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AGE CLASSES OF BIRDS MIGRATING SOUTHWARD  
THROUGH CENTRAL NEW JERSEY - AUTUMN 1970

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By Donald S. Heintzelman

The examination of age classes of birds migrating southward during autumn has become popular among bird banders in eastern North America as commented upon recently by Barry (1971), Leberman and Clench (1969, 1970), Marsi (1972) and Murray (1966). In brief, it is commonly reported that banding stations located well inland from the Atlantic Coast record considerably larger numbers of adult birds in proportion to birds of the year of most species than do coastal stations. This paper analyses data concerned with the 1,117 birds banded and aged by standard skulling and/or other characteristics by a group of volunteers over a period of 105 days between 2 July and 5 December 1970 on the New Land Research Reserve located about 1.5 miles south of Hopewell, Mercer County, New Jersey. This station is inland about 48 air miles northwest of Island Beach State Park, New Jersey, and about ten miles east of the Delaware River [Figure One].

Description of the Reserve and its birdlife, and a summary of the age, sex and wing lengths of the migrants banded there during the autumn of 1970, have appeared elsewhere (Heintzelman, 1971a, 1971b), but these papers made no attempt to calculate the percentages of Hatching Year (HY) and After Hatching Year (AHY) birds, or to compare this information with various other nearby coastal and inland stations. These are the purposes of this paper. Only species for which ten or more individuals were banded are considered in Table One. Table Two summarizes by families the sample of 1,117 birds reported in Table One. With all 30 species [Table One] considered collectively, approximately one-third were AHY birds whereas about two-thirds were HY individuals. Compared on a species to species basis, the proportion of AHY birds ranged from one percent (in five species) to 100 percent.

Discussion

Considered at face value, the figures in the tables may be somewhat misleading unless qualified. In point of fact, several different populations of birds are represented in the data. Included are migrants (birds not breeding in our region but passing through enroute from their breeding grounds to their wintering grounds), permanent residents (both migratory individuals and local, non-migratory birds), winter residents (some individuals remain in our area throughout winter, but others continue to move further south), and summer residents (birds which leave our area after the completion of the nesting season and return again the following spring).



FIGURE ONE. Approximate location of the New Land Research Reserve, about 1.5 miles south of Hopewell, Mercer County, New Jersey.

Comparison of the New Land Research Reserve data with similar information tabulated by Barry (1971:64-65) from reports by Murray (1966) and Leberman and Clench (1969, 1970) for various coastal and inland stations, produced some interesting results when the Reserve birds are grouped into the respective migration classes just mentioned.

### Migrants

Examples of migrants, *i.e.* species which did not breed on the Reserve or in our area but pass through in migration are the Hermit Thrush, Swainson's Thrush, Gray-cheeked Thrush, Magnolia Warbler, Black-throated Blue Warbler and Myrtle Warbler. The migration patterns of these species show some striking differences. Among the thrushes, the Hermit and the Gray-cheeked show very high and remarkably similar percentages of HY birds passing through the Reserve, but the Swainson's Thrush is represented in our data by many more AHY individuals. Thus, for these three species, the Hermit and Gray-cheeked Thrushes exhibit migration percentages similar to coastal patterns whereas the Swainson's Thrush more closely approximates patterns recorded at inland stations. Among the three purely migrant wood warblers, the Magnolia and Black-throated Blue show patterns more allied to inland migration age ratios whereas the Myrtle fairly closely resembles the HY percentages at coastal stations.

### Permanent Residents

Species in this second group include the Mourning Dove, Blue Jay, Tufted Titmouse, Mockingbird, Starling, American Goldfinch, and Song Sparrow. Aside from the Mourning Dove (HY=18.0 percent), Blue Jay (HY=55.7 percent) and American Goldfinch (HY=46.7 percent), these birds show quite high percentages of HY individuals. Doubtless our sample contains local AHY individuals and their offspring plus some migrants from more northern migratory populations. I have no explanation for the lower HY percentages for the Blue Jay and the American Goldfinch, and the very low percentages of HY Mourning Doves is puzzling.

### Winter Residents

Although a number of species included in Table One are present on the Reserve during winter, it could be argued that only the Slate-colored Junco and the White-throated Sparrow are true winter residents. Both show moderately high percentages of HY individuals but we recorded far more AHY birds than occur along the coast at Island Beach State Park (cf. Murray, 1966). Thus our Reserve data suggest a migration pattern for these species more reflective of an inland rather than coastal location.

### Summer Residents

Species which nest locally, then migrate southward during autumn and are absent from the Reserve until the next spring, include the Eastern Phoebe, House Wren, Wood Thrush and Yellowthroat. The 12 Phoebes in our sample were HY which might sug-

gest that they were reared locally. However, all were netted between mid-September and mid-October and nearly all had little or no fat present -- a characteristic often attributed to migrants newly arrived at banding stations. The relatively high percentages of HY House Wrens and Wood Thrushes doubtless contain birds fledged on or in the vicinity of the Reserve, however. In contrast, the rather low percentages of HY Yellowthroats may reflect a migration pattern more similar to an inland sample than a coastal sample.

#### Conclusion

On an overall basis, the migration of individuals of non-local bird populations flying southward through the New Land Research Reserve suggests a pattern more characteristic of the inland areas, where relatively larger numbers of AHY birds occur, than of coastal stations such as Island Beach State Park where a very low preponderance of AHY birds are banded. Considerable variation exists among species and families, however, and this conclusion should be considered only tentative. It is hoped that this comparison will be confirmed or challenged by others conducting additional field studies in our region.

#### Acknowledgements

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New Jersey State Museum, 205 West State Street, Trenton, N.J. 08625.

TABLE ONE. AGE RATIOS OF BIRDS BANDED IN CENTRAL NEW JERSEY - AUTUMN 1970.

Species	N	HY	%HY	AHY	%AHY
Mourning Dove ( <i>Zenaidura macroura</i> )	50	9	18.0	41	82.0
Eastern Phoebe ( <i>Sayornis phoebe</i> )	12	12	100.0	0	00.0
Blue Jay ( <i>Cyanocitta cristata</i> )	61	34	55.7	27	44.3
Tufted Titmouse ( <i>Parus bicolor</i> )	17	14	82.4	3	17.6
House Wren ( <i>Troglodytes aedon</i> )	32	26	81.4	6	18.6
Mockingbird ( <i>Mimus polyglottos</i> )	30	24	80.0	6	20.0
Catbird ( <i>Dumatella carolinensis</i> )	79	51	64.5	28	35.5
Brown Thrasher ( <i>Toxostoma rufum</i> )	15	4	26.7	11	73.3
Robin ( <i>Turdus migratorius</i> )	17	16	94.2	1	5.8
Wood Thrush ( <i>Hylocichla mustelina</i> )	18	13	72.3	5	27.7
Hermit Thrush ( <i>Catharus guttatus</i> )	12	11	91.6	1	8.4
Swainson's Thrush ( <i>Catharus ustulatus</i> )	79	53	67.1	26	32.9
Gray-cheeked Thrush ( <i>Catharus minimus</i> )	26	25	96.1	1	3.9
Starling ( <i>Sturnus vulgaris</i> )	10	9	90.0	1	10.0
Red-eyed Vireo ( <i>Vireo olivaceus</i> )	18	16	88.9	2	11.1
Black & White Warbler ( <i>Mniotilta varia</i> )	14	6	42.8	8	57.2
Magnolia Warbler ( <i>Dendroica magnolia</i> )	32	11	34.1	21	65.9
Black-thr. Blue W. ( <i>D. caerulescens</i> )	11	6	54.6	5	45.4
Myrtle Warbler ( <i>Dendroica coronata</i> )	11	10	90.1	1	9.9
Ovenbird ( <i>Seiurus aurocapillus</i> )	17	11	64.8	6	35.2
Yellowthroat ( <i>Geothlypis trichas</i> )	70	28	40.0	42	60.0
American Redstart ( <i>Setophaga ruticilla</i> )	38	23	60.5	15	39.5
American Goldfinch ( <i>Spinus tristis</i> )	30	14	46.7	16	53.3
Rufous-s. Towhee ( <i>Pipilo erythrophthalmus</i> )	59	47	79.6	12	20.4
Savannah Sparrow ( <i>Passerculus sandwichensis</i> )	46	36	78.4	10	21.6
Slate-colored Junco ( <i>Junco hyemalis</i> )	13	10	76.9	3	23.1
Field Sparrow ( <i>Spizella pusilla</i> )	91	72	79.1	19	20.9
White-thr. Sparrow ( <i>Zonotrichia albicollis</i> )	18	13	72.4	5	27.6
Swamp Sparrow ( <i>Melospiza georgiana</i> )	31	22	71.0	9	29.0
Song Sparrow ( <i>Melospiza melodia</i> )	160	113	70.7	47	29.3

TABLE TWO. AGE RATIOS BY FAMILIES OF BIRDS BANDED IN CENTRAL NEW JERSEY - AUTUMN 1970.

Family	N	HY	%HY	AHY	%AHY
Columbidae	50	9	18.0	41	82.0
Tyrannidae	12	12	100.0	0	00.0
Corvidae	61	34	55.7	27	44.3
Paridae	17	14	82.4	3	17.6
Troglodytidae	32	26	81.4	6	18.6
Mimidae	124	79	63.7	45	36.3
Turdidae	152	118	77.7	34	22.3
Sturnidae	10	9	90.0	1	10.0
Vireonidae	18	16	88.9	2	11.1
Parulidae	193	95	49.2	98	50.8
Fringillidae	448	327	73.1	121	26.9
TOTALS	1117	739	66.1	378	33.9

\* \* \*

## THREE-YEAR BANDING PROJECT OF TREE SWALLOWS

By Kenneth Wade Prescott

The recent article by Frederick S. Schaeffer (1971) on Tree Swallows, *Iridoprocne bicolor*, at coastal and inland areas referred to the present study than in manuscript form. This three-year study (1968-1970) was conducted at the New Land Research Reserve, located about 1.5 miles south of Hopewell, Mercer County, New Jersey. The reserve is owned and operated by the Stonybrook-Millstone Watershed Association. It preceded that portion of Schaeffer's study also at the Reserve.

During the winter of 1966-1967, Richard Thorsell, then Program Director of the Association, installed with the help of Boy Scouts approximately 10 nest boxes on metal poles in and near an artificial pond that had only recently been created by the damming of a small, meandering stream. Shortly after the pond had been formed, Thorsell had observed Tree Swallows flying over the pond and wondered if it would be possible to establish a colony. In the spring and summer of 1967, I observed that Tree Swallows had indeed occupied some of the nest boxes and successfully fledged young. The Association granted permission to the New Jersey State Museum for its personnel (I was then associated with the Museum) to conduct a banding study of the newly established colony. In Schaeffer's figure 2, the location of the 44 nest boxes at the Reserve are given although the number varied from 10 (1967) to 9 (1968), to

## Tree Swallows

23 (1969), 21 (1970) and to 44 (1971).

The author was assisted in the field by his daughter and sub-permittee bander. She recorded all data in our field notebook and provided a summary to Schaeffer some of which were incorporated in his report but additional data used here were not available to him.

## Nesting Success

Table One gives the number of boxes in which nests were built and from which young were known to have been successfully fledged in comparison with the number of boxes available for the three year period of this study.

TABLE ONE.	1968	1969	1970
Available boxes	9	23	21
Used and Successful	5	6	8
Percentage successful	55.5%	26.1%	38.1%

Insofar as successful nest box occupancy is concerned, adults in the population utilized over one-half of the available boxes in 1968, but apparently there were not a sufficient number of adults in the population for the years subsequent to 1968 to take advantage of the increased number of boxes. In 1968, one box contained nesting material and one egg but this was the only nest box of the three year study to contain an abandoned nest. Some "empty" boxes contained a few pieces of nesting material but not enough to indicate that actual nest construction had begun. In 1971, 11 of Schaeffer's 44 nest boxes were occupied. If young were successfully fledged from each of the eleven nests, the comparable percentage would be 25.0%.

Is there a preference for over-water nest boxes? Although these data are insufficient for other than a tentative conclusion, the successful fledging of young from 60% of the available over-water boxes during the three-year study rather strongly suggests that there is a preference by the Tree Swallow for over-water sites to those available in adjacent open field areas. [Table Two]

One pole in the pond contained two nest boxes of which only one was utilized during the three year period. Both boxes were included in the total number of available "over-water" boxes. If the Tree Swallow has a preference for one nest box rather than two per pole, the percentage of preference for single over-water nest boxes would be even more strongly indi-