BIRD-BANDING

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STUDIES OF WARBLER MIGRATION NEAR CANTON, OHIO[1]

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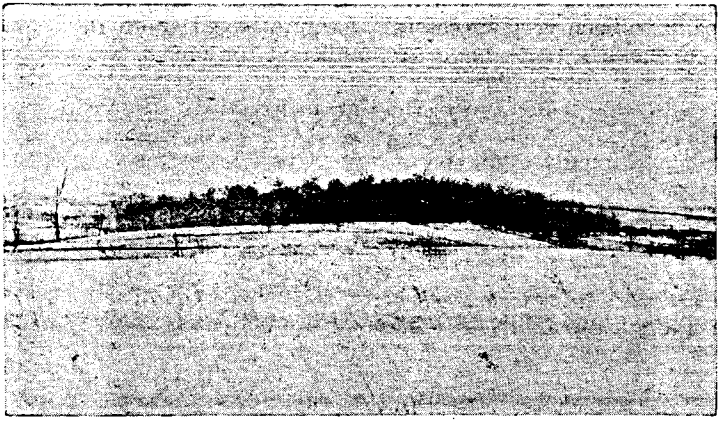
LOCATED on the crest and south slope of a hill which is a conspicuous landmark of the prehistoric glacier's most southern advance in this vicinity is a six-acre wood that I have given the Indian name of *Tsis Kwâhi*, meaning "bird place" (see photograph). This is my banding station. The wood contains a dense growth of underbrush, much of it being nearly impenetrable. Wild grape vines, poison ivy, Virginia creeper, and bittersweet comprise the undergrowth. The principal tree in the woods is the wild cherry, ranging in all sizes up to seventy feet tall. There are also a few dogwood, ash, and elm and a number of large oak trees. The wood is not dense, but the trees are rather evenly distributed throughout.



View of the woods looking southwest after a heavy snow. The lower half of the woods is protected from the wind by the hill on the upper side. Notice the snow still clinging to the branches.

[1]Contribution No. 2, Department of Ornithology, Canton Museum of Natural History.

I have trapped nearly four thousand birds representing one hundred species in this wood in less than three years. Generally speaking, this is a very small number of birds compared to the number banded at the large stations every year, but when I point out that more than eleven hundred of these birds were warblers, including thirty-three of the forty odd species which visit northern Ohio, it will be evident that this is an unusually large number of these birds to be taken at one station in such a short time. The station environment, the type of trap used, and its location have been contributing factors, I believe, in trapping many of these interesting birds.

"The majority of land-birds," says the late Mrs. Mabel Osgood Wright, "prefer the nearness to habitations rather than the isolation of deep woods." I consider this a perfect explanation of the popularity of my station with many species of migratory birds. In corroboration of Mrs. Wright's statement, there is a wood of more than one hundred acres one mile directly south of my station that is denser than *Tsis Kwâhi*, lacks the heavy underbrush, and is situated on lower ground. I have visited this wood frequently during the height of the migrations and have always observed it to be entirely free of all migrants.

At my station I have in operation four of Dr. Brenckle's six-celled water traps and an Inland creeper trap. Outside the woods, along a fence-row in a near-by old orchard, there is located a combination eight-celled water-and-drop trap, and, with three pole traps, these comprise my complete trapping equipment. I have trapped only a few Black and White Warblers in the creeper trap, but the water traps have been very successful. I cannot speak too highly of what Dr. Brenckle's traps have accomplished for me in the few years I have used them. At every station where passerine birds abound I am sure that if just one of these traps were used, the results would be surprising.

In the immediate vicinity of my traps I let as much underbrush grow as possible, as long as it does not interfere with the birds' vision of the water. The more natural the surroundings about a trap, the greater will be the numbers of birds of all species enticed to it. In addition I place in the ground on each side of the top doors of the traps, a twig about seven inches high with a small fork on its upper end. A branch an inch in diameter is laid across these forks. This arrangement is to give the bird that is attracted to the water a convenient perch to alight upon within jumping distance of the trigger stick. Because of its rustic construction it has much to do with calming the instinctive fears the birds have when about the traps. Back three inches from the trap and eighteen inches above the ground, I place three forked twigs in a triangle, and from one fork to the other is laid a bare branch an inch or so in diameter. This keeps the birds from alighting upon the top of the doors when

they are open and at the same time acts as a "stepping-stone" nearer the trap.

To trap the many different species of warblers, each trap has to be arranged in the natural environment that the particular species most frequent. My four traps are situated about the woods in this manner:

The first trap is located under a large elm tree which is overhung with a thick growth of wild grape vines from the base of the tree to its uppermost branches. This trap is virtually surrounded by a dense growth of underbrush and is the favorite haunt of the Hooded and Kentucky Warblers. The latter is considered a rare warbler in northern Ohio, but it is taken regularly in the late spring and early fall. The Black-throated Green, Connecticut, Mourning, and Wilson's Warblers find this trap to their liking.

The second trap is less than twenty-five yards away from the "grapevine" trap and is located in the center of the woods under the drooping branches of an old apple tree. The undergrowth here is rather light. The Cerulean Warbler always pays this trap a visit whenever it is about the station. This trap is likewise very popular with the Black and White, Blue-winged, and Black-throated Blue Warblers and the American Redstart.

Trap number three is situated in the southwest portion of the woods and fifty yards from the "apple tree" trap. The undergrowth here is very heavy, and the trap is not located beneath a tree, as the other two are. The Tennessee, Magnolia, and Myrtle-Warblers, the Oven-bird, the Northern Yellow-throat, and the Bay-breasted Warbler use this trap extensively.

The fourth and last trap is moved about from the upper to the lower edge of the station according to season. From my observations, the warblers are more common in the northern section of the woods during the spring. This is also true of the other migrants, especially the thrushes. The environment about the trap in its spring location consists of a few young trees and scarcely any underbrush. The warblers trapped here include a number of the common species. In the fall the trap is placed on the south side of *Tsis Kwâhi* in the center of a group of young wild cherry trees about fifteen feet tall, which keep the trap in a deep shadow throughout the day. Many thrushes, flycatchers, and vireos are trapped in this secluded spot. The Nashville, Blackburnian, Black-poll, Pine, and Canada Warblers are the predominating species of warblers trapped. I have tried to illustrate the importance of the location and position of the traps in trapping this delightful family of birds.

All warblers that observe the water are at once attracted to it. The Connecticut, Mourning, and Kentucky Warblers will not enter the trap if there are any birds already in it. They will stay in the vicinity of the trap until all is quiet before approaching. At noon-

time there is a lull in warbler activity, and it is then that most of these ground-feeding warblers are taken.

The use of a warbler for "bait" to attract others of the same or different species to the trap is practiced extensively here during migrations. The bird best suited for "bait" is the female Redstart. She emits a loud chirp when confined in the trap, and this call attracts many different species. The Connecticut and Hooded Warblers also make a loud chirp when trapped, but, being ground-feeding warblers, they pace back and forth in the trap, pushing their bills through the hardware cloth, and injuring the base of the upper and lower mandible in a very short time. The Redstart acts entirely different when in the trap. She climbs about the compartment and therefore can be confined for half an hour without serious results. Warblers on hearing the loud chirps of the "bait" bird are immediately attracted to the sound. Once they are at the trap, they seem to forget entirely about the trapped bird; the water is what then interests them. The "bait" bird stops chirping as soon as another bird is trapped.

The majority of the birds on entering the trap are not alarmed by the closing of the door behind them. Some will pace back and forth for a few minutes and then turn to the water for a drink and a bath.

Strange to say, as yet I have not had a single return or recovery.

The list of species banded during the spring and fall migrations of 1933 and 1934 follows:

Black and White Warbler (*Mniotilta varia*), Golden-winged Warbler (*Vermivora chrysoptera*), Blue-winged Warbler (*Vermivora pinus*), Brewster's Warbler (*Vermivora leucobronchialis*), Tennessee Warbler (*Vermivora peregrina*), Orange-crowned Warbler (*Vermivora c. celata*), Nashville Warbler (*Vermivora r. ruficapilla*), Northern Parula Warbler (*Composthlypis americana pusilla*), Eastern Yellow Warbler (*Dendroica æ. æstiva*), Magnolia Warbler (*Dendroica magnolia*), Cape May Warbler (*Dendroica tigrina*), Black-throated Blue Warbler (*Dendroica c. cærulescens*), Myrtle Warbler (*Dendroica coronata*), Black-throated Green Warbler (*Dendroica v. virens*), Cerulean Warbler (*Dendroica cerulea*), Blackburnian Warbler (*Dendroica fusca*), Chestnut-sided Warbler (*Dendroica pensylvanica*), Bay-breasted Warbler (*Dendroica castanea*), Black-poll Warbler (*Dendroica striata*), Northern Pine Warbler (*Dendroica p. pinus*), Western Palm Warbler (*Dendroica p. palmarun*), Yellow Palm Warbler (*Dendroica p. hypochrysea*), Oven-bird (*Seiurus aurocapillus*) Northern Water-Thrush (*Seiurus n. noveboracensis*), Kentucky Warbler (*Oporornis formosus*), Connecticut Warbler (*Oporornis agilis*), Mourning Warbler (*Oporornis philadelphia*), Northern Yellow-throat (*Geothlypis trichas brachidactyla*), Yellow-breasted Chat (*Icteria v. virens*), Hooded Warbler (*Wilsonia citrina*), Wilson's Warbler (*Wilsonia p. pusilla*), Canada Warbler (*Wilsonia canadensis*), American Redstart (*Setophaga ruticilla*).

The three graphs, Plates 1, 2, and 3, include the spring and fall migrations for the years of 1933 and 1934. I purposely leave out days when there were no warblers banded. This includes a number of days in the latter part of June, most of July, and a few days in early August. At the top and bottom of the graphs I have given the weather and temperature report twice daily for 1933 and 1934.

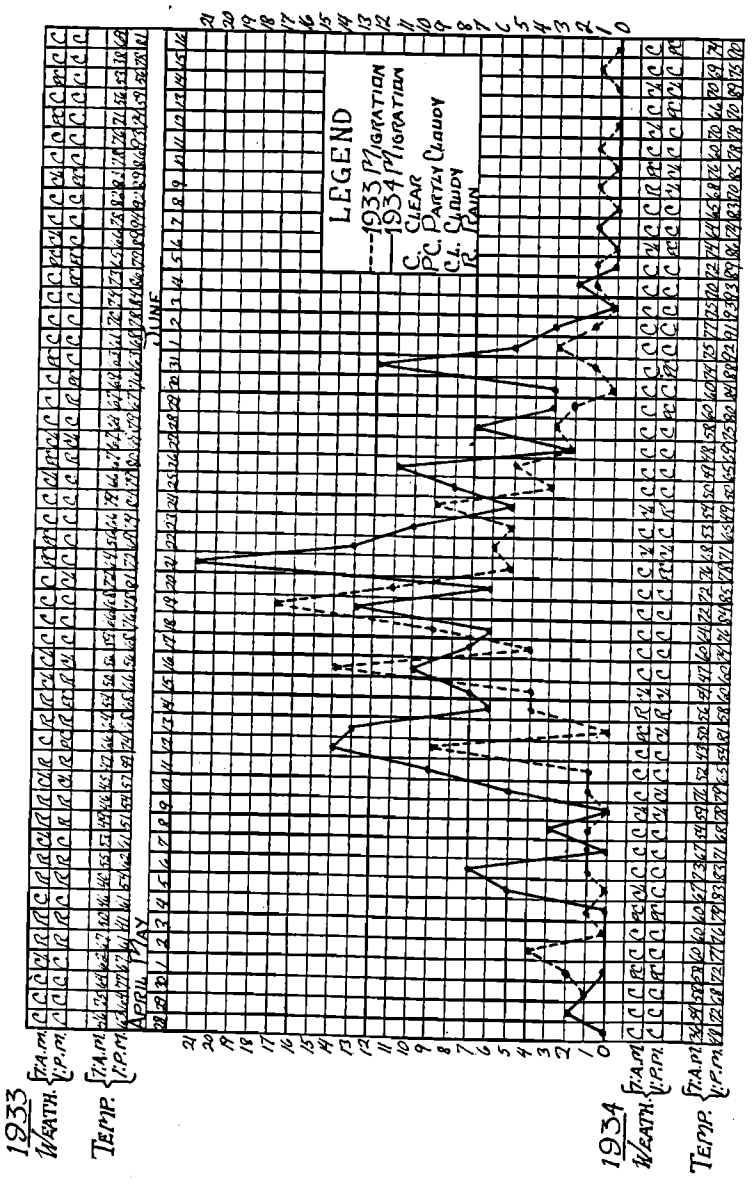


Plate I. Graph of Warbler Migration During Part of April, May, and Part of June, 1933 and 1934.

With this information it is possible to note the number of birds banded in relation to the prevailing weather-conditions. From May 1, 1933, to the 15th, nearly nine inches of rain fell, which made it almost impossible to trap any birds in the water traps. In reply to my query as to the length of the spring warbler migration, Professor Lynds Jones of Oberlin, Ohio, writes: "We have about twenty species that breed in Ohio, some of them, such as the Black and White, Blackburnian, and Magnolia Warblers, nest rarely in some restricted localities. Such are hard to place in any migration list. Most individuals migrate. All transient warblers should be gone before June 10th, and none should return before July 10th. Of course there may be some exceptions, due to bodily conditions or to an accident that hinders flight."

On Plate 1, I extended the spring migration to June 15th so as to include the Magnolia and Kentucky Warblers, which were banded on June 11th and 15th, respectively, in 1933. To the best of my knowledge these two species do not breed anywhere in the vicinity of the station. I believe they were migrants. The Yellow Warbler and Northern Yellow-Throat are the only species nesting about the station. The Yellow-breasted Chat breeds rather abundantly about six miles to the north. It is interesting to note on the graphs how each day's "high or low" of 1933 and 1934 coincides.

Table I gives the spring migrations of 1933 and 1934, showing the species, sexes, and number of warblers banded, together with the sex-ratio for every species as far as possible. Table II gives the fall migrations of 1933 and 1934, showing the species, sexes, and number banded; also the sex-ratio in both the adult and immature birds being included when possible. I trapped my first warblers in the fall of 1932, nearly fifty being taken then. I did not get my two traps in operation until September 10th, and trapped only two days a week. But, in that season I banded twenty-four Myrtle Warblers, and in the fall of 1933 there were twenty-two banded; last fall (1934) I banded but two birds.

TABLE I

WARBLERS BANDED DURING SPRINGS OF 1933 AND 1934

	No. and Sex Ratio			*Sex*
Species	*Ad. Males*	*Ad. Females*	*Nestling*	*Undetermined*
Black and White	10	4	....	....
Blue-winged	4	..	....	....
Brewster's	1	..	....	....
Tennessee	5	..	....	....
Orange-crowned	..	..	....	1
Nashville	..	..	....	16
Northern Parula	..	3	....	....
Eastern Yellow	..	..	6 X	....
Magnolia	30	29	....	....
Cape May	..	1	....	....
Black-throated Blue	3	4	....	....
Myrtle	4	5	....	....
Black-throated green	9	13	....	....
Cerulean	1	..	....	....

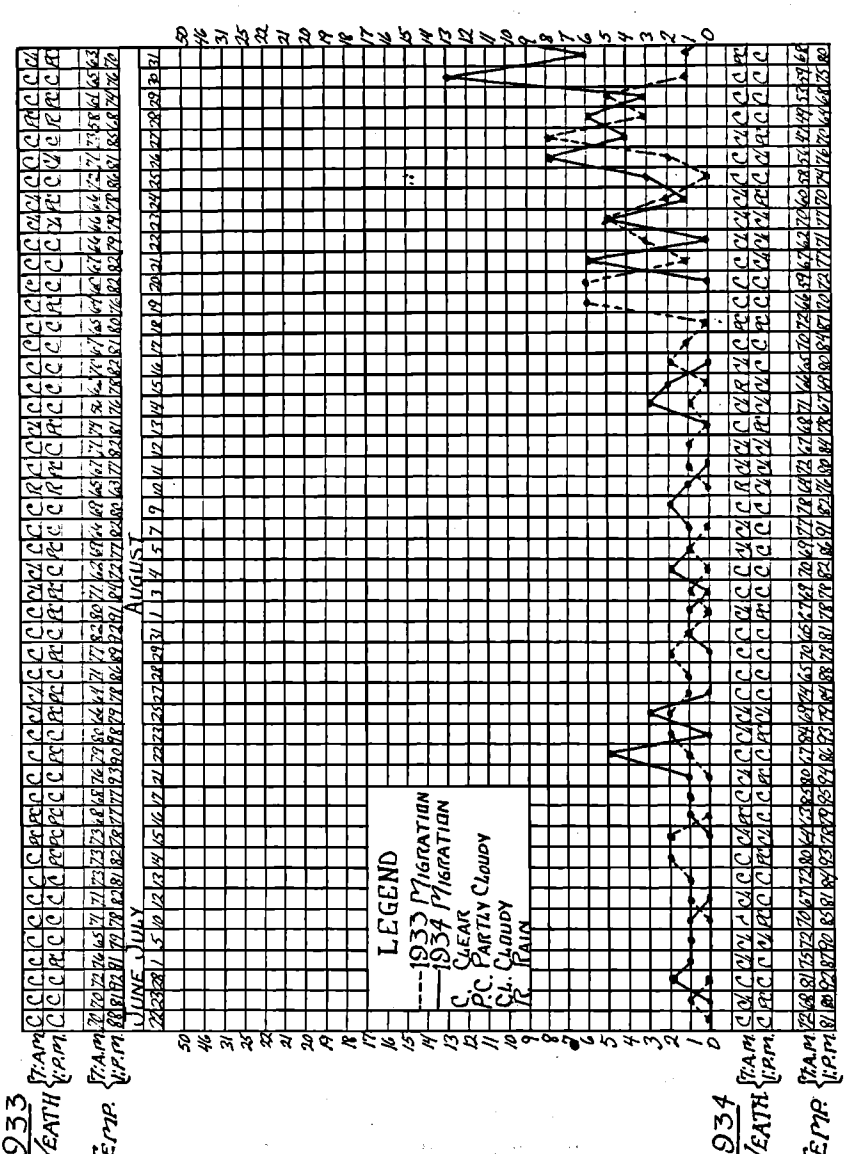


Plate II. Graph of Warbler Migration During Part of June, most of July, and August, 1933 and 1934.

Blackburnian	8	10	....	....
Chestnut-sided	12	14	....	....
Bay-breasted	2	3	....	....
Black-poll	4	2	....	....
Ovenbird	..	..	....	12
Kentucky	3	1	....	....
Connecticut	1	2	....	....
Mourning	11	10	....	....
Northern Yellow-throat	16	12	....	....
Yellow-breasted Chat	..	..	....	3
Hooded	1	2	....	....
Wilson's	10	7	....	....
Canada	15	13	....	....
American Redstart	15	26	....	....

Summary Spring Banding:

Total number banded, 1933	138
" " " 1934	226
	364

"X" = Sex Undetermined.

TABLE II

WARBLERS BANDED DURING FALLS OF 1933 AND 1934

Species	*No. and Sex Ratio* *Ad. Males*	*Ad. Females*	*Immature*	*Sex Undetermined*
Black and White	4	13	5 ♂	....
Golden-winged	1	..	....	....
Blue-winged	4	2	....	....
Tennessee	2	4	64 X	....
Nashville	..	..	9 X	41 A
Magnolia	..	..	8 ♀	55 A
Cape May	..	..	1 ♂	....
Black-throated Blue	5	6	2 ♂ 2 ♀	....
Myrtle	..	..	....	24
Black-throated Green	16	4	5 ♀	....
Cerulean	1	..	1 ♂	....
Blackburnian	7	16	9 ♂ 10 ♀	....
Chestnut-sided	..	..	5 X	11 A
Bay-breasted	..	..	24 X	17 A
Black-poll	..	..	....	89
Northern Pine	4	6	....	....
Palm	..	..	....	2
Yellow Palm	..	..	....	1
Ovenbird	..	..	....	37
Northern-Water-thrush	..	..	....	2
Kentucky	8	8	....	....
Connecticut	..	..	4 ♂	....
Mourning	7	..	7 X	....
Northern Yellow-throat	2	7	7 ♂ 5 ♀	....
Yellow-breasted Chat	..	..	....	4
Hooded	2	..	1 ♀	....
Wilson's	5	6	4 ♀	....
Canada	13	7	4 ♀	....
American Redstart	10	57	34 ♂	....

Summary Fall Banding

Total number banded, 1933	334
" " " 1934	387
	721

"A" = Adult. "X" = Sex undetermined.

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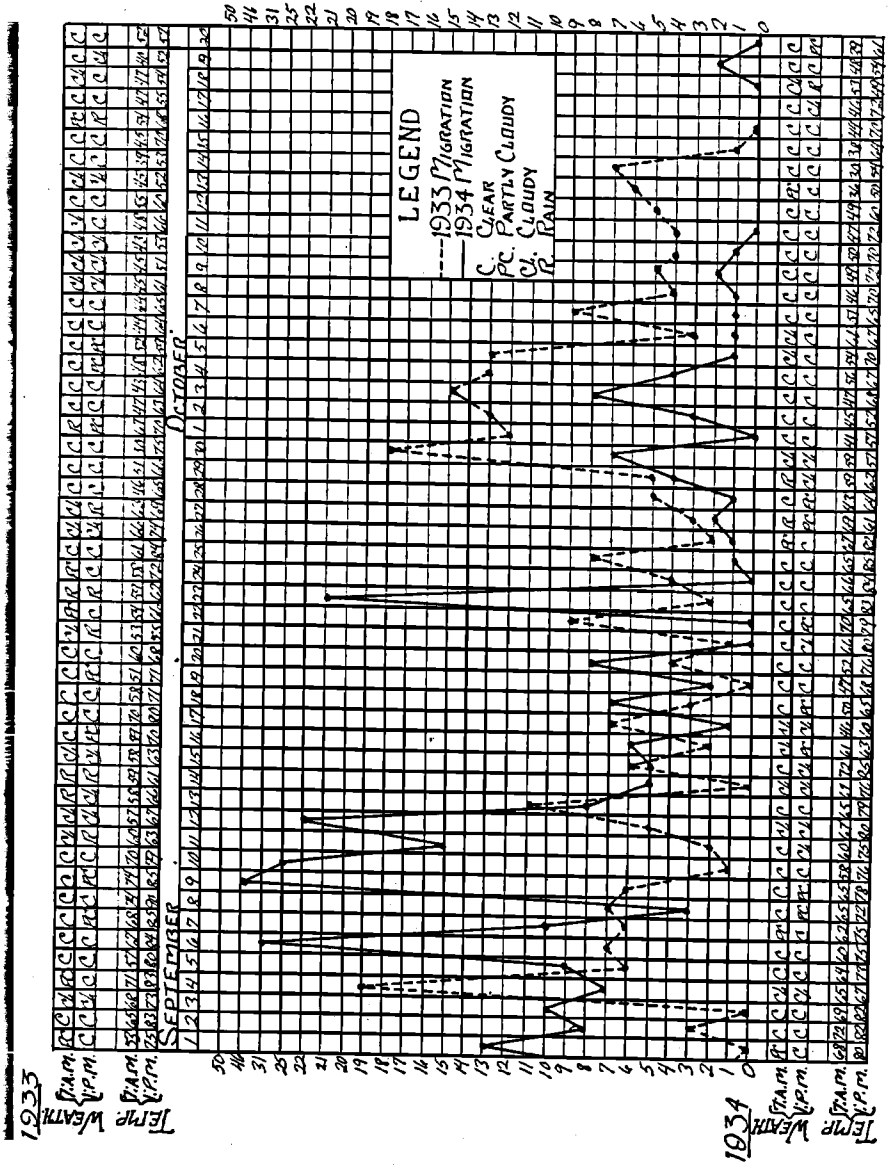

Plate III. Graph of Warbler Migration During September and part of October, 1933 and 1934.