

# DISPERSAL AND FLOCKING OF MARKED YOUNG ROBINS (*TURDUS M. MIGRATORIUS*) AFTER FLEDGING

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## INTRODUCTION

The phenomenon of Ortstreu (orientation to the place of birth) has been well documented in many birds, including the American Robin (*Turdus m. migratorius*). We have presumed that early learning about the environment is the mechanism by which the instinctive capabilities of Robins and other birds are directed. With this in mind we have examined the movements of Robins during the post-fledging period.

Among the birds in which Ortstreu has been studied is the Pied Flycatcher (*Muscicapa h. hypoleuca*). Curio (1958) found that 10 percent of 710 Pied Flycatchers banded as nestlings returned to the same 1,800 acre study area the following year, and that one-third of this number returned within 2.5 miles. In Kluijver's (1951) study of the Great Tit (*Parus m. major*), the majority of the first-year birds nested within 800 meters of their birthplaces. Werth (1947) made a similar study of the English Blackbird (*Turdus m. merula*) and Song-thrush (*T. e. ericetorum*), both closely related to the American Robin. In the case of the Blackbird 93 percent of 157 birds recovered as breeders, which had been banded as nestlings, were found nesting within five miles of their birthplaces. The Song-thrush was only slightly less home-oriented, and 83 percent of 126 similarly banded first-year adults were nesting within five miles of their birthplaces.

A study of the homing tendencies of the American Robin was made by Farner (1945). He stated that "there is a marked tendency among Robins to return, as breeding birds, to their birthplace or its immediate vicinity." From a sample of 428 Robins banded as nestlings and recovered as adults, he found that 92 percent returned to breed the following seasons within 25 miles of the place where they had been banded. In an earlier study, Hickey (1943) used records of 61 Robins that had been banded as nestlings and recovered in subsequent years by non-banders, thus assuring a representative sample. Fifty-four percent of these birds were found within one mile of the place of banding, and an additional 20 percent were found from one to ten miles away.

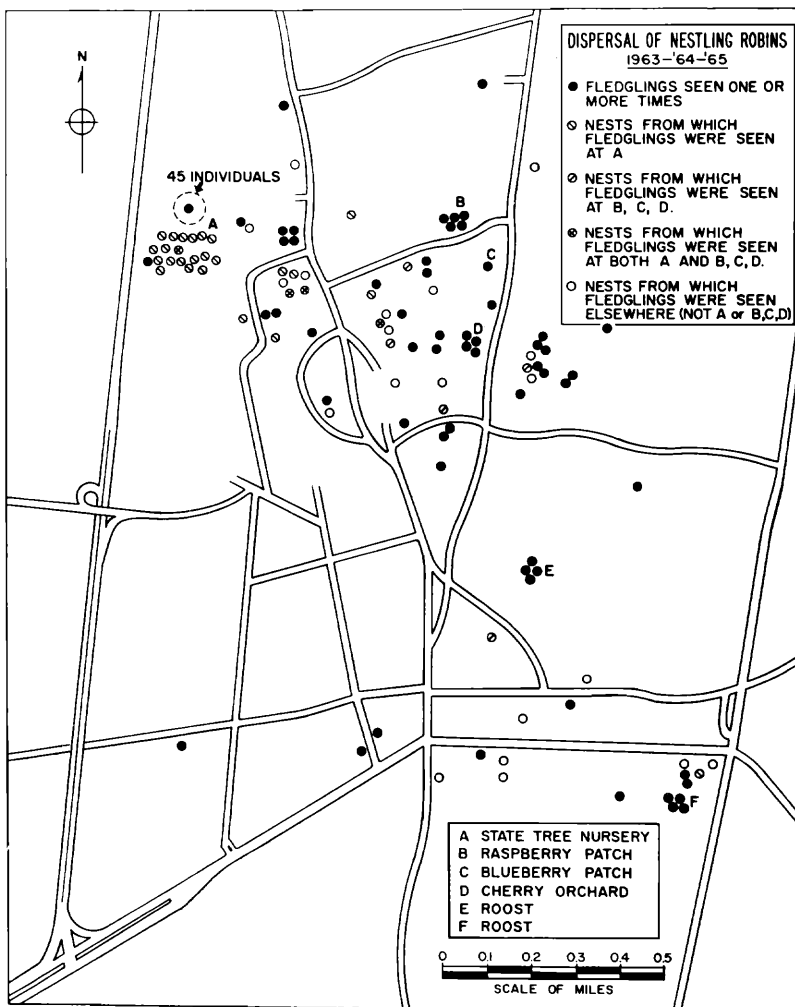
Despite the number of studies which have been made of the return of adults to their birthplaces, we know of very little information

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Figure 1. Map of Amherst, Mass. showing observations of fledgling Robins and location of nests from which they fledged.



on the dispersal of young birds in the interval from fledging to fall migration. Experience gained in this period probably is responsible for establishing the behavioral patterns evidenced in Ortstreu. Kluijver (*op. cit.*) noted that the distance that fledgling Great Tits were led from the nest by their parents was approximately equal to the distance from the birthplace that the majority of first-year Great Tits established their own nests. Recoveries of banded young for 12 weeks after leaving the nest were reported by Werth (*op. cit.*). She found for the Blackbird and Song-thrush that 70

and 55 percent respectively of recovered birds were still in the vicinity of the nest after 12 weeks and that an additional 15 and 18 percent respectively were within five miles of their birthplaces. Although these species are closely related to the Robin they do not necessarily represent analagous situations, because both are only partially migratory.

Our study is the result of three years of observations of the movements of tagged Robins from the nest until fall migration. The study was supported by the Agricultural Experimentation Station, University of Massachusetts at Amherst, Massachusetts with Hatch and Cooperative Regional Research funds. The data were gathered by the first two authors in the course of graduate study.

#### MATERIALS AND METHODS

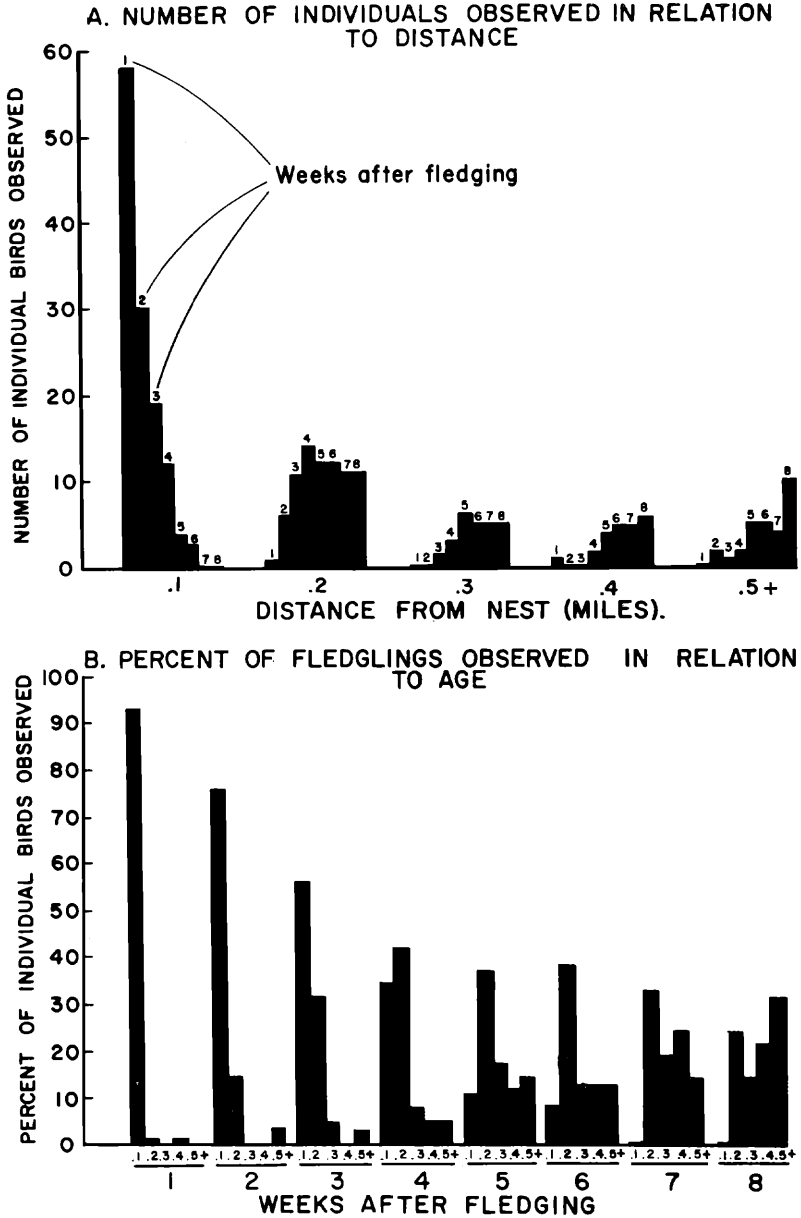
We conducted this study in the "town" of Amherst, Massachusetts (Fig. 1), an area encompassing a small business district, school and college campuses, residential districts, agricultural land and woodland. The area was about 25 square miles, although our study was concentrated on about one-third of this area.

One hundred and eighty-three nestling Robins were marked during the summers of 1963, 1964, and 1965. This was done with U. S. Fish and Wildlife Service leg-bands and with plasticized cloth wing-tags (Hester, 1963). The tags were roughly circular with a diameter of one and one-half inches and were attached to the bird by an aluminum poultry clip inserted through the patagium. All tags were "rocket-red" and had combinations of letters or numbers painted on them for individual field identification. As far as we could determine there was no impairment of physical abilities or behavior of tagged birds. Hester (1964) reported that he wing-tagged 125 nestlings in 51 successful nests from which 130 birds fledged (2.56/nest). Hirth (1966) found 14 of 117 tagged nestlings did not survive to fledge and that the fate of 35 others was unknown. These data are similar to those reported by Howell (1942).

Observations of tagged birds were made with a spotting scope equipped with a twenty-power, wide-angle eye-piece and mounted on a rifle stock for ease of handling. Individual birds could be identified at ranges up to 100 yards. One or both tags usually lasted as long as the birds were under observation, although we know some tags were lost between fall migration and return the following spring.

Thirty-nine birds tagged as nestlings were known to have died on the study area. Unfortunately, it was not possible to estimate accurately the age of the bird when it died often enough to provide a mortality rate for these birds during the first few months post fledging.

Figure 2. Movement of fledgling Robins in relation to weeks post-fledging and distance from nest. Distances (in miles) in Part B are shown at the base of each bar.



## RESULTS

One hundred and six of 183 nestlings tagged over three years in this study were observed after fledging. The dispersal of these birds was plotted graphically for an eight-week period (Fig. 2). These show the expected gradual movements of these birds away from the nest in this time. At the end of three weeks the largest number of birds was still to be found near their parents' territories, or within 0.1 mile of the nest. Between four and six weeks after fledging most of the birds had moved only 0.2 miles from the nest. After eight weeks 27 percent of the 30 birds still under observation remained about 0.2 miles from the nest and 33 percent had moved 0.5 miles or further.

The length of time that individual fledgings remained within or close to their parents' territories was quite variable. In spite of the conspicuousness of the tags, some individuals were difficult to observe at frequent intervals, but it was possible to observe dispersal among fledgings seen reasonably often. Ten young birds from nests within a one-fourth acre area on the University of Massachusetts campus, presumably influenced by similar environmental conditions, remained for an average of 14.5 days near the nest site in 1965. The length of time varied from five to 32 days. One individual disappeared after five days and was seen again a month later 0.4 miles from the nest. Considerable variation was observed even among nestmates. In one instance, two members of one brood left the territory after 13 days, while a third remained there for 32 days. In another case, three nestmates remained eight, 11, and 22 days in the vicinity of the nest.

Werth (*op. cit.*) presented data in tabular form on the dispersal of young Blackbirds and Song-thrushes from their natal areas. A comparison of her data with our own indicated that the rate of dispersal from the vicinity of the nest was about equal in all three species. Small differences which do exist may reflect differences in sampling techniques or in availability of food. Kale and Jennings (1966) color-marked a group of immature Mockingbirds (*Mimus polyglottus*) feeding in a swamp near St. Petersburg, Florida and followed their movements after the source of food, which had initially attracted them, was used up. The majority of these birds moved less than five miles and the furthest sighting was 11 miles away.

We do not know how all young Robins find their way to feeding areas. Concentrations of feeding and roosting Robins during the summer have been recorded by many observers. These flocks are often composed of many young and lesser numbers of adults. In a study on our campus, Smith (1963) found 63 percent of 247 Robins captured in a cherry orchard early in the summer were young individuals. Over 90 percent of a like number of Robins, captured in a nearby highbush blueberry planting later in the summer, were young. Adults were observed feeding on domestic cherries, and some were known to carry cherries as far as one-half mile to their nestlings. The ground beneath such nests was often littered with cherry pits. Robins may carry other fruits to their

nestlings, but most other fruits do not ripen until after the nesting season. Furthermore, we twice observed fledglings near their nests being fed by adults other than their marked parent. It is apparent, therefore, that some young may become oriented to sources of food, such as fruit, by following their parent or other adults. One marked fledgling, for example, was observed leaving its nest-area with its parents. They flew toward a cherry orchard one quarter of a mile from the nest, and the marked nestling was seen there two days later. A nestmate of this individual also appeared at the cherry orchard, but was not seen with adults after leaving the nesting area.

In the vicinity of the University of Massachusetts there were two general areas where Robins concentrated in the summer. One area (sites B, C, and D in Fig. 1) was associated with the University orchards where there were cultivated cherries and blueberries, and wild black raspberries (*Rubus occidentalis*). The other area (site A in Fig. 1) was located at a state tree nursery and a University farming area. It provided cultivated blueberries, wild tatarian honeysuckle (*Lonicera tatarica*), and black cherries (*Prunus serotina*). There was a steady fruit supply at this area for a full six weeks each summer. The large number of tagged fledglings utilizing the source of food at site A was not surprising in view of the fact that 33 percent of the 52 nests which produced flying young were located just 0.2 miles away at the state tree nursery. The stability of this feeding flock was reflected by the almost equal numbers of tagged fledglings at the 0.2 mile range in the period from three to eight weeks after fledging (Fig. 2A). The proximity of this excellent nesting area to these fruit crops apparently diminished the rate of dispersal and gave rise to the bimodal distribution of ranges for young at eight-weeks post-fledging (Fig. 2B).

These two general feeding areas were about 0.7 miles apart. Over a three year period only four tagged fledglings, of 56 which fed at these sites, were known to have utilized both feeding areas. There was a marked tendency for immatures from nests within approximately one-half mile of site A to gravitate toward this source of food. Movement of fledglings from nests surrounding sites B, C, and D toward these sources of fruit was not at all pronounced. This was probably because there was not as large a quantity or as continuous a supply of food as there was at site A.

Each of the feeding areas where flocks occurred had an area adjacent to it which was suitable for loafing during the heat of the day. Loafing sites were in open stands of coniferous or deciduous trees with a closed canopy and very little undergrowth. Robins spending the day in these areas also fed upon invertebrates in the forest litter. Site tenacity of Robins to these loafing areas was quite weak compared to the persistence with which they continued to use sources of cultivated and wild fruit.

The pattern set by adult birds is probably very important in the establishment of feeding and social associations of the immatures. In 1963 Hester (this study) observed small flocks of apparently non-breeding adults of both sexes which became "gathering points"

for post-breeding adults and immatures. Such flocks were not observed in other years of this study. As members of feeding flocks, tagged immatures under observation maintained the same range as did adults. These flocks remained intact as long as the source of fruit was available, and there was little interchange of individuals between feeding flocks. After the fruit crop was gone at a given location, some tagged young remained in the same area, others disappeared entirely, and a few were seen a mile or more from the initial feeding site. Seven nestlings, out of 106 known to have reached the flying stage in this study, were observed more than a mile from the nest in the course of the summer. One of these traveled 5.6 miles, but the others moved less than 2.5 miles. Additional tagged young undoubtedly moved farther than one mile, but we were unable to follow such scattered movements.

Limited observations of roosting habits of recently fledged young indicated that these birds became regular members of roosting flocks as soon as they joined feeding flocks. The first tagged immatures were seen entering a roost in 1965 on June 11, the same day that young were first noted with a feeding flock. This particular roost was only 100 yards from the feeding area at A (Fig. 1) used by most of this roosting flock. It seems likely that it took longer for fledglings to arrive at roosts more distant from feeding areas. From June 11 on, roosting flocks grew steadily in size as increasing numbers of immatures joined them and increasing numbers of adults completed their nesting cycle. As with feeding flocks, we observed very little interchange among members of roosting groups. Only two out of 22 tagged young identified at roosts were seen at more than one roost. On a broader scale, only six percent of 93 tagged immatures and adults seen at roosts had appeared at more than one roost. It appeared to us that small roosts tended to be abandoned late in the summer, while large roosts persisted as late as the end of October. Undoubtedly, roosting and other flock activities are progressively influenced by migrants after September 1.

Because summer feeding flocks dispersed to a large extent during the month of August, little information concerning the fall migration was obtained from tagged Robins. Nine tagged immatures were identified in Amherst during October, the last one being seen on the 29th. The average distance of these birds from the nest was 0.8 miles—two were still within 0.1 mile and one had moved 2.3 miles. The last migrants left Amherst during the last three days of October in 1965. Five adults and four immatures were last seen in November (1963). Seven tagged Robins (5 adults and 2 of unknown age) wintered in Amherst during this study.

#### SUMMARY AND CONCLUSIONS

One hundred and eighty-three nestling Robins were wing-tagged for individual field identification during the summers of 1963, 1964, and 1965. One hundred and six, or 58 percent, of these birds were observed after fledging; of the remaining 42 percent most were not observed again. These birds typically remained in the vicinity of

their parents' territory for about three weeks. Fledglings made their way from the nest area to nearby sources of abundant fruit where many joined feeding flocks of adults and other immatures. Fledglings sometimes followed parents or other adults to feeding areas. In this study young usually traveled less than one half mile to an initial feeding location. A loafing site was associated with each feeding area. Members of feeding flocks ranged about one quarter mile from a central source of food. Flocks remained intact until the fruit supply was exhausted. Immatures joined roosting groups at the same time as they joined feeding flocks. There was little interchange among members of feeding flocks or members of roosting flocks.

Interspersion of cover within the cruising radius of young Robins was probably an important factor influencing their dispersal. It seemed to us that the interspersion within one half mile of the nest was favorable and may have limited the rate of geographical spread of young from their nest. We do not know whether this limitation on their pre-migratory experience influenced the distribution of nest sites chosen by the yearlings in the following spring. The movements of young Robins which we observed, however, seem to conform with Hickey's (*op. cit.*) observations of the distances at which yearling Robins nested from the sites at which they had fledged in the previous year.

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Received June, 1968.