. Hinchman	Milton, Mass.	10/7/32	Summerville, S. C.	3/13/33
S. M. Pell	Lenox, Mass.	10/9/33	Pine Tops, N. C.	12/30/38
M. L. Shields	Andover, Mass.	10/7/35	Pink Hill, N. C.	12/9/35
Hildegard Thorp	Amherst, Mass.	10/11/31	Lowell, N. C.	c 4/26/32
Mrs. F. D. Hubbard	New Haven, Conn.	11/11/32	Enfield, N. C.	12/29/32
Mrs. F. D. Hubbard	New Haven, Conn.	12/9/25	Kinston, N. C.	3/5/27
Miss C. M. Teot	New Haven, Conn.	4/24/29	Florence, S. C.	1/30/30
Harold L. Hutchins	Hamden, Conn.	5/12/40	Pawley's Is., S. C.	1/16/41
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	11/1/30	Silver Spring, Md.	11/11/32
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/15/37	Prosperity, S. C.	1/15/38
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/14/35	Florence, S. C.	2/3/36
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/14/36	Olanta, S. C.	2/3/38
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	11/26/36	W. Englewood, N. J.	3/5/38
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/22/32	Mullens, S. C.	2/20/36
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/12/38	Whiteville, N. C.	1/16/39
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	10/7/38	Berlin, Md.	2/6/39
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	11/11/36	Maplewood, N. J.	c11/12/39
Mrs. M. V. Beals	Elmhurst, L. I., N. Y.	9/29/38	Graniteville, S. C.	11/4/38
Arthi A. Allen (?)	Ithaca, N. Y.	4/29/20	Cumming, Ga.	1/15/21
Verdi Burtch	Branchport, N. Y.	4/30/40	Trimmonsville, S. C.	12/25/40
R. & G. Ralston	L. I. City, L. I., N. Y.	2/6/36	Belle Cote, N. Scotia	Fall '37
A. K. Smiley, Jr.	Mohonk Lake, N. Y.	10/3/30	Rockingham, N. C.	4/7/31
A. K. Smiley, Jr.	Mohonk Lake, N. Y.	10/4/31	Mocksville, N. C.	11/11/31
A. K. Smiley, Jr.	Mohonk Lake, N. Y.	9/26/32	Fair Bluff, N. C.	12/3/32
C. K. Sanderson	Sherrill, N. Y.	10/8/32	McGehee, Ark.	12/29/32
C. H. Sanderson	Sherrill, N. Y.	10/13/31	Rector, Ark.	5/3/32
Florence K. Daley	Oliverea, N. Y.	10/19/39	Lithonia, Ga.	c 3/8/40
Verdi Burtch	Branchport, N. Y.	10/6/39	Dyer, Tenn.	12/6/40
H. A. Southerland	Hall, N. Y.	5/5/24	Boxley, Ga.	1/15/30
William Vogt	Wantagh, N. Y.	10/9/32	Haw River, N. C.	4/2/34
Edward M. Davis	Shirley, Mass.	10/18/37	Flushing, N. Y.	11/17/37
Forrest A. Dilling	Bowmanville, Ont.	10/5/41	Montgomery Co., Ala.	4/10/44
Ralph E. DeLury	Ottawa, Ont.	10/14/30	Morris, Ala.	1/5/31

<sup>1</sup> T.—Trapped by a bander.

TABLE 10—Continued

<i>Bander</i>	<i>Place banded</i>	<i>Date</i>	<i>Place recovered</i>	<i>Date</i>
B. S. Bowdish	Demarest, N. J.	10/28/39	Augusta, Ga.	2/—/40
B. S. Bowdish	Demarest, N. J.	10/3/35	Monck's Corner, S. C.	1/1/38
B. S. Bowdish	Demarest, N. J.	10/11/38	Williamston, N. C.	2/—/39
B. S. Bowdish	Demarest, N. J.	10/5/33	Claredon, N. C.	3/2/34
B. S. Bowdish	Demarest, N. J.	4/27/30	Maxton, N. C.	2/1/32
Dumont Banding Sta.	Pequannock, N. J.	9/23/38	Fayetteville, N. C.	12/27/38
Dumont Banding Sta.	Pequannock, N. J.	10/16/37	Lenoir, N. C.	10/13/38
Keohon Garland	Demarest, N. J.	10/26/41	Bowie, Md.	11/14/41
B. K. Matlack	Bridgeton, N. J.	11/4/25	Barnwell, S. C.	3/23/26
B. K. Matlack	Bridgeton, N. J.	10/29/33	Littleton, N. C.	2/9/36
Mrs. A. N. Pack	Princeton, N. J.	9/30/32	Walstonburg, N. C.	12/22/32
Mrs. Chas. L. Bull	Oradell, N. J.	4/28/31	Herbert Office, Kent Co., N. B.	6/—/32
R. J. Middleton	Norristown, Pa.	10/18/34	Bethel, N. C.	2/1/36
R. J. Middleton	Norristown, Pa.	10/9/35	Camden, S. C.	3/15/36
R. J. Middleton	Norristown, Pa.	10/15/23	Paoli, Pa.	10/26/23
R. J. Middleton	Norristown, Pa.	10/8/31	Hope Mills, N. C.	1/15/33
R. J. Middleton	Norristown, Pa.	10/17/34	Galivants Ferry, S. C.	12/10/34
R. J. Middleton	Norristown, Pa.	10/3/38	Ridgeland, S. C.	3/10/39
R. J. Middleton	Norristown, Pa.	10/12/38	Waderboro, N. C.	2/1/40
R. J. Middleton	Norristown, Pa.	5/5/41	Hemingway, S. C.	1/10/42
R. J. Middleton	Norristown, Pa.	10/8/28	Manchester, N. H.	4/29/30
R. J. Middleton	Norristown, Pa.	10/4/30	S. Milwaukee, Wis.	4/26/37
R. J. Middleton	Norristown, Pa.	5/2/35	St. Pauls Is., N. S.	5/8/38
Dr. William Pepper	Melrose Park, Pa.	12/2/38	Severn, Va.	2/2/39
Dr. William Pepper	Pawleys Isl., S. C.	4/20/37	Auburn, N. Y.	10/1/41
William Pepper, Jr.	Wyncote, Pa.	11/5/32	Essex, N. C.	1/2/33
William Pepper, Jr.	Wyncote, Pa.	10/29/36	Windham Center, Vt.	11/15/39
Henry P. Bailly	Overbrook, Pa.	10/12/33	White Stone, Va.	3/1/34
Henry P. Bailly	Overbrook, Pa.	10/15/39	Russellville, Ala.	3/8/40
J. A. Gillespie	Glenolden, Pa.	10/30/32	Vauchuse, S. C.	11/9/34
J. A. Gillespie	Glenolden, Pa.	10/27/38	Chester, S. C.	1/5/39
Horace Groskin	Ardmore, Pa.	10/29/38	Aberdeen, N. C.	12/10/38
H. D. McCann	Paoli, Pa.	10/30/32	Wetumpka, Ala.	3/13/33
William Davidson	Takoma Park, Md.	5/5/39	Colon, N. C.	3/10/41
Alfred O. Ramsay	McDonough, Md.	11/3/33	Efingham, S. C.	11/15/34
Fr. Edward Stoehr	Washington, D. C.	11/9/38	Galivants Ferry, S. C.	2/2/39
I. H. Johnston	Charleston, W. Va.	12/6/24	Bamen, Ky.	3/15/26
William P. Wharton	Summerville, S. C.	2/22/33	Four Oaks, N. C.	12/22/33
William P. Wharton	Summerville, S. C.	3/13/33	Concord, N. C.	11/6/33
William P. Wharton	Summerville, S. C.	3/22/34	Tuberville, S. C.	1/31/36
William P. Wharton	Summerville, S. C.	1/19/34	St. John, N. Scotia	8/10/34
William P. Wharton	Summerville, S. C.	2/20/36	Millertown, N'f'd'd.	8/6/36
William W. Neely	Chester, S. C.	2/18/40	L'anse au Griffin Twp., Gaspé Co., Quebec	6/15/40
Mrs. Mabel T. Rogers	Milledgeville, Ga.	2/8/52	West Chester, Pa.	4/18/42
Mrs. Mabel T. Rogers	Milledgeville, Ga.	3/5/39	Meadows of Dan, Va.	5/9/39
Clarence Bretsch	Gary, Ind.	10/20/32	Silver Spring, Md.	4/30/34
Clarence Bretsch	Gary, Ind.	4/30/28	Harlem, Ga.	2/10/32
Henry E. Wagner	Detroit, Mich.	5/16/30	Tabor, N. C.	3/12/32
Carmen Beining	Platteville, Wis.	10/15/40	Blacksburg, Va.	11/7/40
Carmen Beining	Platteville, Wis.	5/7/32	Wyncote, Pa.	1/6/33
Ted G. Delang	Wilmette, Ill.	10/4/29	Andrews, S. C.	12/27/32

#### SUMMARY

This study is based on data submitted by 52 banders and on information provided by F. C. Lincoln and Chandler S. Robbins of the U. S. Fish and Wildlife Service.

A total of 227,334 White-throated Sparrows were banded before July 1, 1943; contributors to this study accounted for 43,000 of these, the great majority of which were banded as migrants. Records of 102 recoveries and 286 returns were submitted.

Returns are secured almost exclusively by those who band breeding or wintering birds. It is doubtful if White-throated Sparrows banded while migrating are ever taken as returns. Most of the recovery records came from banders whose work deals largely with migrants because those are the chief ones banded.

There is apparently a high mortality among migrating White-throated Sparrows, especially among birds making the southbound trip.

The wintering grounds of eastern White-throated Sparrows are centered in North and South Carolina.

It was not possible to establish an accurate average speed of southward migration. The record of a bird that made an overnight flight of 60 miles barely suggests what the species is able to accomplish.

Seasonal and yearly variations in the number of White-throated Sparrows trapped at many stations, and ten instances wherein birds crossed from one of the major flyways to another, indicate that the species has a complex migration which requires a wealth of data for its explanation.

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## ORNITHOLOGICAL RESULTS OF THE BAFFIN ISLAND EXPEDITIONS OF 1928-1929 AND 1930-1931, TOGETHER WITH MORE RECENT RECORDS

BY J. DEWEY SOPER

(Continued from page 239)

55. *Nyctea nyctea* (Linnaeus), SNOWY OWL. Eskimo: *Añk'pik*.—On the 1928-1929 expedition the Snowy Owl was so scarce that not a single one was noted until July 12, 1929, when a solitary bird was recorded as the party ascended Blue Goose River northeast of Camp Kungovik. It was not observed again that season. During 1930-1931, at Lake Harbour, the species was comparatively rare. In the former season the writer saw only three individuals during August, none in September, and only one during October. It was not again noted up to the time of leaving the country in early August, 1931. The writer has records of the Snowy Owl nesting at Amadjuak Bay and Cape Dorset (1926), so it may be assumed that scattered pairs breed throughout southern districts. Judging from personal observations made at Pond Inlet in the late summer of 1923, the species is much commoner in far northern sections of the island.

56. *Otocoris alpestris* (Linnaeus), HORNED LARK. Eskimo: *Köpënwá'pá*.—There is still some uncertainty regarding the true identity of the southern Baffin Island horned larks. The races are not easy to define, and this is especially true where ranges meet or overlap, as they obviously do on Baffin Island and apparently, as well, on Southampton Island. It now appears fairly certain, however, that southern Baffin Island birds are referable to both *hoyti* and *alpestris* (see Soper, 1928: 108-109, and Sutton, 1932: 211).

On the whole, the population in this territory appears to be a mixed one, but with *alpestris* characters predominant. With much more collecting carried out from eastern and western extremes, it appears probable that birds from the southeastern part of the island will prove to be the strongest in those characters which typify