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THE LENGTH OF STAY OF MIGRATORY BIRDS IN SOUTHEASTERN PENNSYLVANIA

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ONE of the problems of bird study that has long fascinated me is how long do the individuals of migratory species stop to rest and feed as they journey north in spring to the breeding grounds or south in autumn to their winter residence.

During migrations, flocks of birds may settle down in the fields and woodlands, be there for a time and then overnight disappear, this does not prove that they have flown on as they may remain for days in the general vicinity, feeding here or there as they rest in preparation for a continuance of their journey. Previous to the day of bird banding it was impossible to determine if any individuals do actually remain for some length of time.

Little information has been published on this, a subject that banders can solve. It should be kept in mind that when individuals of migratory species repeat in the traps a few days after being banded, this is not proof that this period constitutes their entire length of stay, but it does give conclusive evidence of their presence in the general area of the banding station during the intervening time.

Our station was established in July, 1921; from then to January 1, 1939 we have banded 18,200 birds of 112 species. Sixty-four species are resident in summer or winter, of this group 11,870 were banded; the remaining 48 species are entirely migratory in this region, of these 6,330 were banded. Individuals of 23 of the migratory species have repeated in the traps shortly after being banded.

The number of days that elapsed after the day they were first captured and banded until the birds re-entered the traps constitutes the basis on which the following data are obtained:

WARBLERS

	<i>Species banded</i>	<i>Migratory</i>	<i>Summer resident</i>
	31	24	7
Number banded.....	1592	1070	522

Individuals of ten migratory species have repeated from this group. Nearly 90 per cent of those taken have been captured during the fall migration, consequently the repeats given are almost entirely of that season.

Olive-backed Thrush (*Hylocichla ustulata swainsoni*)—221 Banded, 13 Repeated

2 remained 2 days (spring)	2 remained 2 days (fall)
1 remained 3 days (spring)	2 remained 3 days (fall)
2 remained 4 days (spring)	1 remained 4 days (fall)
1 remained 5 days (spring)	1 remained 5 days (fall)
	1 remained 9 days (fall)

Gray-cheeked Thrush (*Hylocichla minima aliciae*)—73 Banded, 15 Repeated

2 remained 2 days (spring)	1 remained 2 days (fall)
1 remained 3 days (spring)	1 remained 3 days (fall)
4 remained 4 days (spring)	3 remained 4 days (fall)
	1 remained 7 days (fall)
	2 remained 12 days (fall)

This species is one of the latest migrants to appear in spring in this vicinity, yet two that were first captured on May 31st remained four days. When one considers the distance this species has yet to travel to reach their breeding grounds, it seems unusual for them to stop over for this length of time at so late a date.

Bicknell's Thrush (*Hylocichla minima minima*)—7 Banded, 2 Repeated

1 remained 2 days (spring)	1 remained 5 days (spring)
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KINGLETS AND WRENS

Eastern Ruby-crowned Kinglet (*Corthylus calendula calendula*)—214 Banded, 8 Repeated

3 remained 2 days	1 remained 5 days
1 remained 3 days	1 remained 8 days
2 remained 4 days	

Eastern Winter Wren (*Nannus hiemalis hiemalis*)—210 Banded, 23 Repeated

7 remained 2 days (fall)	1 remained 8 days (fall)
4 remained 3 days (fall)	1 remained 9 days (fall)
2 remained 4 days (fall)	1 remained 10 days (fall)
1 remained 5 days (fall)	1 remained 11 days (fall)
4 remained 6 days (fall)	1 remained 13 days (fall)

This species does not winter in the vicinity of the banding station.

SPARROWS

Lincoln's Sparrow (*Melospiza lincolni lincolni*)—12 Banded, 3 Repeated

2 remained 2 days	1 remained 3 days
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Swamp Sparrow (*Melospiza georgiana*)—54 Banded, 5 Repeated

3 remained 4 days (spring)	1 remained 8 days (spring)
1 remained 7 days (spring)	

Eastern Fox Sparrow (*Passerella iliaca iliaca*)—192 Banded, 44 Repeated

7 remained 2 days	2 remained 9 days
4 remained 3 days	7 remained 10 days
4 remained 4 days	3 remained 11 days
2 remained 5 days	2 remained 13 days
5 remained 6 days	2 remained 15 days
6 remained 8 days	

Red-eyed Towhee (*Pipilo erythrophthalmus erythrophthalmus*)—200 Banded, 34 Repeated

This species is a fairly common summer resident, but during October of each year there are small flocks of them migrating in company with many of the Sparrows. During this period the following data have been obtained:

5 remained 2 days	8 remained 4 days
10 remained 3 days	3 remained 5 days

White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*)—46 Banded, 5 Repeated

3 remained 2 days	1 remained 10 days
1 remained 3 days	

White-throated Sparrow (*Zonotrichia albicollis*)—3541 Banded, 1760 Repeated

This species is a common spring migrant, and an abundant fall migrant, 85 per cent of those banded being taken in the latter season. A few individuals at the end of each fall migration remain to winter, the records of these winter residents are not included in the following figures, only those that are entirely migratory being used.

Spring Migration

32 remained 2 days	15 remained 5 days
21 remained 3 days	8 remained 6 days
18 remained 4 days	1 remained 8 days

Fall Migration

300 remained 2 days	15 remained 16 days
240 remained 3 days	10 remained 17 days
210 remained 4 days	8 remained 18 days
156 remained 5 days	10 remained 19 days
150 remained 6 days	9 remained 20 days
140 remained 7 days	6 remained 21 days
130 remained 8 days	8 remained 22 days
60 remained 9 days	7 remained 25 days
54 remained 10 days	3 remained 27 days
51 remained 11 days	5 remained 28 days
20 remained 12 days	1 remained 30 days
18 remained 13 days	2 remained 35 days
20 remained 14 days	1 remained 40 days
12 remained 15 days	

SUMMARY

To arrive at a possible average it seems advisable to add the number of days that all remained and divide by the total of individual birds that were re-taken. Again may I mention that this average as arrived at by the above method only gives evidence that these particular birds did remain that long, many of them may have stayed longer but did not enter the traps again.

Regarding the thrushes, an abundance of berries in the fall season may have influenced them to remain longer than is customary, also quantities of natural food and feed in the many traps may have been responsible for many of the sparrows remaining unusually long.

In the following averages, the warblers are grouped as a whole, as many of the records given contain only a few individuals of some species:

AVERAGE LENGTH OF STAY

Warblers	4.4 days
Eastern Hermit Thrush	5.2 days
Olive-backed Thrush	3.75 days
Gray-checked Thrush	4. days
Bicknell's Thrush	3.5 days
Veery	2.5 days
Eastern Ruby-crowned Kinglet	3.75 days
Eastern Winter Wren	4.5 days
Red-eyed Towhee	4.66 days
Lincoln's Sparrow	2.33 days
Swamp Sparrow	5.4 days
Eastern Fox Sparrow	Spring 7.75 days
Eastern Fox Sparrow	Fall 5.5 days
White-crowned Sparrow	3.8 days
White-throated Sparrow	Spring 3.8 days
White-throated Sparrow	Fall 6.25 days

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NESTING OF THE FIELD SPARROW AND
SURVIVAL OF THE YOUNG

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(Continued from page 114)

THE YOUNG

THE natal down of the Field Sparrow is "mouse-gray." (Dwight, 1900, p. 199.) This down is located as follows:

<i>Region</i>	<i>Length of down in mm.</i>	<i>Number of tufts</i>
Coronal	5	4-6
Occipital	5	5-7
Mid-dorsal	6-7	10-12
Scapular	6	4-5
Humeral	4	2
Femoral	5-6	6
On femur	4	2
Abdominal	5	10-12

The color of the skin and legs is pinkish, the bill pinkish, grayed near the tomia. The lining of the mouth is yellowish, pinker near the side. The small egg tooth, near the tip of the maxilla, is white and soon disappears. The eyes show in large gray areas beneath the skin and are closed. No suggestions of feather tracts are visible.

The weight of the young bird which hatched in my hand was 1.5 grams. His wing measured from the bend to the tip, 6 mm. The tarsus measured 5 mm. and the culmen 3 mm. Some young weighed when first observed as low as 1.1 grams. The average weight of 47 individuals before they were one day old was 1.71 grams.

By the second day the primaries showed in dark lines through the skin. The dorsal feather tracts were discernible. The ventral