

BEHAVIOR AND LOCAL DISTRIBUTION OF TUFTED
TITMICE IN WINTER AND SPRING

By MABEL GILLESPIE

THIS study is based on data concerning Tufted Titmice (*Beolophus bicolor*) provided by various field observations and banding-notes collected by John A. Gillespie and the author during the past nine years, and by a more specialized study conducted by the author during the winter and spring months of the present year. Practically all the data have been collected in Glenolden, Pennsylvania, and immediate vicinity. Only occasional observations of Tufted Titmice have been made away from this region. In such cases the birds have been always observed in woods, usually near water¹ and are found in groups of from two to perhaps six.

The Tufted Titmouse is described by Ridgway (*Birds of Middle and North America*, Vol. III) as "arboreal, omnivorous, very active and essential non-migratory." A survey of many of the lists of birds of given localities published in various numbers of *The Auk* shows that, so far as the information is given, Titmice are found in thick growth and usually near water.

DESCRIPTION OF THE REGION

Glenolden is eight miles southwest of the Philadelphia City Hall, and two miles north of the Delaware River. The Munckinipattus Creek pursues a tortuous course through the Borough, describing a complete letter S. Twenty-five years ago the section south of the Pennsylvania Railroad (see map) was heavily wooded and was famous because of its abundance of beech trees. The plateau within the long loop of the creek has been cleared and developed, but the slopes of the winding ravine are still heavily wooded and largely unspoiled by development. White pines and cedars, reported by early settlers, have all disappeared. About one third of the trees are beech (*Fagus grandifolia*); a large number are tulip (*Liriodendron tulipifera*), with red oak (*Quercus rubra*) and red maple (*Acer rubrum*) in abundance. White oak (*Quercus alba*), black oak (*Quercus velutina*), tupelo (*Nyssa sylvatica*), white ash (*Fraxinus americana*), black walnut (*Juglans nigra*), and sycamore (*Platanus occidentalis*) are common; with thick

¹Practically all the woodland in this part of Pennsylvania borders the streams. Therefore the presence of water in the habitats of Titmice may be merely adventitious and not essential.

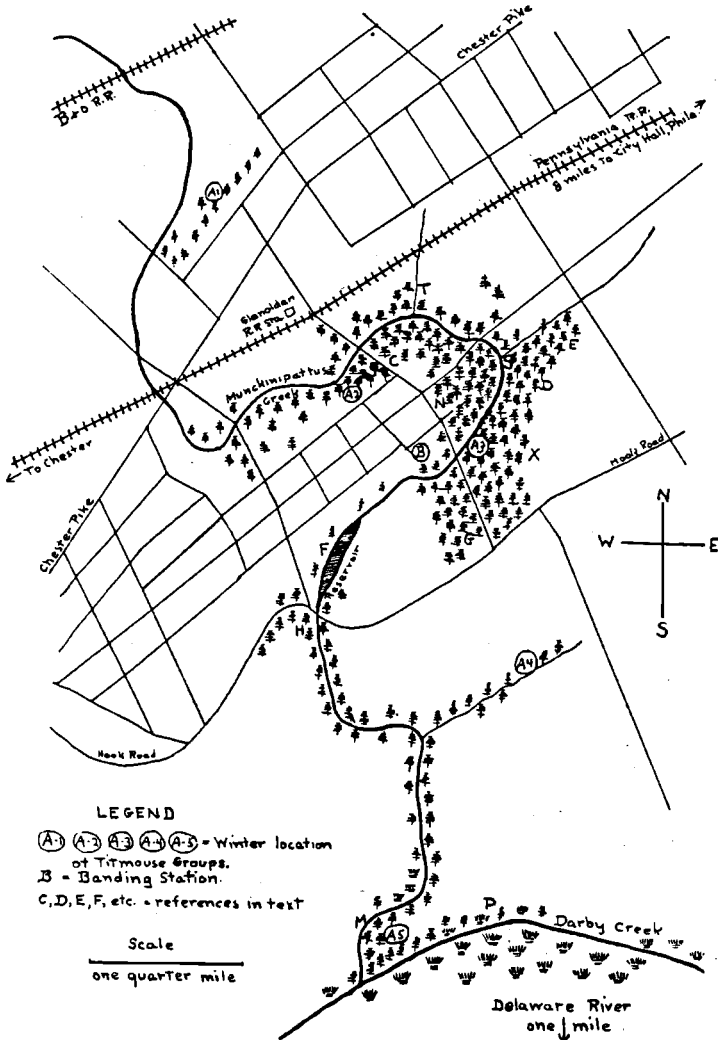
underbrush composed largely of witch-hazel (*Hamamelis virginiana*), spicebush (*Benzoin æstivale*), alder (*Alnus rugosa*), American hornbeam (*Carpinus caroliniana*) and various viburnums.

From the railroad to the bend of the long loop the southern slope of the creek valley is very precipitous, while for nearly a half a mile from this point to the southwest both slopes are particularly steep. Where the valley widens there is a semi-artificial reservoir just above the tidewater limit. To the east and south are extensive truck farms. In the open regions on both sides of the Borough are numbers of "hedgerows" of Carolina poplars (*Populus deltoides*), and along the tiny stream north of Darby Creek is a thicket of sweet gum (*Liquidambar styraciflua*). Along Darby Creek, which flows through extensive marshland, are pin oaks (*Quercus palustris*) and Spanish oaks (*Quercus falcata*) in addition to trees already mentioned, and in the marshes thorns (*Cratægus sp.*) grow abundantly. But the trees are isolated and scattered here, and except at the confluence of the two creeks there is no wooded section. Titmice are never seen in the vast marshy section south of Darby Creek.

This region, situated along the theoretical migration highway of the Delaware Valley, combining forest, meadows, streams and marshes within a little over a square mile, is the most favorable limited area for bird-study in the entire Philadelphia region. Because of this fact it may appear that the Titmouse population would be denser here than usual. However, as will be shown, during some years Titmice are very scarce, while during the season of 1929-1930 they have been reported as common generally throughout the Philadelphia region. Within this region are found commonly such characteristic birds of the Carolinian faunal zone as the Cardinal, Carolina Wren, Yellow-breasted Chat, and Kentucky Warbler, as well as the Tufted Titmouse.

Just how much ecological relation there is between the flora of any region and the presence of Tufted Tits remains to be seen, but it is noticeable from the Christmas census returns in *Bird-Lore* that in a number of cases Tits are not noted in lists that include other characteristic resident members of the Carolinian fauna such as Cardinals and Carolina Wrens. Florence Merriam Bailey² gives an example of the absence of Tufted Tits from a region where the tree growth was not such as to provide suitable hollows for nesting-sites.

²*Bird-Lore*, Vol. XV, p. 394.



MAP SHOWING REGION ABOUT GLENOLDEN, PA.

ANALYZATION OF BANDING DATA

As above noted, Tufted Titmice are essentially non-migratory birds, and during the winter season their territories are rigidly limited. In some winters they are common, in others they are seldom seen. They wander considerably during early spring and in the fall, keeping together in small groups.

The accompanying chart shows clearly the characteristic appearance and disappearance of Titmouse groups, and the alternating abundance and scarcity of the species. The vertical lines in the section marked "daily reports" indicate the number of times particular mention was made of Titmice in the daily journal of field observations. The vertical lines opposite the band-numbers indicate the times each banded bird was actually caught. A horizontal connecting line indicates the duration of a bird's known existence.³ As will be explained later, Titmice are very clever in escaping from traps, so these marks do not adequately indicate the frequent presence of Titmice about the banding station. Bird-banding was not begun until the fall of 1922, otherwise Titmice must surely have been trapped in 1921-22.

The daily journal is based on notes of observations made at the banding station (in many cases from within the house), from field observations on short walks taken at least once a week (usually more often), on longer walks taken every week or so, and from the results of general censuses taken four or five times a year over an area of several square miles. Censuses were not taken in 1922 and the early part of 1923. These observations, by the way, were made as a matter of course, with no idea of this special study in mind. On every census Titmice were observed somewhere within a mile or so of the banding station except in December, 1926, and May, 1927. However, since there were scattered reports of them in other months of these years, the likelihood is that they were present somewhere, even though not noted.

It will be observed that Titmice were constantly present during the winter season (October-April) in 1921-1922, 1923-1924, 1925-1926, and 1929-1930. During these seasons (1921-1922 excepted) they were trapped in numbers varying from five to ten. During each of the winters of 1924-1925, 1927-1928, 1928-1929, a group of Titmice wintered in the vicinity, but its members were not commonly found about the banding

³This graphical method has been adapted from the similar method used by Rudyerd Boulton and John T. Nichols in *A Method of Analysing Bird-Banding Data. Bulletin of the Eastern Bird-Banding Association. No. 2, October, 1925.*

Month	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A				
Year	19	21											19	23										19	24			
Daily Reports																												
120353 (cont. below)																												
120355																												
123926																												
122949																												
122973																												
Year	19	24											19	26											19	27		
Daily Reports																												
120353																												
167631																												
167632																												
167634																												
167655																												
Individuals taken once																												
Year	19	27											19	28												19	30	
Daily Reports																												
A126442																												
A126454																												
A126452																												
A126453																												
A126455																												
Individuals taken once																												
Month	5	0	N	D	J	F	M <td>A</td> <td>M</td> <td>J</td> <td>J</td> <td>A</td> <td>S</td> <td>O</td> <td>N</td> <td>D</td> <td>J</td> <td>F</td> <td>M</td> <td>A</td> <td>M</td> <td>J</td> <td>J</td> <td>A</td>	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A				

CHART GIVING DATA ON TITMICE GROUPS

station. Sometimes a Titmouse would be observed feeding on suet, and once in February, 1929, a Tit was seen escaping from a trap, but in no case was even a single straggler caught. If one member of a group establishes the habit of coming to the traps, it seems to be inevitable for the rest of the group to follow.

During the winter of 1922-1923 no Titmice were reported, and during 1926-1927 Titmice were reported but four times. Their history for both of these seasons indicates either unusual wandering or a high percentage of casualties.

The fact that the records of the journal of field observations and the banding data correspond so consistently indicates, (first) that Titmice stay rather permanently within somewhat limited areas during the winter, and (second) that when a banding station lies within or near one of these limited areas, there is every possibility of trapping all the members of the group.

If Titmice had been caught in 1927-1928 there would be a perfect alternation of years of abundance and scarcity from the point of view of our banding station locality. In this connection a cursory survey of our observations prior to 1921 when written records start is of interest. We began ornithological observations in Glenolden in the fall of 1918, and in the fall of 1919 saw Titmice for the first time. During the fall and winter of 1920-21 no Titmice were observed. These early observations were quite local, and thus add weight to a theory of yearly alternation. In this connection it will be noted that No. 120353, the only Tit whose history is known for more than one season, was trapped in 1923-1924, and again in 1925-1926, skipping the intervening season. This theory suggests that Tits do not necessarily return to the nesting-territory of the previous season, and that although they are essentially non-migratory, yet they are local wanderers between seasons.

More striking is the suggestion of a four-year cycle culminating in unusual abundance, followed by a marked scarcity in numbers.¹ There is here possibly an example of the phenomenon suggested by Julian Huxley² of a three-and-seven-tenths-year cycle which is just one-third of the familiar eleven-plus sun-spot cycle. Huxley has very convincing data to prove the influence of the sun-spot cycle on population density and scarcity among various species of wild life. His

¹During February, 1926 there is a considerable lapse in our records, so the chart is probably misleading for the month.

²*Mice and Men, Harper's Monthly Magazine*, Vol. 156, Dec., 1927, pp. 32-50.

theory, in brief, is that the meteorological conditions of the earth caused periodically by sun-spot maxima make for increased productivity of plant life. As a result the growth of small herbivorous animals is stimulated, followed by an abundance of the predatory animals. The resulting population density is attended by epidemic disease which reduces the numbers of a given species to a minimum, and then the cycle is repeated. The average length of the cycle is either just over eleven years, or else one third of this. It will be noted that the chart shows a remarkable scarcity of Titmice during each season following the years of abundant increase. In view of these facts, one is tempted to predict a scarcity of Titmice near Glenolden during the coming winter season.

BEHAVIOR AT BANDING STATION

In no cases do birds of various species show contrasting behavior to better advantage than in their reactions to traps. Birds of some species are notoriously clever at escaping from traps, while those of other species become hopelessly bewildered when trapped. And it must not be forgotten that within a species there is considerable individual variation as to reaction.

Of all the species which we have observed in any detail in connection with traps, the members of none present more intelligence and individuality than Tufted Titmice. During the winter of 1929-1930, a group which has already been mentioned was repeatedly about the banding station. Of the six which seemed to constitute a family group³, two were not recaptured, one was taken twice again, two were captured five more times, and one six times. Besides this group of six there were four stray individuals, one of which, No. A126442, was banded October 31, 1929, repeating fourteen times up to February 14, 1930; while the other three appeared in the early spring.

The number of captures, however, gives no adequate idea of the frequency of repeats. Probably not a winter's day passed that one if not all of this group failed to enter the traps for food. We used a regulation government funnel trap, a round house trap, an oblong funnel trap, a flat trap operated sometimes by a pull-string but more often by an automatic trigger, and a suit-case trap operated by a pull-string. With

³An elaboration of the theory that small groups of birds represent family units is presented by Charles L. Whittle in *Some Aspects of the Group Habit Among Birds*, *The Auk*, Vol. XL, No. 2, April, 1923.

but one or two exceptions, our only success in capturing a Titmouse after the original capture was to secure it in a pull-string trap. The Tits learned very quickly how to find their way out of the other traps. Dozens of times I have watched from a window, and usually the bird under observation picks up a bit of food and at once flies out, with no time lost in searching about for the entrance. From a convenient tree near by the bird usually eats the morsel, and then returns to the same trap or to another for more food. I have seen one fly with its bait from the interior of the oblong funnel trap to the top of the government funnel trap, there to partake of its feast. The moment it had swallowed the bait, it dropped quickly to the ground directly in front of the funnel entrance, entered, picked up another morsel, and was out again in record time. So quick are the actions of Titmice in most cases that even when they enter a pull-string trap it is extremely difficult for the operator to act quickly enough to make a successful capture.

Incidentally, the appetites of Titmice seem insatiable. Accurate comparisons are, of course, impossible, unless the actual food requirements of a Titmouse could be determined for an entire day. But Titmice eat far more from the feeding stations and trap bait than birds of any other species. A great deal is consumed on the spot, and some is carried away.

It is often possible with birds of other species that "learn the combination" of traps, to confuse them when they are within a trap by running toward them. They usually flutter hopelessly about instead of collecting their wits and finding the exit. This scheme does not work with Titmice, however. Approaching danger seems only to stimulate their keenness and composure, for they most containedly and successfully seek the exit at the first hint of hazard.

This ability to find both entrance and exit without hesitation or search is apparently due to accuracy of memory. The following incident substantiates this theory. During one night there was a fall of very soft snow, with a succeeding drop in temperature. The traps were all removed but one lest they should become frozen in the ice crust. After the freezing the outline of each trap was clearly visible in the crust. A Titmouse was seen to fly to the ground at the spot directly in front of the outlined mark of an entrance funnel. This showed that the bird clearly remembered the location of the funnel. Then, however, just as it was about to run forward, it appeared to realize that the trap was not there. The food was directly in front of the bird with no intervening obstruc-

tion. Yet the bird hesitated, looked about, and observed that another trap was in its accustomed place. It flew to this trap and entered for food.

No. A126442, above mentioned, never seemed to acquire the ease in escaping from traps manifested by the members of the group that appeared later. According to the records, it was taken in the round-house trap three times, in a pull-string trap once, in the oblong funnel trap five times, and six times in the government funnel trap. Once it was observed in the oblong funnel trap for fully a half-hour, feeding contentedly. Then it found the way out without difficulty. At this time it flew into a sheet hanging on the clothes-line and dropped to the ground, stunned. An attempt was made to pick up the bird, but it flew weakly about in circles and finally lit on the branch of a tree, beyond reach. In nine days the bird was captured again, none the worse, apparently, for this experience. During the last week it was handled, it was frequently taken away from the station for release, and though it returned from short distances, it has not been seen since the last release some miles away. As the mating-season was at hand, it would be likely to stay wherever it could find companionship.

The last week in February I started to use colored celluloid bands in order to be able to distinguish individual birds at sight. The method of preparing these was suggested by Wilbur K. Butts. No. A126452 had a red band placed on the left tarsus, and, though subsequently captured but once, was observed about the banding station and in the traps on ten days in March and on one day in April, being seen several times on some days. This shows more conclusively than ever the persistency with which these Tits came to the traps. It must be remembered, moreover, that such data depend on getting a good enough view of the bird to see the colored band, which is difficult with such active, restless birds. Two other Titmice, with colored bands on the tarsi, were also seen on succeeding days.

C. McCoy Franklin, of the Crossnore School, North Carolina, who speaks on the birds of that region, believes that Titmice stay mated for life. He has had the opportunity to observe birds closely, albeit unscientifically, and he did not make the claim about birds of any other species. Therefore the statement, though unproved, is challenging, indicating that from the observed habits of Titmice permanent mating seems more probable than among many other species. The tendency of these birds to remain in probable family groups would keep a

mated pair together until time for another mating. Exactly what happens then remains to be discovered.

Further manifestations of the group habit are shown in the tendency of Titmice to "stand by" when one of their number is in difficulty. As already mentioned, it is seldom that a Titmouse is unable to leave a trap, but when one fails to get out there is almost always another Titmouse near by (usually but one), calling excitedly, and waiting for its comrade. Often the concerned Titmouse will perch on the top of the trap in which its comrade is imprisoned, and it will continue to call until the captured bird is released.

This habit would seem to indicate true courage, for Titmice, in this region at least, are nervous, wary creatures.¹ I find it possible to watch birds of most species from a window since the birds are not alarmed as long as I remain motionless. A Titmouse, however, will see a human being every time unless there is a concealing sash curtain, and it will detect motion behind a curtain, and in either case it flies away instantly.

WINTER DISTRIBUTION

During the late spring, summer, and early fall, Titmice tend to disappear. This disappearance indicates a period of retirement during nesting and the subsequent annual molt. At this season the birds are in the secluded depths of woods and are unaccustomedly silent. In the fall they appear in small groups, which, as far as they can be counted, vary from two to at least six. Presumably there is more or less wandering at this time, but the tendency apparently is to choose a favorable location in which to spend the winter, and then to remain within a rather limited area.

The group habit and limitation of wanderings are clearly illustrated by our records. It has already been noted that, during some winters when Titmice were reported rather consistently from the field, they were not trapped. In the past winter the group of six, a probable family group, appeared late in December, and were all captured between the 26th and 30th, four of them being recaptured at intervals. This group had a very definitely limited winter area. To the southwest of our banding station the slope of the ravine and the bottomland are covered with but low second growth and underbrush, and

¹So far I have had no experiences of intimacy with Titmice such as have been reported by various observers. See *Bird-Lore*, Vol. VI, p. 205, and Vol. XXVII, p. 180, for accounts of Titmice that pulled hair from human heads for nesting material; also Vol. VII, p. 21, and Vol. XV, p. 173, for accounts of Titmice that took food from the hand.

the Tits have never been observed there in winter. To the northeast the creek flows nearly straight for a quarter of a mile. An embanked road crosses the ravine midway of this distance at right angles to the creek. The creek and road thus divide nearly a quarter of a square mile into four sections of varying areas. Our section, which is not heavily wooded, is the western one. The southern section directly across the creek is very heavily wooded, but the Titmice were not seen there during the winter. Instead they flew from our banding station across to the two wooded slopes to the northeast of the embankment, and at any time when they were not near the banding station, might be found within an area less than a quarter of a mile in diameter with its center at A3. It seems rather likely that they wandered beyond what would otherwise have been their area limits in order to secure food at the banding station, since they did not roam as far from A3 in any other direction.

Further observations of the distribution of Titmice come from the notes of field observations during the fall and winter of 1929-1930. Four other groups of Titmice were found within the range of fairly frequent field trips. With the exception of the Tits at A3, the members of the other groups were unbanded as far as could be observed.

Half a mile to the northwest, the creek flows parallel to the present limit of settlement on the other side of the Borough. Here there is a narrow strip of timber with thick undergrowth between the houses and the creek, and meadow beyond the water. On every occasion when we visited this region in the winter months, a group of Titmice was observed within the same restricted area (A1).

Two blocks to the northwest of the banding station at least two Titmice were regularly observed. This area (A2) comprises thick woods along a steep slope.

Nearly a mile to the south of the banding station the creek joins the larger Darby Creek, each stream being thinly bordered by trees and rather wild undergrowth. During the past winter Titmice were always seen or heard in the vicinity of this confluence (A5).

Half a mile to the southeast of our station a very small stream flows through cultivated fields. At one point along this stream (A4), which is very narrowly bordered by trees and shrubs, we never failed during the past winter to observe Titmice, usually about four.

These groups, together with the banded Titmice at A3, constituted five groups, definitely located for the winter. No stragglers were observed elsewhere in the above-described

region during the winter season, and no groups had territories that overlapped.

A check on this winter count of Titmice came from three members of the Delaware Valley Ornithological Club who one morning covered the territory within which these five groups were located, and who reported a total count of twenty or more Titmice.

SPRING WANDERING

The preliminary activities of the mating-season start early with non-migratory birds of the Carolinian fauna. A Titmouse was first heard in full song on January 5th of this year, though the temperature ranged from twenty-four to forty degrees. The song season was fully established by the end of January, and it increased in intensity each day. By the middle of February, Titmice were very noisy, and started singing in the morning before it was fully light.

At about this time there came intervals of two or three days when Titmice were not observed at the banding station, and at about the same time they were found in territory outside their circumscribed winter areas. On March 7th a Tit was observed in the shrubbery at F. On the 9th a group was seen between M and H. On the same day several Tits were seen at F, and one new one was trapped. By the middle of March they came to the banding station only at breakfast time as a rule. On March 22d, when it was unusually cold with a high wind, there was no sight nor sound of a Titmouse all day. The following day a new one was trapped.

On March 30th I thoroughly surveyed all the territory south of the Pennsylvania Railroad, starting at 6.45 a.m. Titmice were observed at D, B, H, M, P, and midway between H and M. On April 4th most of the same territory was covered and Titmice were observed only at M. On April 5th the territory between the railroad and Hook Road was covered and Titmice were observed only at E and B. No Tits were observed during local investigations on the next two days, but on the 8th they were heard at A3. They were heard about the banding station on the 9th, and on the 10th one was about the banding station frequently during the day. On the 11th I covered most of the territory south of the railroad, and discovered Titmice at H and M. On April 13th two were found at E. On the 15th one was heard below F. On the 19th two members of the Delaware Valley Ornithological Club covered the territory south of the railroad and reported Titmice at A3 only. On the 20th they were heard about the banding station

at 7.30 in the morning. On several days following one was heard at S. On several days during late March and April they were heard near G. The territory at A1 was visited briefly about eight times. Sometimes Tits were heard near by, but more often not.

The data of the foregoing paragraphs are sufficient to indicate a restlessness among Tufted Titmice in the spring, and a wandering, which, though local, is striking compared with the limited areas of winter, or compared with the permanent areas of Cardinals, for instance. There is more, however, than the abandonment of winter territories to be considered. Spring undoubtedly brings about a radical change in Titmouse diet. According to the United States Department of Agriculture, this diet is 66.57 per cent animal and 33.43 per cent vegetal. According to Forbush ("Birds of Massachusetts and Other New England States") the animal diet consists largely of caterpillars and wasps, but includes some larvæ, scales, and eggs. Only the three latter could be obtained in winter, and the diet then must necessarily be composed more largely of vegetable matter. The latter consists (Forbush) of wild berries, seeds, and the softer-shelled nuts and acorns. Thus the winter diet would bring Titmice nearer to the ground and more frequently into the open than the summer diet. The latter would be found to advantage in the treetops.

Among foods listed by Florence Merriam Bailey (*loc. cit.*) are beechnuts, acorns, and berries of the dogwood and Virginia creeper. This locality provides plenty of beechnuts and acorns while Japanese honeysuckle (*Lonicera japonica*) berries and alder seeds are favorite bird foods in place of the berries of dogwood and Virginia creeper, which are much less common. Also the seeds of tulip-tree pods are much sought as food. In the winter Titmice may be observed feeding both in the treetops and near, if not on, the ground. At this time they can be tempted by suet, nuts, soda crackers, and sunflower seeds at feeding stations. During the spring they take to the treetops and seldom come down. The one capture in May, 1924, and the two in June of that year can perhaps be explained by the necessity of feeding young birds.

As a further example of the change in diet, corresponding to changes in season and habitat, is the fact that the Tits wintering at A4 spent their time in a thicket of sweet gum trees that could not, by any stretch of the imagination, be considered real woods. They even wandered out of the thicket and were more frequently found a few hundred feet away in the alders and weeds along the tiny stream. But they were

never seen anywhere along this stream after the period of spring wandering had started.

The nesting and summer activities of Tufted Titmice provide a study upon which little data have been obtained, largely perhaps for the reason that adequate observations are extremely difficult. Although I found Titmouse wary during the winter, they were noisy and not secretive. After mating a decided change takes place. Their calls are rarely heard, they stay high in the trees and are well hidden by foliage, and they defy attempts to follow their movements. Their territories are fairly extensive and they move swiftly from one end to the other, making it impossible for an observer to keep up with them. They are perfectly aware of the presence of human beings, and though they may call before one enters and after one leaves the woods, they will be silent for hours while one waits.

Two facts will indicate more definitely the elusiveness of Titmice in late spring and summer. First, it has been brought to my attention that one of the most active egg-collectors in the Philadelphia region has never succeeded in finding a Titmouse nest. Second, it was not until after the start of this year that I realized the possibilities of the data presented in this paper and resolved to pursue a more intensive study of Titmice; and yet, with a far greater expenditure of time and effort, I have acquired practically no data on nesting activities. A pair occupies the territory between A2 and T, another pair the territory between N and E, and a third roams between X, G and B, but no nests have been located.

CONCLUSION

The organic environment influences the presence and extent of Titmouse population. Titmice are definitely birds of the woodland and must find adequate food and nesting-sites in their chosen habitats.

Banding data and field observations correspond rather consistently to indicate the presence or absence of Titmice. The results of twelve years' observations show a tendency toward alternate years of presence and absence about the banding station or near vicinity; and a peak of population density every four years, followed by a scarcity of numbers.

Titmice are extremely quick in action and clever in emergency; they are social in small groups, and in this locality are very wary of human beings.

Their territorial distribution varies with the season. In

winter small groups suggesting family units occupy very definite and limited areas, never overlapping. Early in March they become restless and wander considerably, prior to mating and nesting. Change in diet effects their habits still further, keeping them in the treetops in spring and summer, but bringing them nearer the ground for seeds and about feeding stations in winter.

A study of the nesting and summer activities of Titmice offers a fascinating challenge for the future.

Glenolden, Pennsylvania, May 30, 1930.

A LIST OF THE ACTIVE BANDING STATIONS
IN THE TERRITORY OF THE
NORTHEASTERN BIRD-BANDING ASSOCIATION

By CHARLES B. FLOYD

THE object of this paper is to acquaint the readers of *Bird-Banding* with the locations of the active banding stations in the territory covered by the Northeastern Bird-Banding Association; to enumerate any special or general work that coöperators are undertaking, and to list the species that are most abundant about each station.

It is obviously impossible to record everything of interest concerning each station, and it is hoped that no readers will feel slighted because only occasional comments on their work are made.

A glance at the accompanying map shows at once the need for more banders in all parts of the territory of this Association, and particularly in the probable migratory highways where there are now almost none. If the valleys of the Connecticut and Merrimack Rivers, for instance, were dotted with banding stations, it is believed that much information regarding migration could be gathered. The writer particularly wishes to impress upon those who are interested in the work but who hesitate to undertake it because they feel that what limited time they can devote to it would not be sufficient to accomplish things worth while, that more collaborators are needed, however little or much they can do. It often develops that a bander becomes so interested in the operation of a station that his affairs can be rearranged so as to permit giving more time to this work than at first seemed possible.