ILLINOIS BIRDS: Mimidae

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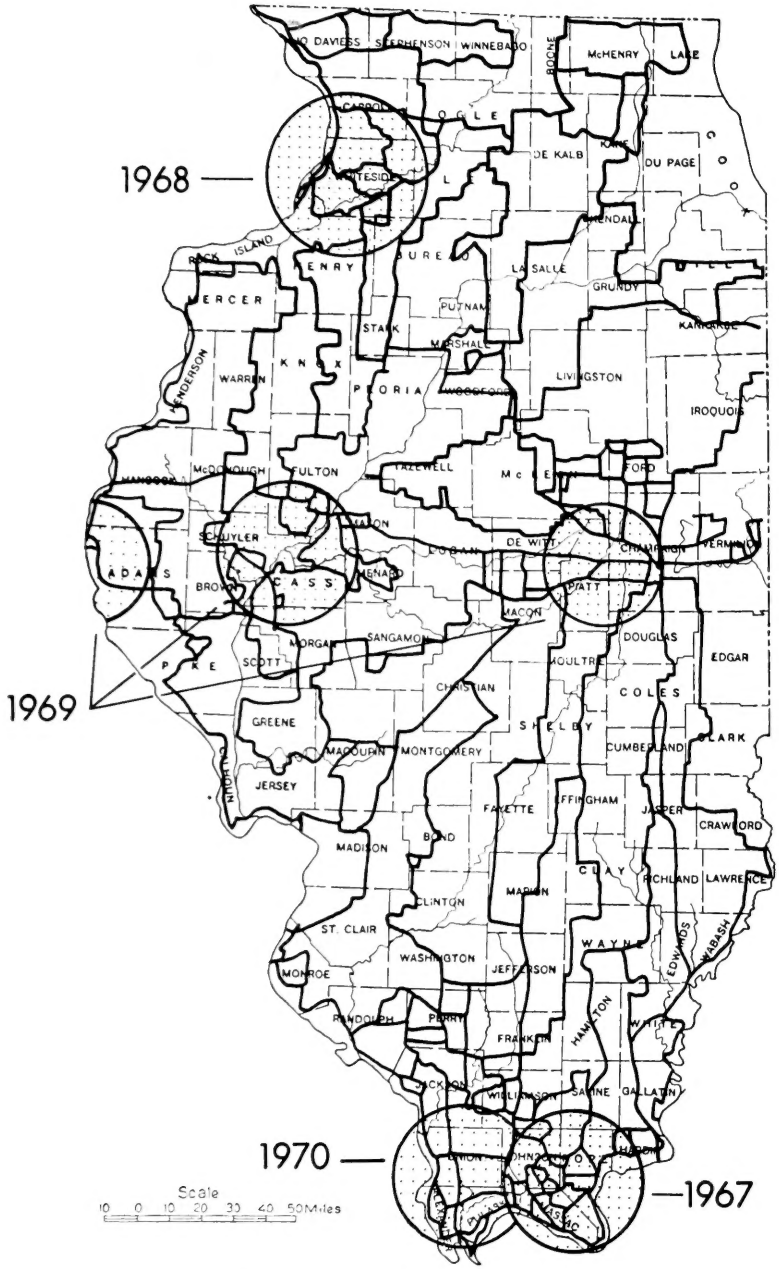

Fig. 1. — Routes travelled in summer, 1957–1969 to study breeding distribution of the birds of Illinois. The encircled areas were special study areas where daily censuses of migrants and nesting populations of birds were carried out, 1967–1970.

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Richard R. Graber, Jean W. Graber, and Ethelyn L. Kirk

IT MAY SEEM SURPRISING to many people that Illinois is still very poorly explored ornithologically, especially in any quantitative sense. In terms of real understanding of what bird populations are, or of what they do, the study of Illinois birds is little advanced from what it was a century ago.

The accelerating changes in the land, which began even before young Robert Ridgway started his studies of Illinois birds in the 1860's, have brought us to a potentially precarious ecological state. As a species, man is crowding other living things out of existence without knowing whether or to what extent he is dependent upon them. Now, increasingly, we need knowledge that there is little time to acquire. We need more than just a list of the state's various natural resources. We need the answers to a great many questions — questions on the distribution of populations, their reproductive potential and food habits, their energy and habitat requirements, their migration routes, and ultimately their ecological relationship to every other part of the environment. The answers will come, if at all, only through the efforts of a large number of dedicated students, bird students of all ages, throughout the state.

The series of papers on Illinois birds, of which this is the first, hopefully will provide a foundation for the work of those students. The papers will attempt to summarize what has been recorded about Illinois birds. The series, when complete, will include information on all of the species known to occur in Illinois, past and present. The papers are based primarily on (1) a compilation of data from published literature, (2) the authors' field notes and those of Benjamin T. Gault, and (3) specimens in the scientific collections of the Natural History Survey and the Chicago Museum of Natural History.

Unless otherwise stated, our discussions of the various species of birds refer only to the species in Illinois. To keep the work within some reasonable bounds, we have essentially ignored literature and data other than that for Illinois. Even a complete summary of the Illinois literature is not entirely practicable. On just the family Mimidae, for example, we have about 1,500 references. To summarize information from so many sources we adopted a policy of emphasizing those data which could be readily quantified, and have put as much of the information as we could into figures and graphs. The graphs on the annual cycle are based on the literature for the extremes of migration and nesting dates, and on our own field work, especially daily counts made mainly by R. R. Graber in six special study areas (Fig. 1) during 1967, 1968, 1969, and 1970. In each area counts were made along a carefully selected route varying in length from 80 to 105 miles in different regions. The routes were chosen to provide the maximum counts for the greatest number of species. Depending primarily on the numbers of birds seen, a route usually required 8–12 hours to cover. Each day, 4–6 hours were spent on woody habitats, 1–2 hours on open fields, 1 on aquatic habitats, and the rest on roadside habitats (driving). In making migration censuses, it was not our goal to obtain the maximum count possible for a particular species, but to get a representative count for each species in relation to all the rest. We were interested in daily and seasonal variation in the numbers of all species.

Obviously our 1-year studies in different regions of the state cannot truly represent either the whole state or any sizable part of it. These studies were intended only as comparative reference points for other workers. It is our hope that, over the years, other students will make quantitative studies in every county in the state. Particularly needed are data on the variations of populations from year to year in the same area, following the fine example of Dr. S. C. Kendeigh and his students in east-central Illinois.

The figures showing seasonal variation in egg laying are based on our repeated searches of the same areas throughout the breeding season.

We have prepared Illinois distribution maps for all of the native species, even those which we suspect nest in every township of Illinois. We adopted this policy especially to encourage students to fill in the gaps. It is a mistake to make assumptions about any phase of the biology of a population. Distribution patterns are not static, especially in this time of accelerating habitat destruction, and as yet we do not truly know the distribution of any species in Illinois. Hopefully, students throughout the state will be encouraged to undertake county-wide or township studies to work out both the geographic and ecological distribution of each species in great detail. Only from the vantage point which such detailed studies provide can we see how populations and distributions change. The maps are based on our own field work, and on the literature when the published record included precise details on date and locality. Our references to regions of the state — north, central and south — follow Smith & Parmalee (1955).

In drawing up the North American distribution maps, we have tried to be conservative, drawing limits at points where the species was of fairly regular occurrence. There are altogether too few recent faunistic papers from which to work out the broad distribution of each species, and for some regions our judgments as to the patterns of distribution were based on old literature. The maps are based

This paper, in the biological notes series, is published in part with private funds. Dr. Richard R. Graber is a Wildlife Specialist in the Section of Wildlife Research of the Illinois Natural History Survey. Dr. Jean W. Graber is a Research Assistant Professor of Animal Science at the University of Illinois. The late Miss Ethelyn Kirk served as Technical Assistant in the Section of Wildlife Research at the Survey.

on the American Ornithologists' Union Check-list of North American Birds (1957), and more than a hundred regional faunistic works.

Nomenclature for birds follows the A.O.U. Check-list unless otherwise stated. For plant names we have followed three references, Jones (1963), Fernald (1950), and Rehder (1947). For insect nomenclature, we have followed primarily Borror & DeLong (1964).

Except for the classic studies of Forbes (1879, 1880, and 1883), there would be almost no information on the foods of most Illinois birds. Though old, the studies are valuable especially for comparative purposes. For the many students who do not have access to the Forbes papers, we have summarized some of his data, usually in graphic form.

We have discussed subspecific populations and other specimen-related data only for those species for which we have sizable series of recent specimens, i.e., specimens collected within the past 5–10 years. Thus, in the Mimidae, we have presented no specimen data for either the brown thrasher or mockingbird, because the number of recent Illinois specimens in existence is too small. In the case of the catbird, the television tower kills have provided us with an excellent series of specimens in fresh fall plumage, and we have discussed variation in this species. The state research collection at the Natural History Survey in Urbana continues to grow, and in time we hope to present specimen data for most of the Illinois species. In our studies in various parts of the state, we have come to realize how extremely variable are the problems which bird populations face from place to place. Not only do these problems vary from northern to southern Illinois, but they may differ greatly even in adjacent counties. This heterogeneity of populations and their problems may be the most important single fact we can tell other students about the birds of Illinois, and we will never understand how populations survive without massive detailed information on this variability.

In this report it was not feasible to cite all, or even most, of the papers that presented data (e.g. arrival or departure dates) for a given species. By that procedure the text would have been an almost endless list of references, with the manuscript prohibitively long. Generally, we have not included data from newspapers.

For quick references on the Illinois avifauna the useful distributional checklist by Smith & Parmalee (1955), birds of the Chicago region by Ford (1956), Chicagoland birds by Smith & Beecher (1958), and the checklist for southern Illinois by George (1968) are available in many libraries.

Unless otherwise stated, the photographs were made in Illinois by the authors, and represent wild birds.

Many people helped us in one way or another with this project, and most of them will be referred to under the species accounts. Here we wish to acknowledge some who helped in special ways, as in the use of scientific collections and other research facilities. We are very grateful to Paul W. Parmalee, Milton D. Thompson, and John Paul of the Illinois State Museum, Emmet R. Blake and Melvin A. Traylor of the Chicago Museum of Natural History, Philip S. Humphrey and Alexander Wetmore of the U.S. National Museum, William George and John D. Parsons of Southern Illinois University, Donald F. Hoffmeister of the University of Illinois, and John Wanamaker of Principia College.

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A number of our colleagues at the Natural History Survey have helped with the project immensely. We would especially like to acknowledge Glen C. Sanderson and Thomas G. Scott for their support, encouragement, and advice on all phases of the study; Frank C. Bellrose, William C. Starrett, Charles F. Thoits III, Jack A. Ellis, Steven L. Wunderle, Philip W. Smith, and Marvin E. Braasch for valuable contributions of ideas and data; and Milton W. Sanderson and Robert A. Evers for identifying insect and plant species. James W. Seets prepared most of the scientific specimens. We are also much indebted to Ruth Warrick and Doris F. Dodds for their patient help with countless bibliographic and library problems, and to Carolyn S. Evers, Eleanore Wilson, Norma J. Hubbard, Dorothy M. Diehl, Linda J. Raisler, Hilda Wiesenmeyer, Renata Coates, Darlene Cacioppo, Judy Wildman, and Maxine Phillips, all of whom helped with many phases of the project including the acquisition of equipment, cataloging of scientific specimens, and typing of field notes and manuscripts.

O. F. Glissendorf provided valuable suggestions throughout the planning of the publications, and edited the final manuscript. Richard Sheets prepared the final line drawings, and Wilmer Zehr, the final photographic prints.

To Edythe J. Kirk of the University of Illinois Library we owe a special debt of gratitude for her kind encouragement and support in publishing the work.

MOCKINGBIRD *(Mimus polyglottos)*
(Fig. 5)

Spring Migration

The Illinois literature is almost devoid of direct references to migrations of the mockingbird. The only clue available as to the nature of the migration was provided by a specimen killed with a group of night migrants at a television tower in Champaign County May 7, 1956 (Brewer & Ellis 1958). As indirect evidence of the mockingbird's migration there are the many records of mockers appearing in northern Illinois in late April (especially after April 17) and May (Clark & Nice 1950, Coursen 1947, Ford 1956, and others).

The spring migration is somewhat obscured by the presence of mockingbirds in winter in many parts of the state, but even in southern Illinois our censuses showed the mockingbird population fluctuating seasonally in a pattern that suggested migration (Fig. 2). Both in southern and central Illinois the highest spring counts were in April. The distribution of sightings of mockingbirds reported in the literature for northern Illinois and our census data for the central and south indicate a timetable for the mocker similar to that of the brown thrasher.

Distribution

The general distribution of the mockingbird is shown in Fig. 3. In recent years mockers have been reported in winter throughout much of the breeding range, and with increasing frequency, even north of the main breeding range (Andrews 1967). There are recent nesting records in the northern tier of Illinois counties but there are still no published nesting records for most of the counties, even in southern Illinois (Fig. 4). At least as early as 1933 a mockingbird nest was reported north of the Illinois line in Wisconsin (Van Sickle 1942), yet even today the mockingbird population is sparse north of the central zone. Ridgway (1889) and Ferry (1907) pointed out that the distribution of the mocker was irregular. Population densities of mockingbirds are still highly variable from place to place. For example, mocker populations are notably higher in southeastern Illinois than in the southwest.

Even before the turn of the century, it was recognized that the mockingbird was extending its Illinois range northward (Forbes 1880). A number of observers have provided important reference points on the progression of the range extension (Fig. 4). Silloway (1902) found mockingbirds nesting only "sparingly" in northern Ma-

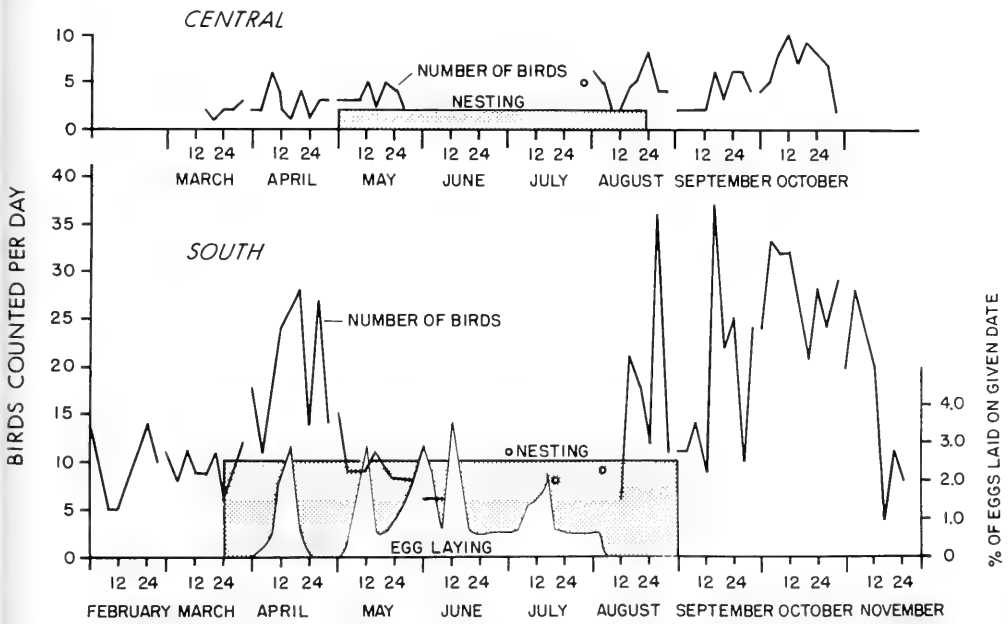


Fig. 2. — Nesting and migration seasons of the mockingbird in different regions of the state (see Fig. 1). Spring and fall graph lines show the highest daily counts of each 3 days (left hand scale). The lines are interrupted where data have not been collected. Shaded block indicates length of the nesting season and level of adult nesting population. Egg-laying graph line (right hand scale) is based on repeated searches of roadside habitat throughout the nesting season.

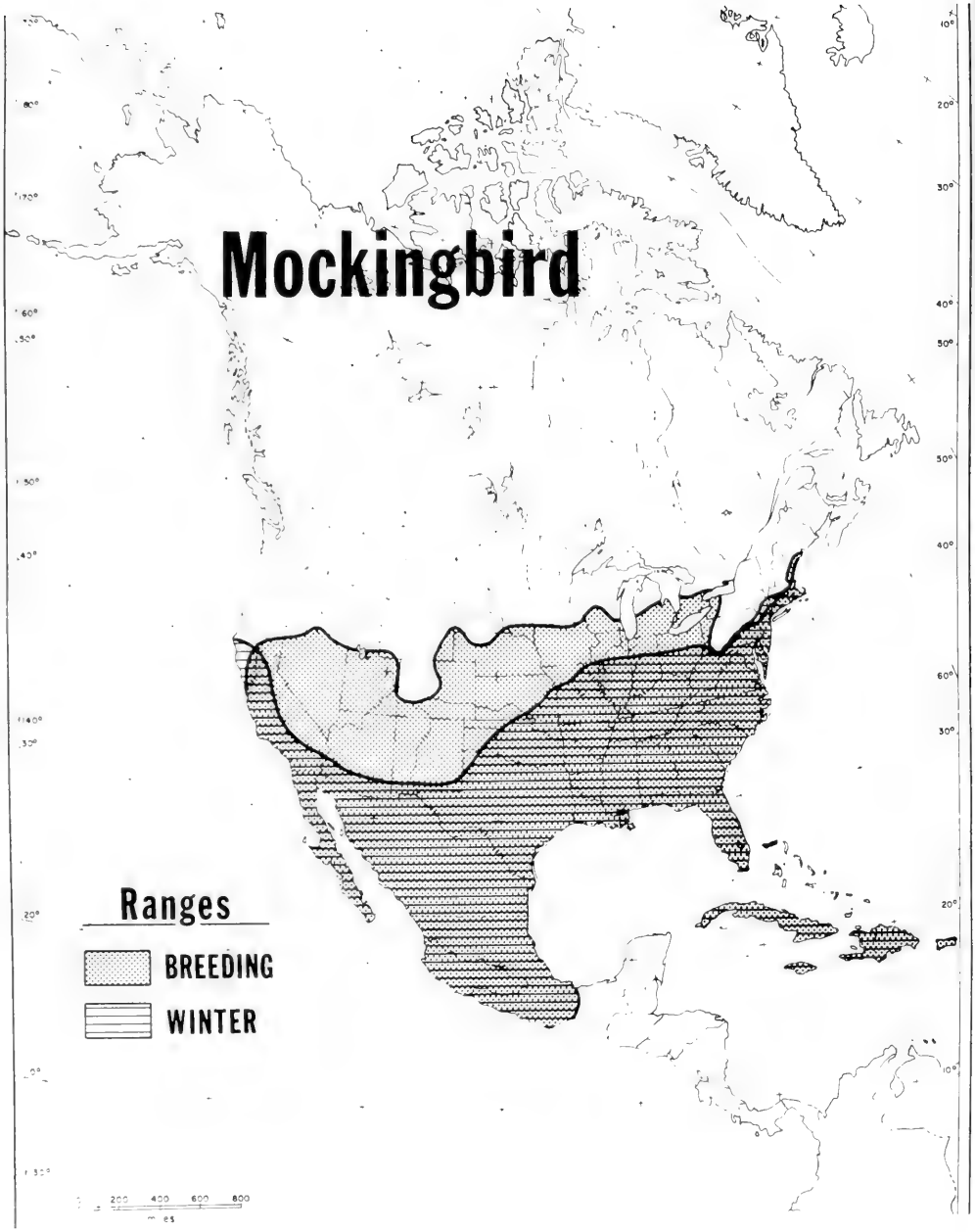


Fig. 3. — General distribution of the mockingbird. The outlined range may include large sections in which populations of the species are thin or even absent, because of the nature of the terrain and paucity of suitable habitat.

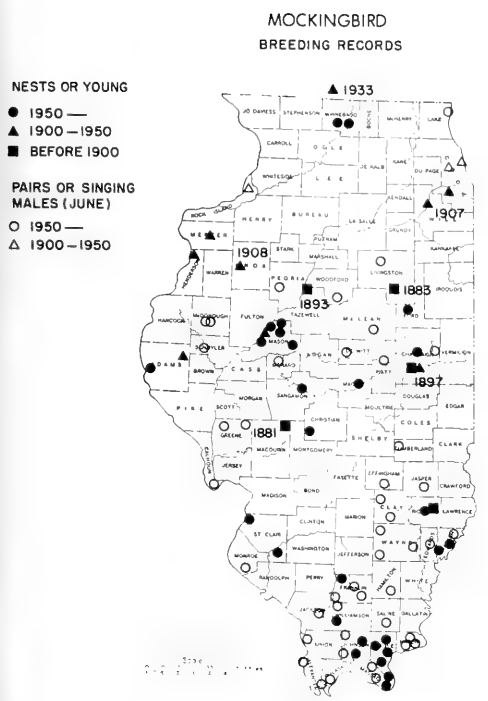


Fig. 4. — Breeding records for the mockingbird in Illinois. "Singing male" records are for June only. The dates represent early records of the species for the locality.

coupin County in 1881. In Adams County, Musselman (1938) noted that mockers were of irregular occurrence prior to 1933, but following a mild winter in 1936 the species was common in the 1937 nesting season. Bush (1934–1935) also noted an increase in the southern part of the state after 1933. In Champaign County, Smith (1923) found mockingbirds well established as permanent residents by 1923. Even earlier, Mundt (1883) found nests each year, and reported the mocker population increasing in Livingston County (Fig. 4). Prior to 1893 Murchison (1893) found the mockingbird common in Vermilion County but noted that the species was then becoming scarce.

Nesting Habitats and Populations

Like the thrasher, the mockingbird has much more tolerance of open field habitats than does the catbird. Vestal (1913) found more mockingbirds than thrashers in the sand prairie areas of Mason County, and Holland (personal communication) also suggested that mockingbirds have an affinity for sand areas in western Illinois. Yet, a fairly wide tolerance of soils is indicated by the species' presence on the black soils of the eastern part of the state and the red soils of southern Illinois.

Except for the statewide strip censuses (Graber & Graber 1963), there are almost no published measurements of mockingbird nesting populations in Illinois, and other types of censuses are needed.

The mockingbird faces much the same kinds of habitat problems as the thrasher. Forest, even forest edge and modified forest habitat, such as in old residential areas, is of even less value to the mocker than to the thrasher. Edge habitats in open country are the most favored by both species, and these are the habitats in greatest peril. In general, woody edge plantings in farmlands are rapidly being destroyed, and the mockingbird does not have a habitat reservoir in central and northern Illinois that is not declining in acreage. A possible exception is new residential habitat, but its value to a mocker is unknown. We have noticed that farmsteads are a favorite nesting habitat for the mocker in the south, but abandoned farms much less so, as if the presence of humans was important to the bird in this situation.

Our list of plants used by mockers for nesting (Table 1) represents principally southern Illinois and is surely incomplete even for that region. Our records represent mainly roadside nestings, and a more random study would be of great interest. Our data probably also minimize the importance of multiflora rose *(Rosa multiflora)*, because we had difficulty finding nests in this plant. In central Illinois Hess (unpublished notes) found osage orange *(Maclura pomifera)* to be the favorite nest plant, and in more recent years, multiflora rose has been used. There are no data on nest plants in the north.

We have no information on territory size of the mockingbird. The closest we have found contemporaneous active nests along roadsides was 275 feet, a much wider spacing than shown by catbirds in similar habitat.

Table 1. — Plants used by mockingbirds as nest sites in southern Illinois.

Species	Percent of Total (77 Nests)
Red cedar *(Juniperus virginiana)*	48
Osage orange *(Maclura pomifera)*	9
Japanese honeysuckle *(Lonicera japonica)*	8
Sassafras *(Sassafras albidum)*	7
Multiflora rose *(Rosa multiflora)*	5
Grape *(Vitis* sp.*)*	3
Catalpa *(Catalpa* sp.*)*	3
Greenbrier *(Smilax* sp.*)*	3
Trumpet-creeper *(Campsis radicans)*	3
Mulberry *(Morus* sp.*)*	3
Snowberry *(Symphoricarpos* sp.*)*	1
Plum *(Prunus* sp.*)*	1
Hackberry *(Celtis* sp.*)*	1
Virginia creeper *(Parthenocissus quinquefolia)*	1
Ash *(Fraxinus* sp.*)*	1
Red maple *(Acer rubrum)*	1
Elm *(Ulmus* sp.*)*	1
Linden *(Tilia americana)*	1

... carrying food to a nest of young. Right: same bird, approaching nest site in a small

Nesting Cycle

Ridgway (1918, 1923) reported that mockingbirds could be heard singing throughout the winter in Richland County, even when the temperature was near zero. In Pope County we have noticed relatively little singing in winter, but a definite increase in song just before mid-March, a more pronounced increase in mid-April, and in fall a resurgence of song in early October. Though the mocker's talents are well known, little has been recorded about the vocalizations in Illinois. At Aledo, Greer (1919) heard a mocker mimic 22 species of birds in an hour. The alarm note that we heard most often around nests was a sharp, staccato, crackling sound, similar in character to notes uttered in agitation by both catbirds and thrashers. Freeman (1950) has described the mockingbird's curious habit of periodically jumping 3 feet or so in the air from a perch, then landing at the same spot again. We have also seen mockers "wing-flashing," but have no data on the seasonal periodicity or function of either of these performances.

The nesting season of the mockingbird in southern Illinois lasts at least from March 24 (our earliest record of nest-building) to September 1 (our latest record of young fledged). Further study will probably show the season to be longer at both extremes, but most of the nesting surely falls in this period (Fig. 2). On our study area in 1967, most of the egg production occurred between April 8 and June 20 (Fig. 2), a much longer season than that of the thrasher in the same area. The egg-laying curve for the mockingbird has several peaks, and the species may be double brooded, but there was a high incidence of nest failures (see below), and banding studies are essential to learn the number of broods reared. The few nesting records available for central Illinois indicate the duration of the nesting season there to be from at least May 1 to August 23.

Data from a number of nests in southern Illinois show that one nesting cycle may take 33–36 days. Nest-building at one early nest required 7 days; laying, to the onset of incubation, took 3 days; and incubation time was 13

Fig. 6. Mockingbird nest (not in situ) with eggs, about life size. The eggs, usually 3 or 4, are often pale green or greenish and blotched with reddish brown. These two eggs were chosen to show pigment variation.

days. The development of young to fledging took another 13 days. Nest-building may generally take less time later in the season; we found several early nests that looked complete but remained empty 3–4 days before laying began.

In southern Illinois, plant species used for nesting were about the same as those used by thrashers (Table 1). The height of mockingbird nests varied with the season, the average being just under 5 feet in April and May (28 nests), and nearly 7 feet in June, July, and August (32 nests). We have no explanation for the change. No instances of ground nesting have been reported for this species.

Clutch size in 52 nests in southern Illinois averaged 3.8 eggs, with clutch distribution as follows: 6 eggs, 2 percent; 5 eggs, 6 percent; 4 eggs, 59 percent; and 3 eggs, 33 percent. There was little decline in clutch size from April to July, in marked contrast to the nests of both catbirds and thrashers. The majority of mockingbird nests in central Illinois also had 4-egg clutches. (For more information on eggs, see Fig. 6.)

Cowbird *(Molothrus ater)* parasitism of mockingbirds has not been recorded in Illinois.

Mockingbirds had the poorest nesting success of the three mimids. In April-May only 9 percent of the eggs laid survived to produce fledglings (Table 2). On the basis of largely circumstantial evidence, we suspect that much of this mortality came from black rat snakes *(Elaphe obsoleta)*. We saw this predator near nests often, but rarely saw the actual predation. Mockers often attacked the snakes, pecking them vigorously, but with little apparent effect. The mockingbird's nesting efforts were more successful later in the season (Table 2), and most of the production of young came in July and August. More years of study and larger samples of data are needed to see if this is a consistent pattern. Thrashers nesting in the same area as mockingbirds had better nesting success early in the season. Mockingbird nests were generally more conspicuous than those of the thrasher, and the mocker population may have served as a cushion for nesting thrashers by absorbing the brunt of the predation. The rate of infertility, i.e., no embryonic development, was only 2 percent in the mockingbird population we studied, but one form of mortality more apparent in the mocker than the other mimids was the death of half-grown nestlings from unknown causes, but possibly cold and exposure. Such deaths accounted for 6 percent of all eggs in April-May nests, but only 1 percent in later nests. Because there is so much similarity in habitat between nesting thrashers and mockingbirds, the question of possible competition deserves study. We witnessed one fierce fight between birds of these two species near a mockingbird nest in Pope County.

There are virtually no data on nesting success of mockers north of southern Illinois.

TABLE 2. — Nesting success of mockingbirds in southern Illinois.[a]

April-May				June-August			
Number		Percent Fledged		Number		Percent Fledged	
Nests	Eggs	Nests	Eggs	Nests	Eggs	Nests	Eggs
28	100	9	9	33	108	28	26

[a] Nesting success computed by exposure-day method (Mayfield 1961).

Fall Migration

Summer and winter distribution records for the mockingbird show that a definite population shift occurs between the two seasons (Fig. 2), but the precise timing and nature of that migration are unknown. The appearance of mockers in northern Illinois from September to November (Clark & Nice 1950, Ford et al. 1934, and others) may represent fall migration, but from where? There are many records of mockingbirds "out of place" in the north in November (Lewis 1925, Perkins 1927, and others). These records suggest that there may be much random wandering by mockers in the fall, and that the migration patterns are not yet fully developed.

Our censuses of mockingbirds in central and southern Illinois showed that fall populations were two times higher than spring populations and three to five times higher than summer populations, day to day. The level in October was particularly high (Fig. 2). Do the high populations from August to November represent productivity, migration, or both? So far as we know, no mockingbird has been found among the thousands of night migrants killed in fall at television towers in Illinois, but the towers in southern Illinois where we would most expect kills are rarely checked. To resolve the problems of the mockingbird's migration, its timing and manner, intensive banding studies are needed.

Winter Populations

The distribution of winter records of mockingbirds in Illinois is shown in Fig. 7. The most extensive winter population data for the mockingbird and other species come from the annual Audubon Christmas counts. The counts indicate great variation in the population from year to year (Fig. 8), but the long-term trend has been upward in more recent years in all three regions of the state. In northern Illinois the frequency of occurrence of mockers on Christmas counts averaged less than 1 percent between 1900 and 1948, but 5 percent in the next 20 years. The censuses for southern and central Illinois show a marked increase in the number of mockingbirds, beginning especially in the 1950's (Fig. 8). To some extent this increase may represent increased participation in the censuses, but many observers in many different areas reported the same kind of change in the Midwest and North (see especially Andrews 1967), and we believe the increase is real. The statewide censuses show the same trend (Graber & Graber 1963). The Christmas counts also emphasize the variation in mockingbird populations from place to place. In southern Illinois, Richland

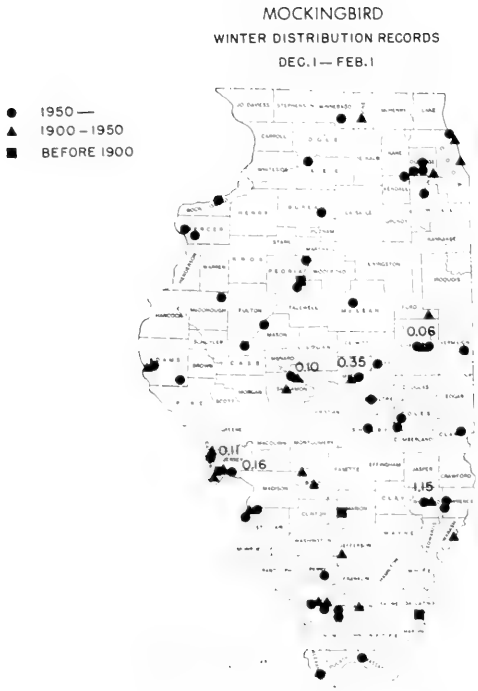


Fig. 7. — Winter records for the mockingbird in Illinois. The figures represent the long-term average of the number of mockers seen per party hour on the Audubon Christmas counts at localities with a long history of counts.

County, which had a notably high population in Ridgway's (1889) time, has a consistently high winter count to this day, and in central Illinois the counts in the Decatur area are consistently higher than the Springfield and Urbana counts (Fig. 7). The Christmas count data give us a relative impression of the populations. The only measurements of the winter population in more absolute terms are those of Shaw and Stine (1955), Shaw (1961), and Axelson, et al. (1965), and the statewide strip censuses.

The habitats used by mockingbirds seem much the same in summer and winter with high densities in edge shrub habitat both seasons. There is little utilization of forest edge in winter, and virtually none in summer, but pastures and fallow fields are important to the bird in both seasons. The importance of residential habitat to the mockingbird in winter is unknown. Many writers have commented on the relationship of mockingbirds to multiflora rose in winter (Fig. 9), and the presence of these rose hedges may have a definite bearing on the recent extension of the winter range in the North (Emery & Woodruff 1968). Rose hips are thought to be an important winter food.

The only observation relating to homing phenomenon in the mocker is that of Dyke (1956) who recorded a mockingbird (recognizable because of its crippled foot) at Princeton for at least four consecutive winters. This also constitutes the only longevity record for the species in Illinois.

Mockingbirds have been attracted to feeders in all parts of the state. They are especially attracted to suet and peanut butter, but also to asparagus berries, apples, and the fruits of bittersweet (Schantz 1922, Campbell 1953, and Smith 1923). In southern Illinois Ridgway (1918) noted that mockers were fond of raisins.

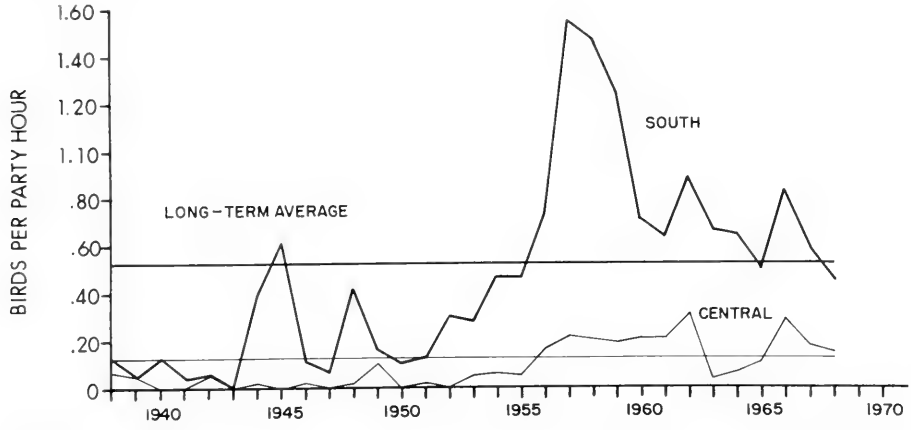


Fig. 8. — Annual variation in the number of mockingbirds seen per party hour on the Audubon Christmas counts in southern and central Illinois. The straight horizontal line represents the long-term average for the region.

Fig. 9. Mockingbird in winter plumage, resting in a multiflora rose hedge.

Food Habits

Forbes (1880) examined only two specimens of mockingbirds in his food habits studies and little has been done on the subject since. His specimens were taken near Bloomington, at least one of them in August. Sixty percent of the stomach contents consisted of Orthoptera. Other observers have recorded orthopterans, notably grasshoppers, in the mocker's diet (Vestal 1913, and Vandercook 1923). Much of the foraging is done on the ground, and Vandercook (1923) observed a mocker taking insects under garden mulch in February. Besides rose hips and the foods taken at feeders in winter (see above), mockingbirds take other kinds of fruit. In southern Illinois Steagall (1922) and Vandercook (1923) noted that persimmons (*Diospyros virginiana*) and hackberries (*Celtis* sp.) were important to the mocker. Also in southern Illinois, Ridgway (1929) found mockers feeding on the fruit of holly (*Ilex decidua*), and hawthorn (*Crataegus viridis*). In central Illinois Musselman (1939) saw mockingbirds feed on bittersweet (*Celastrus scandens*) berries during the cold weather, until waxwings decimated the supply. A mocker weathered the winter near Wilmette eating frozen apples still on a tree (Schaub 1942), and at Glen Ellyn a bird fed on the fruit of yew (*Taxus* sp., Stofer 1944). There are no real quantitative data on the food habits at any season, and none on the food of the young.

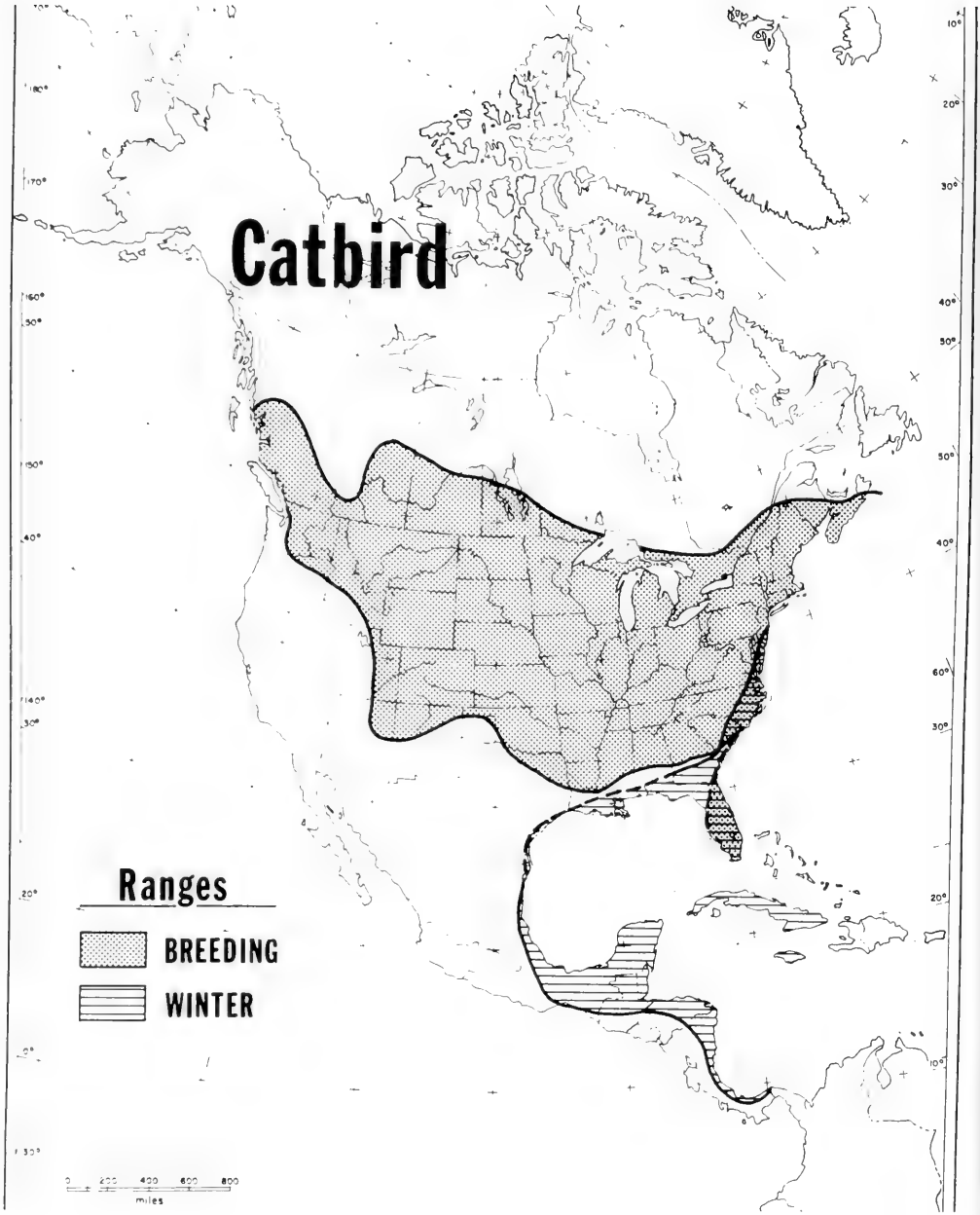
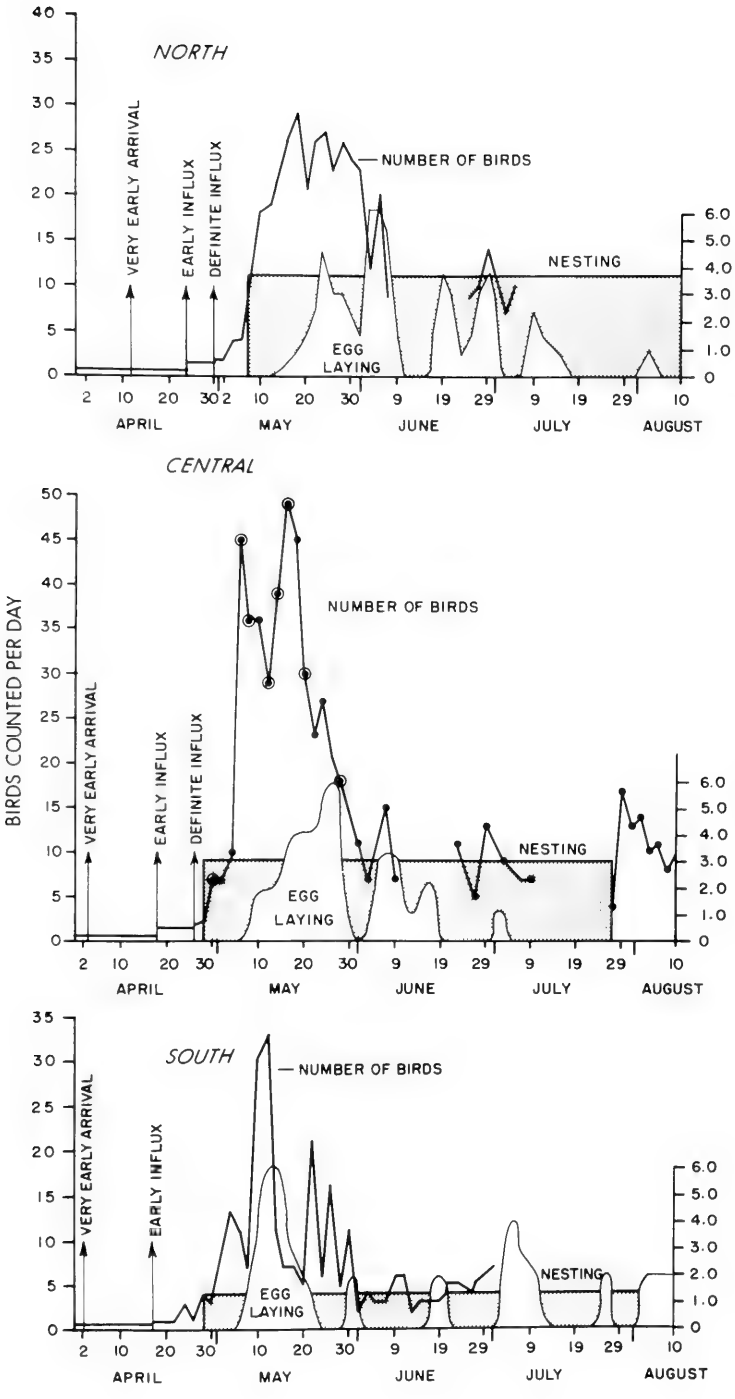
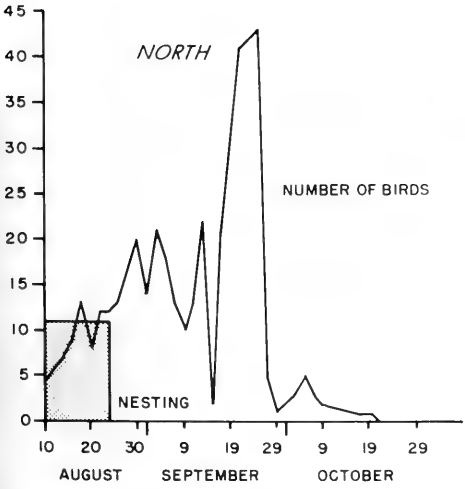
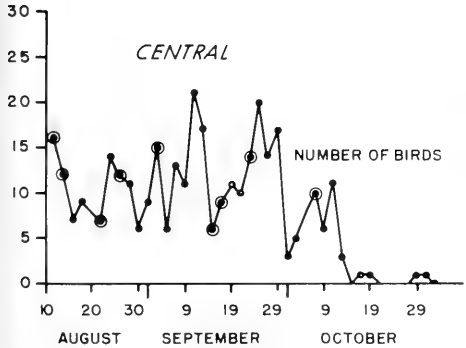


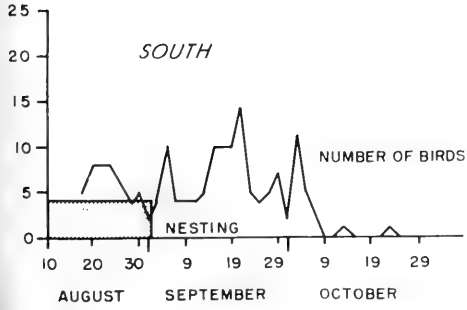
Fig. 10. — General distribution of the catbird. There are few breeding or winter records south and east of the dash lines in the U.S. The outlined range may include large areas in which populations of the species are thin or even absent because of the nature of the terrain and paucity of suitable habitat.

Fig. 11. Catbird in fresh fall plumage. The pokeberries were tied to the branch as bait for the bird.


NORTH
VERY EARLY ARRIVAL
EARLY INFLUX
DEFINITE INFLUX
NUMBER OF BIRDS
NESTING
EGG LAYING
CENTRAL
BIRDS COUNTED PER DAY
% OF EGGS LAID ON GIVEN DATE
SOUTH
APRIL
MAY
JUNE
JULY
AUGUST







CATBIRD *(Dumetella carolinensis)*

(Fig. 10 and 11)

Spring Migration

So far as we know, catbird migration in Illinois is strictly nocturnal, spring and fall, but the only direct indication of the night flight in spring is a catbird killed with other night migrants at a television tower in Champaign County on the night of May 28-29, 1963.

Though there are a few winter records of catbirds in Illinois, the onset of the spring migration is conspicuous, and, in marked contrast to the early migration of the thrasher, shows little disparity in timing between the southern and the northern regions of the state (Fig. 12).

There are a few March (26–29) records of catbirds in Illinois (Blocher 1921, Schwager 1961, and others), and a few for early April (Beecher 1937, Cooke 1888, and others), but the early arrival dates recorded by most observers fall between April 17 and May 1, with usually no more than a week between early arrivals in the south (April 17) and the north (April 24). Definite influxes are often noted, April 26–28, and May 1, and, quantitatively, May is the month of catbird migration throughout the state (Fig. 12).

As in the case of the thrasher, the catbird's spring migration is particularly conspicuous in west-central Illinois, and least notable in the south (Fig. 12), perhaps reflecting the large amount of concealing cover in the south.

Nothing has been recorded on specific habitat requirements or preferences if any, of migrating catbirds, nor are there published data on the destinations of transient catbirds which pass through Illinois in spring.

Distribution

The general distribution of the catbird is shown in Fig. 10. The species probably nests in every township in Illinois, but published records are lacking for many counties (Fig. 13).

Nesting Habitats and Populations

Like the thrasher and mockingbird, the catbird is an edge species, but unlike them it is not nearly so tolerant of open spaces. Where the thrasher follows linear hedge plantings far out into the open cultivated fields, the catbird stays closer to more wooded areas. Still, on the basis of population density, edge shrubbery is the favorite habitat in most of northern and central Illinois (Table 3). Compared with thrashers, catbirds are much more toler-

Fig. 12. — Nesting and migration seasons of the catbird in different regions of the state (see Fig. 1). Spring and fall graph lines show the highest daily counts of each 2 days (left hand scale). The lines are interrupted where data have not been collected. Encircled points represent censuses in the Illinois valley; other points represent east-central Illinois. Shaded block indicates length of the nesting season and level of adult nesting population. Egg-laying graph line (right hand scale) is based on repeated searches of roadside habitat throughout the nesting season.

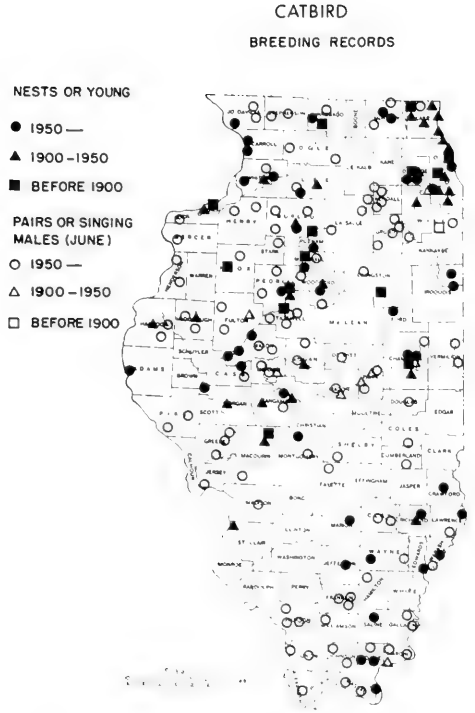


Fig. 13. — Breeding records for the catbird in Illinois.

ant of man, and there is an interesting variation from north to south in the use of urban residential habitat by catbirds (Table 3). In the north this habitat is relatively little used and in the south it is the most important habitat. The catbird, thus, has at least one expanding habitat.

The catbird is also a forest-edge species (Kendeigh 1944). In Piatt County, Weise (1951) found no catbirds nesting in floodplain or upland forest, but two to three pairs per 100 acres in forest edge. In Mason County, Gates (1911) considered the catbird a dominant species of hydrophytic thickets, and of secondary importance in hedges, orchards, and bottomland woods. Nehrling (1880) also felt that the catbird favored wet areas, and Beecher (1937), Robertson (1944), and others have recorded the species nesting in notably wet habitats. In southern Illinois especially we have found catbird nesting population to be highest in swampy situations.

We have summarized the available data on plant species used for nesting by catbirds (Table 4). They use thorny plants for nest sites, but not to the extent that thrashers do. In northern and central Illinois, grape (*Vitis* sp.) is much used by catbirds, not only for nest placement, but in nest construction. Barnes (unpublished notes) noted that a very high percentage of catbird nests contained sizable amounts of grape bark.

The only information on the size of a catbird's territory in the state is from southern Illinois, where Brewer (1955) recorded the area of activity of two nesting pairs to range from 0.16 to 0.36 acre. This is much smaller than the territories of brown thrashers in central Illinois (1.6+ acres, Hensley 1948). Our data also indicate small territories for catbirds; we have found active nests (with eggs) only 48 feet apart in a southern Illinois thicket.

Nesting Cycle

Ridgway (1925), Schantz (1931), and others believed that catbirds returned to the same nesting territory year after year. Banding records presented by Bartel (1935), Lincoln (1927), and Jurica, et al. (1959) tend to support this view, as catbirds banded in May and June were recovered in successive years at the places of banding. Bartel (1942) also banded a young catbird and recovered it the next year in the same area.

Like the thrasher, the catbird arrives singing in spring. Of the song, Ridgway (1889:108) reported that the song is conspicuous, sometimes brilliant, but in his performance there is too much deliberation, and the general effect is that he is merely practicing. The catbird's whisper song is especially soft (Schafer 1916). Catbirds mimic some sounds (Ridgway 1889:108), and also, like the mocker, sing at night (Farwell 1919, Musselman 1932). Singing drops off sharply after June, and during July and August songs are often subdued and incomplete with few birds singing. The cat call that gives the bird its name is heard increasingly later in the nesting season, along with an alarm note which we translate as a "chwurk."

The nesting season, from the beginning of nest-building to the fledging of the last young lasts from about April 28 to September 2 in southern Illinois, and from May 7 to August 24 in the north (Fig. 12).

One nesting cycle, from nest-building through fledging of young, took 29 days at Wilmette, Illinois (Davis 1942), but most nestings probably take slightly longer. We have known nests to remain empty 5 and 6 days before receiving the first egg, and have recorded incubation periods of 12–13 days for several clutches. Young usually fledged in 11–12 days. Davis (1942) felt that incubation was carried out exclusively by the female, setting about 20 minutes and taking off 5. He also reported that both sexes fed the young.

Data on the plants used for nest sites are summarized in Table 4. Most catbird nests are found at heights between 4 and 8 feet. Our sample of 85 nests from northern Illinois averaged 5.5 feet in height. Nests further south were higher, on the average — 6 feet in central Illinois (26 nests), and nearly 8 feet in the south (21 nests). We have no explanation for this trend. By comparison with the thrasher, catbirds place their nests high. A catbird nest located about 50 feet high in an elm in Peoria County (Loucks, unpublished note) was probably exceptional. We have found no record of a ground nest for this species.

TABLE 3. — Breeding populations of catbirds in various Illinois habitats.

Habitat	Acres	Birds Per 100 Acres[a]	Years	Type of Census	Region or County	Reference
Edge shrubbery	15	150	1957–1958	Strip	North	Graber & Graber 1963
	21	52			Central	
	22	5			South	
Thickets	7	226	1937	Nest	Lake (N)	Beecher 1942
	13	46	1950	Nest	Jackson (S)	Brewer & Hardy 1950
Early shrub	..	72	1966	Nest	Vermilion (C)	Karr 1968
Late shrub	..	32	1966			
Block shrub areas	32	31	1957–1958	Strip	North	Graber & Graber 1963
	49	14			Central	
	107	1			South	
Orchard	36	5	1957–1958	Strip	North	Graber & Graber 1963
	78	3			South	
Second growth or cut-over woods	15	86	1937	Nest	Rock Island (N)	Fawks 1937
	15	106	1938			Fawks 1938
	56	7–25	1941–1944	Nest	Sangamon (C)	Robertson 1941, 1942, 1944
	46	22	1948			Robertson & Snyder 1948
Virgin floodplain forest	77	3	1948	Nest	Sangamon (C)	Snyder, et al. 1948
Grazed bottomland	93	6	1955	Nest	Macon (C)	Chaniot & Kirby 1955
Forest (all types including edge)	177	2	1957–1958	Strip	North	Graber & Graber 1963
	214	7			Central	
	340	+[b]			South	
Forest edge	55	0–7	1927–1948	Nest	Champaign (C)	Kendeigh 1944, 1948
	55	(0–12 per mile)	1949–1968	Nest	Champaign (C)	Kendeigh & Fawver 1949, Kendeigh & Forsyth 1959, Kendeigh & Barnett 1968
Modified woodland	28	43	1937	Nest	Lake (N)	Beecher 1942
Parkland estates	100	16	1915	Nest	Cook (N)	Eifrig 1915
Residential areas	160	1	1958	Strip	North	Graber & Graber 1963
	75	4			Central	
	98	22			South	
	8	75	1915	Nest	Richland (S)	Cooke 1916
Swampy prairie	67	3–6	1941–1944	Nest	Sangamon (C)	Robertson 1941, 1942, 1944

[a] We have converted all figures to read birds per 100 acres or birds per mile of edge (number of territorial males or nests × 2).
[b] Less than one.

For our sample of nests in northern and central Illinois, clutches averaged 3.7 eggs in May and June, and 3.1 in July and August (Table 5). Cowbird parasitism of catbirds is apparently rare. The one Illinois record we know of was in a nest observed by Goelitz (1915).

Nehrling (1880) and Schantz (1931) believed that catbirds regularly produced two broods a year, but there are no observations on banded birds either to substantiate or refute their view. The laying curve for catbirds in Illinois (Fig. 12) has several peaks, much like that of the mockingbird, but very different from the high-peaked graph for the thrasher. Most of the egg production comes in May and June (Fig. 12). (For an illustration of the nest and eggs, see Fig. 14.)

Nesting success of the catbird (Table 6) was quite consistently higher than that of the thrasher. In northwestern Illinois in late summer about two-thirds of the eggs laid produced fledglings (Table 6). The only other success data available for catbirds in Illinois are those of Finley (1917) who found that catbirds had the highest success (about 65 percent of eggs produced fledglings) of the common species on the Normal School campus at Macomb.

We can offer no reason for the catbird's high nesting success, compared with that of the other mimids, and there are few observations on the causes of nest failure in this species. Only about 2 percent of eggs in northern Illinois failed to develop embryos. Thompson (1958) and Baroody (1938) reported attacks by blue jays *(Cyanocitta cristata)* on catbird nests in northern and southern Illinois, and Ridgway (1921) observed a gray squirrel *(Sciurus carolinensis)* destroying a catbird brood in the south.

Fall Migration

In August and early September many if not most catbirds are in molt and their appearance is ragged. We have seen a few still molting heavily as late as September 22 in central Illinois, but many catbirds appear to have completed molting by September 10 and we have seen catbirds in fresh plumage as early as August 17.

When the fall migration of catbirds actually begins is unknown. Recorded departure dates from Illinois range

TABLE 4. — Plants used by catbirds as nest sites.

Species	Percent of Total Nests		
	North (121 Nests)	Central (31 Nests)	South (27 Nests)
Grape (*Vitis* sp.)	21	23	
Dogwood (*Cornus racemosa*), *C. rugosa* and *C.* sp.	17	3	4 (*florida*)
Sassafras (*Sassafras albidum*)			26
Hawthorn (*Crataegus* sp.)	7	6	11
Virginia creeper (*Parthenocissus quinquefolia*)	3		18
Elm (*Ulmus* sp.)	3	10	4 (*alata*)
Gooseberry (*Ribes* sp.)	12	6	
Crabapple and apple (*Malus* sp.)	1	10	4
Multiflora rose (*Rosa multiflora*) + *Rosa* sp.	6	3	4
Osage orange (*Maclura pomifera*)	1	13	
Willow (*Salix* sp.)	2	10	
Red cedar (*Juniperus virginiana*)	2		7
Black locust (*Robinia pseudoacacia*)	1	3	4
Plum (*Prunus* sp.)			7
Box-elder (*Acer negundo*)	2	3	
Oak (*Quercus* sp.)	1		4
Sumac (*Rhus* sp.)	1		4
Bramble (*Rubus* sp.)	5		
Ash (*Fraxinus* sp.)	1	3	
Honeysuckle (*Lonicera* sp.)	4		
Mulberry (*Morus* sp.)	4		
River birch (*Betula nigra*)		3	
Lilac (*Syringa* sp.)		3	
Golden-bell (*Forsythia* sp.)		3	
Elderberry (*Sambucus canadensis*)	2		
Norway spruce (*Picea abies*)	1		
Hazel (*Corylus americana*)	1		
Spirea (*Spiraea* sp.)	1		
Yew (*Taxus* sp.)	1		

from mid-September to mid-October, with most falling in late September and early October. The catbird migration is almost over by October 10, but there are a few records for November and even fewer on into the winter (Fig. 12).

Our censuses indicate a definite increase in catbirds in August over the summer population (Fig. 12), and we judge that the southward movement begins by at least mid-August in northern and central Illinois. Our data show many more migrating catbirds in northern Illinois than in the south, with central Illinois intermediate in volume.

Only in northern Illinois did the total fall count exceed the spring count of catbirds. The low fall counts are enigmatic, for we would expect a population increase during the summer, and, hence, a high fall count. There are several possible explanations of the paradox. Among other things, the census method may be faulty, or the behavior of the birds so different in fall that they go undetected. The gradation in the fall population from high in the north to low in the south suggests the possibility that many of the northern catbirds are migrating eastward as well as southward (see below under Specimen Data).

TABLE 5. — Clutch sizes of catbirds in northern and central Illinois.

Months, Years	Total Number of Nests	Average Clutch	Percent of Nests with Clutches of:			
			5 Eggs	4 Eggs	3 Eggs	2 Eggs
May-June, 1967-1968	38	3.7	5	58	37	..
July-Aug., 1967-1968	9	3.1	..	22	67	11

The only fall recovery of an Illinois-banded catbird that we know of was reported by Laskey (1961). The bird, banded at Lisle, Illinois, May 19, 1960, by Dr. Edmund Jurica, was killed September 28, 1960, at a television tower at Nashville, Tennessee, southeast of the place of banding.

Catbirds are common victims at television towers and other high structures during night migration. Even long ago Gastman (1886) recorded catbirds among the casualties at an electric light tower in late September at Decatur. Catbirds comprised 3 percent of about 6,500 bird specimens picked up at television towers in central Illinois between 1955 and 1967. This is about 30 times the kill of thrashers in the same period, notwithstanding the fact that more thrashers than catbirds were seen during the fall censuses when the kills occurred. The highest kills of catbirds occurred September 20–30 (Fig. 15). This was also the period of high peaks in our fall counts (Fig. 12).

There are no data on location of the wintering grounds of Illinois catbirds.

Winter Records

The distribution of winter records of catbirds in Illinois is shown in Fig. 16. There were very few winter records prior to 1950, but more have been found in recent years as participation in the Christmas counts has increased. The frequency of occurrence during the past 25 years (1944–1968) has been only 1 percent in the north (192 censuses) and south (124 censuses) zones of the state and 3 percent in central Illinois (140 censuses).

How often catbirds actually remain through the winter in Illinois is unknown. Nor is it known how well they survive.

Food Habits

There is little information on the foods of catbirds in Illinois other than the studies of Forbes (1880) based on specimens collected in northern and central Illinois (Fig. 17). Forbes found that in May catbirds fed almost entirely on animal matter. Ants, caterpillars (Lepidoptera), crane flies (Tipulidae), ground beetles (Carabidae), and spiders were quite regularly important constituents of the diet, but beginning in June, fruits were increasingly important on into the summer (Fig. 17).

Fig. 14. — Catbird nest (not in situ) with eggs, slightly smaller than life size. The eggs, usually 3 or 4, are solid colored, rich blue-green.

Among the wild fruits, elderberries *(Sambucus canadensis)* were particularly favored in September but we have seen catbirds feeding heavily on black cherries *(Prunus serotina)* also, and, in baiting birds to photograph (Fig. 11), we found that catbirds showed a preference for pokeweed fruit *(Phytolacca americana)* even over elderberries. Cultivated fruits were also much used, especially raspberries, blackberries, and cherries. Kinney (1868) called the catbird "the most worthless bird . . . ; eats most kinds of fruit and mutilates more than it eats, especially grapes."

Recently in northeastern Illinois Young (1968) observed catbirds preying on newly emerged adult dragonflies (Odonata). These insects seemed to be an important

TABLE 6. — Fledging success of catbirds[a] (computed by exposure-day method, Mayfield 1961).

Region	Year	May-June				July-August			
		Number		Percent Fledged		Number		Percent Fledged	
		Nests	Eggs	Nests	Eggs	Nests	Eggs	Nests	Eggs
Northwest	1968	33	114	40	36	15	40	69	69
Central	1969	10	35	49	49	[b]	[b]	[b]	[b]
Southeast	1967	[b]	[b]	[b]	[b]	21	58	34	34

[a] Based on all active nests including those that failed during nest building and laying.
[b] No data.

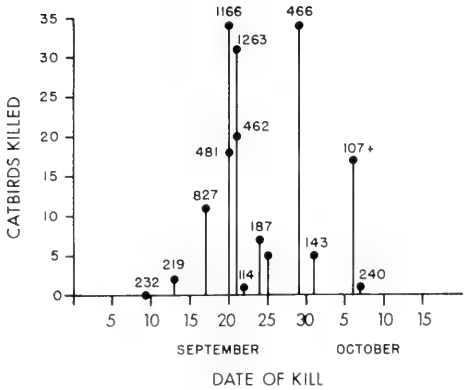


Fig. 15. — Numbers of catbirds killed at central Illinois television towers during night migration. The numbers on the graph lines indicate the total numbers of specimens picked up of all species.

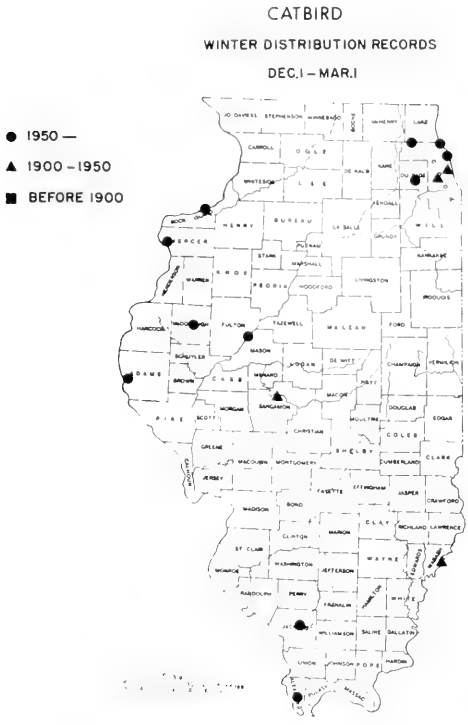


Fig. 16. — Winter records for the catbird in Illinois.

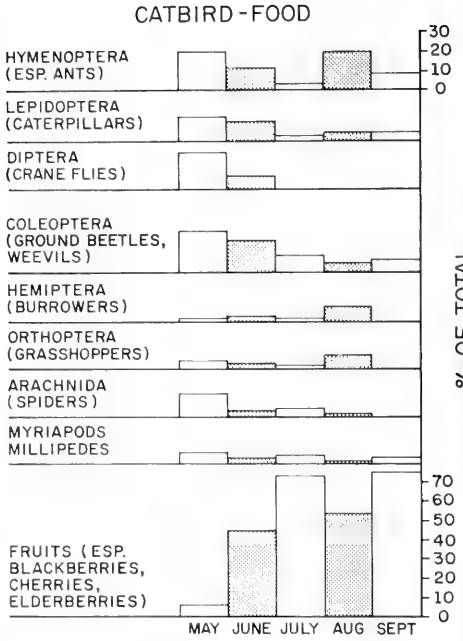


Fig. 17. — Food habits data on the catbird from the study of Forbes (1880). Percentages represent the part of the total food identified in the stomachs of a number of catbirds examined each month.

food for the birds, and at one pond the predation had a drastic effect on the dragonfly population. There are no other recent studies on the catbird's food. Our only information on the food of nestlings is from our observation that older nestlings were fed black cherries, especially in southern Illinois. There are no data on the relative availability of different foods.

Catbirds are readily attracted to feeders. Brintnall (1918) and Jackson (1905) reported catbirds eating suet, and even feeding it to fledglings. Jacques (1927) noted that catbirds were attracted to fruit, especially cut apple, and Schafer (1917) mentioned the catbird's fondness for walnut (*Juglans* sp.) kernels.

Longevity

The oldest Illinois catbird on record was a bird banded by Bartel (1967) at Blue Island. It was at least 6 years and 9 months of age. There have been no population studies on the average life expectancy of catbirds.

Bartel (1962) found that catbirds disappeared from a Blue Island area in 1959 following an application of heptachlor. He felt that the catbird population was also

depressed the next year, perhaps reflecting the reduced food supply following the insecticide application.

Specimen Data

In our series of 58 catbird specimens (Table 7) saved from television tower kills in central Illinois in September and October during the past 4 years, there are two distinct color types showing little or no gradation. Both types are represented in all age and sex classes. One type, presumably representing the nominate race, is darker with very dark bay crissum. The other form is decidedly pale, especially on the belly and crissum, the crissum being rufous brown.

In all respects the paler birds show the characters of the western race, *ruficrissa* (Aldrich 1946, Phillips, et al. 1964), and we are tentatively considering them as that form. There are several reasons for caution in accepting the identification. The greatest drawback is the paucity of recent comparative material in fresh fall plumage. Except for our own series, most of the catbird specimens we have seen are so old as to be almost worthless for color comparisons. We are also concerned by the high proportion (nearly 50 percent) of *ruficrissa* in our collection. Is there, in fact, such a notable migration of western birds through east-central Illinois? On the other hand Aldrich (1946) included the West Indies in the winter range of *ruficrissa*, in which case Illinois can very well be on the migration route. Also, Phillips, et al. (1964) noted that the *ruficrissa* population migrates eastward, and we now believe that many western catbirds do migrate through Illinois.

Students in other parts of the state can also shed more light on the problem by preserving large series of specimens from local tower kills. Comparative series from southern and northern Illinois should prove particularly interesting.

TABLE 7. — Weights and measurements of fall (September-October) catbird specimens killed in east-central Illinois.

Age and Sex	Number of Specimens	Gross Weight (grams)		Wing Length (mm)		Tail Length (mm)		Culmen from Nares (mm)	
		Range	Mean	Range	Mean	Range	Mean	Range	Mean
Adult male	11	33.4-42.5	39.0	87.8-94.5	91.7	89.6-98.0	93.9	12.2-13.7	13.0
Immature male	21	34.4-49.1	40.1	84.5-92.3	88.3	83.4-94.9	89.7	11.0-13.0	12.0
Adult female	9	34.7-41.0	37.7	85.5-91.0	88.5	87.0-95.6	91.2	12.1-13.5	12.8
Immature female	17	33.6-44.1	38.6	83.8-88.3	86.0	83.0-90.1	87.1	11.2-12.8	12.0

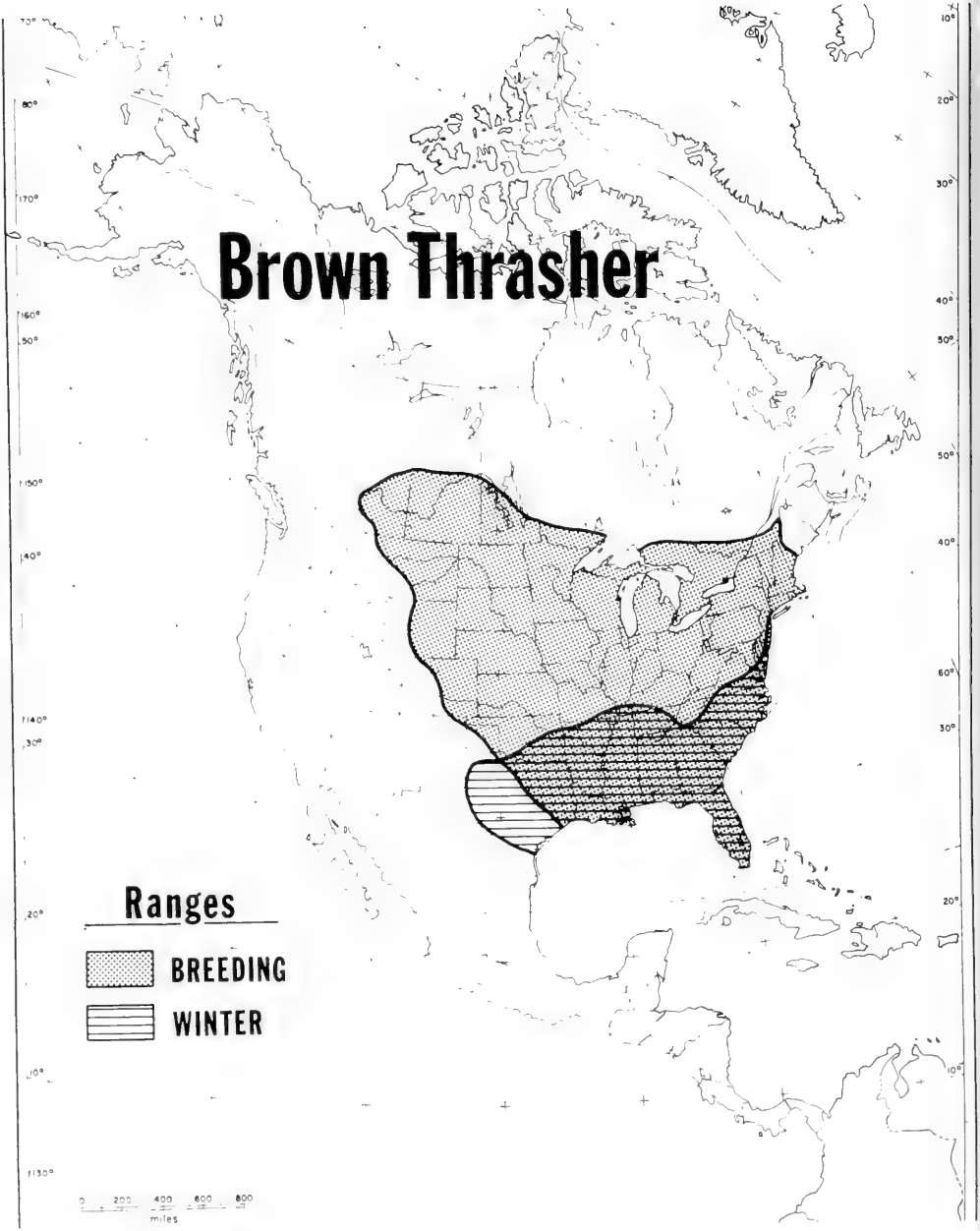
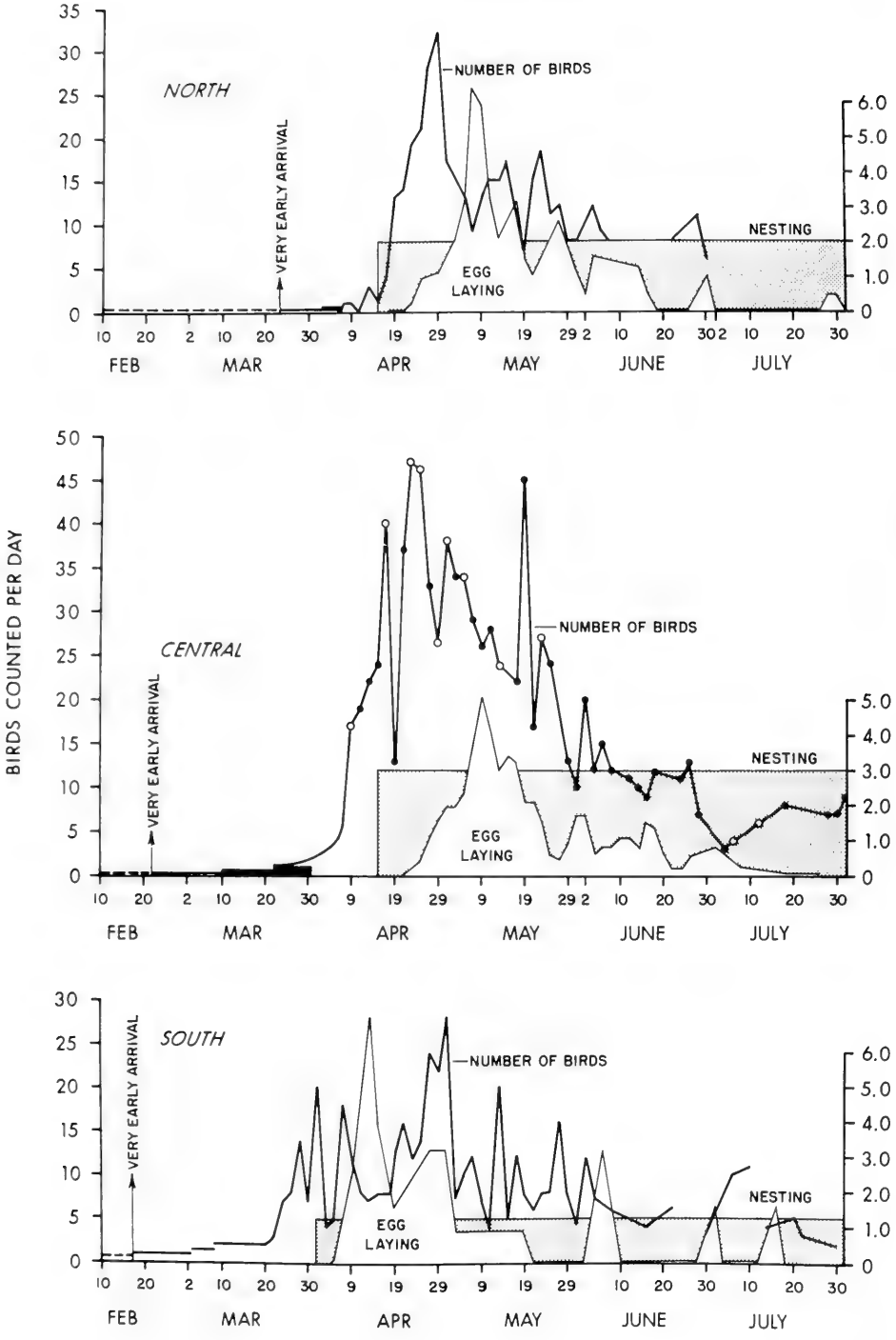


Fig. 18. General distribution of the brown thrasher. The outlined range may include large sections in which populations of the species are thin or even absent because of the nature of the terrain, and paucity of suitable habitat.

Fig. 19. Brown thrasher in slightly worn breeding plumage. The bird is near its nest.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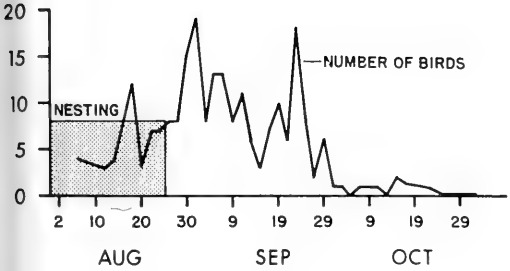

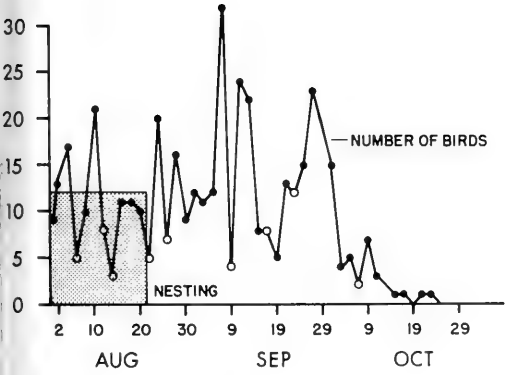

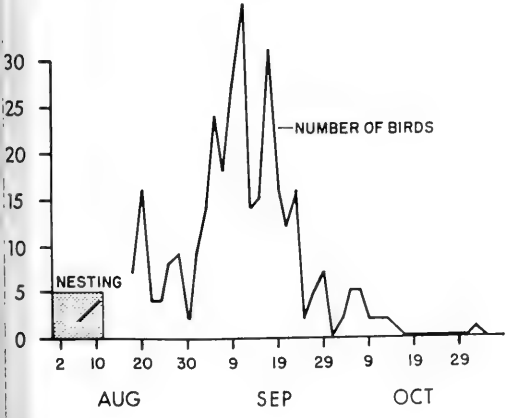

BROWN THRASHER *(Toxostoma rufum)*

(Fig. 18 and 19)

Spring Migration

The onset of the thrasher's spring migration is somewhat obscured because of the thin winter population, and the paucity of birds involved in the earliest flights (Fig. 20). This early influx, which reaches southern and central Illinois in late February or early March and northern Illinois in late March, may be a different phenomenon than the larger migrations that start 2 weeks to a month later. At least the later migrations are probably nocturnal. One specimen was recovered with other night migrants on the night of May 6–7 by Brewer & Ellis (1958).

The most frequently mentioned arrival dates for southern Illinois are March 21–27 (Ridgway 1889, Cooke 1888). Our census data indicated major movements of thrashers from March 26 through most of April and May with peak numbers in late April and early May (Fig. 20).

Thrasher arrivals in central Illinois have been noted especially from March 23 to April 1, and there were marked waves from April 1 to 13 (Hess 1910, Smith 1930, and others). The 1969 census data indicated relatively large migrations throughout April and May with peak numbers in late April. The highest counts were obtained in the western study area along the Illinois River valley.

March records of thrashers in northern Illinois are unusual, and the most frequent arrival dates mentioned are April 10–17 (Abbott, et al. 1933, Kerber 1923, Gault 1901, and others), with the peak numbers following quickly in late April (Fig. 20).

There was relatively little difference in the timing of the peaks of the thrasher migration in southern, central, and northern Illinois. A noteworthy difference, however, is that in southern Illinois thrashers of the local breeding population established nests before the peak in migration, while in central and northern Illinois most nests were established after the peak (Fig. 20). This lends credence to the idea that the peak counts actually represent the passing of transients, i.e., birds enroute to places farther north. We have only one banding recovery to indicate where transient thrashers are headed in the spring. A bird banded at Urbana, April 22, 1965, was recovered the following April due north in eastern Wisconsin (Fig. 26).

Distribution

The general distribution of the brown thrasher is shown in Fig. 18. The thrasher probably nests in every

Fig. 20. — Nesting and migration seasons of the brown thrasher in different regions of the state (see Fig. 1). Spring and fall graph lines show the highest daily counts of each 2 days (left hand scale). The lines are interrupted where data have not been collected. Shaded block indicates length of the nesting season and level of adult nesting population. Circle points represent censuses in the Illinois valley; solid points represent east-central Illinois. Egg-laying graph line (right hand scale) is based on repeated searches of roadside habitat throughout the nesting season.

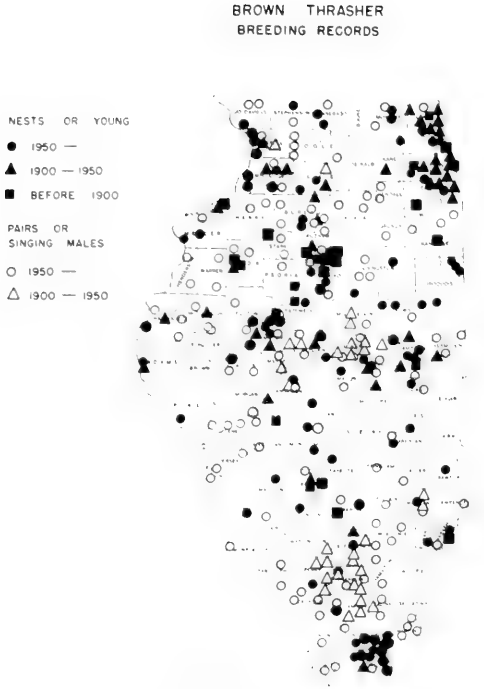

Fig. 21. — Breeding records for the brown thrasher in Illinois. Singing male records are for June only.

township in Illinois, yet published nesting records are lacking for many counties in the state (Fig. 21).

Nesting Habitats and Populations

The favorite habitats of the thrasher, judging from population densities, are hedgerows and other roadside or field edge plantings, thickets, and shrub-grown areas (Ridgway 1889, Gates 1911, Beecher 1942). The species also nests in woodlands, both natural forests and those modified by man (Beecher 1942). The thrasher is a species of the forest edge and not the forest interior (Kendeigh 1944 and others). Holmes (1950), comparing bird populations of three forest habitats in Piatt County, found no thrashers in floodplain forest or upland forest, but a density of three pairs per 100 acres in forest edge. In southern Illinois the large block forests, even the forest edges, are relatively little used by thrashers.

The thrasher is as closely tied to edge situations, for example, hedgerows, as any Illinois species. The habitats it uses most are those that are the least available (Fig. 22) and probably most endangered. Furthermore, the data on residential habitat indicate that the thrasher is not

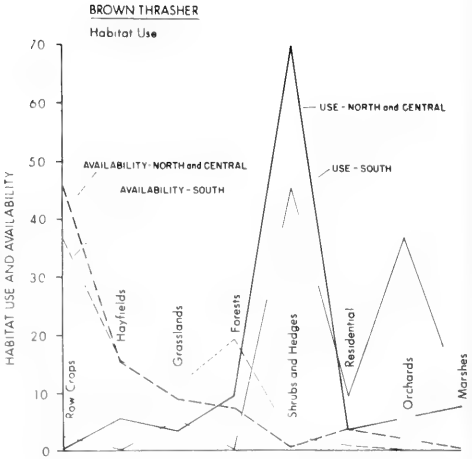

Fig. 22. — Availability of habitats for the brown thrasher (and, in general, for the mimids) in relation to their use. The scale shows the percent of Illinois land (availability) in each kind of habitat, and also the percent of the Illinois brown thrasher population (use) in each habitat.

very adaptive to man. Early in this century, thrasher populations were high in human residential areas, but now they are relatively low (Graber & Graber 1963).

The most apparent requirement of the nesting habitat is shrubby cover, and thorny and/or dense plants are particularly favored (Table 8). There was marked variation in the species of plants used for nesting between the southern and northern areas of Illinois. The list is undoubtedly incomplete, and we have no data on the relative availability of plant species used by thrashers. Loucks (1891) felt that most nests in the Peoria area were placed in "hedges," i.e., osage orange. In northeastern Illinois, Benjamin Gault (field notes, 1885–1915) also recorded most thrasher nests in osage orange. Nearly all nests in forest edge habitat in Piatt County were in hawthorns (Allison 1947, Weise 1951). The species also nests on the ground, and Musselman (1920) recorded thrashers nesting 2 years in a bird house with the top raised.

Population figures for the thrasher in major habitats (Table 9) show marked regional variation, and some variation from year to year. There is evidence that the thrasher population in Illinois has declined greatly since the turn of the century, especially in the south (Graber & Graber 1963).

The only data available on the size of nesting territories of brown thrashers is for forest-edge habitat in Piatt County (Allison 1947, Hensley 1948, and Reese 1949). Territories averaged 1.6 acres in 1946, 2.8 in 1947, and 2.7 in 1948. They were larger when the population was lower, and smaller when it was higher (Hensley 1948).

TABLE 8. — Plants used by brown thrashers as nest sites (excluding 212 nests found in a special study of osage orange hedgerows in central Illinois).

Plants	Percent of Total Nests		
	North (116 Nests)	Central (136 Nests)	South (62 Nests)
Osage orange (*Maclura pomifera*)	39	41	5
Multiflora rose (*Rosa multiflora*) + *Rosa* sp.	5	8	24
Red cedar (*Juniperus virginiana*)	1	1	31
Grape (*Vitis* sp.)	10	5	2
Honeysuckle (*Lonicera* sp.)	2(*shrub*)	2(*shrub*)	13(*japonica*)
Crabapple and apple (*Malus* sp.)	4	2	3
Elm (*Ulmus* sp.)	3	1	3(*alata*)
Hawthorn (*Crataegus* sp.)	6	18	
Gooseberry (*Ribes* sp.)	6	3	
Box-elder (*Acer negundo*)	3	2	
Mulberry (*Morus* sp.)	2	3	..
Lilac (*Syringa vulgaris*)	1	4	..
Oak (*Quercus* sp.)	3	..	2
Bramble (*Rubus* sp.)	3	1	
Willow (*Salix* sp.)	1	1	
River birch (*Betula nigra*)	1	1	..
Sassafras (*Sassafras albidum*)	..	..	5
Dogwood (*Cornus* sp.)	4	..	
Wild plum (*Prunus americana*)	..	4	
Virginia creeper (*Parthenocissus quinquefolia*)	3		
Mock orange (*Philadelphus* sp.)	..	..	3
Trumpet-creeper (*Campsis radicans*)	..	..	3
Blackhaw (*Viburnum prunifolium*), and *Viburnum* sp.	2		
Pine (*Pinus* sp.)	2	..	..
Greenbrier (*Smilax* sp.)	..	..	2
Bittersweet (*Celastrus scandens*)	..	..	2
Spirea (*Spiraea* sp.)	..	..	2
Snowberry (*Symphoricarpos* sp.)	..	1	.
Hazel (*Corylus americana*)	1	..	
Golden-bell (*Forsythia* sp.)	1	..	
Beauty-bush (*Kolkwitzia amabilis*)	..	1	

Nesting Cycle

Banding data provided by Lyon (1921), Lincoln (1927), Bartel (1942, 1943), and Jurica, et al. (1959, 1960, 1962) show that at least some of both juvenile and adult thrashers return to the same summer home after the migration, but there are no quantitative data on year-to-year homing and survival.

Courtship and territorial behavior by thrashers must begin almost immediately after the birds arrive from the wintering grounds (Fig. 20). Several authors refer to the fact that the males arrive singing. To Ridgway (1889), as to most listeners, the thrasher was a superior songster. The song, sweet but loud, is often delivered from the top of a tree, and characteristically has fewer repetitious notes (usually not more than three) than the song of the mockingbird. Ridgway (1874), who spent many years in Washington, D.C., felt that the thrashers of southern Illinois sang more vigorously than those in the East. In northeastern Illinois Gault (1901) noted that thrashers begin to grow listless during June, and the singing is much reduced. In addition to the loud song, there is a very soft, more complex whisper song, usually uttered while the bird is low in a shrub or thicket, and probably heard most often in the early part of the nesting season (Coffin 1915, Schafer 1916). During much of the nesting season, and in late summer especially, an observer is more likely to hear the loud "smack" alarm call than the song.

The nesting season, the period between the onset of nest building and the fledging of the last young of the year, lasts from about April 1 to August 12 in southern Illinois, from April 15 to August 21 in the central zone, and April 15 to August 25 in the north (Fig. 20). In terms of what most of the thrasher population does, however, the nesting season is much shorter than these dates indicate. For example, most of the egg production occurs in April in southern Illinois, and in May in the central and north (Fig. 23).

The minimum time required from the onset of nest-building to the fledging of (three) young was 32 days for a nest in Ford County. In this case nest construction required 4 days, egg-laying 3 days, incubation 13 days, and the nestling stage 12 days. One nest we observed which looked complete when it was found went 13 days before the clutch was started. Incubation periods were nearly always 12½–13 days, but one clutch in the north took 14 days. One female incubated eggs with dead embryos at least 16 days but abandoned by the 22nd day. Young usually fledged in 12 or 13 days, but one stayed at least 14 days.

Data on the plants used for nest sites are presented in Table 8. Most thrasher nests are found 2–5 feet above ground in northern and central Illinois, and 3–6 feet in the south (Fig. 24). About 5 percent of the nests recorded in central and northern Illinois have been ground nests, but there are apparently no such records for southern Illinois. Nearly all ground nests have been near shrubby cover, frequently at the bases of shrubs, but Kennicott (1853–1854) mentions finding several nests under fences in the prairie. The height of nests in osage orange trees in Ford County tended to vary with the season as in the case of the mockingbird in the south, with the early nests being lower (April-May: 3 feet; June-July: 5 feet).

Brown thrashers lay their eggs early in the morning (Silloway 1906) and on consecutive days. Most April-May nests receive four eggs and most June-July nests have three eggs (Table 10). Clutches of five eggs are decidedly more common in the northern region of the state than in the central or south (Table 11). In some years large clutches are particularly prevalent, e.g., in 1933 (Blocher 1933) and 1914–1915 (Sanborn & Goelitz 1915), but the cause of this annual variation is unknown. True two-egg clutches are apparently very rare; most nests found with two eggs have probably lost eggs one way or another. One nest we observed received seven eggs from two females, in two laying sequences — a four-egg clutch laid May 13–16 and a three-egg clutch laid May

Table 9. — Breeding populations of brown thrashers in various Illinois habitats.

Habitat	Acres	Birds Per 100 Acres[a]	Years	Type of Census	Region or County	Reference
Hedgerows	9	144	1937	Nest	Ford (C)	Graber, unpubl. data
	8	189	1957–1958	Strip	Central	Graber & Graber 1963
Edge shrubbery	11	61	1957 1958	Strip	North	Graber & Graber 1963
	13	68			Central	
	20	76			South	
Thickets	7	113	1937	Nest	Lake (N)	Beecher 1942
	13	23	1950	Nest	Jackson (S)	Brewer & Hardy 1950
Block shrub areas	32	28	1957–1958	Strip	North	Graber & Graber 1963
	49	12			Central	
	107	2			South	
	60	2	1949	Nest	Richland (S)	Stine 1949
Early shrub		24	1966	Nest	Vermilion (C)	Karr 1968
Late shrub		28	1966			
Orchard	78	12	1957 1958	Strip	South	Graber & Graber 1963
Second growth or cut-over woods	15	86	1937	Nest	Rock Island (N)	Fawks 1937
	15	57	1938			Fawks 1938
	56	36	1941	Nest	Sangamon (C)	Robertson 1941
	56	39	1942			Robertson 1942
	56	25	1944			Robertson 1944
	46	14	1948			Robertson & Snyder 1948
Virgin floodplain forest	77	2	1948	Nest	Sangamon (C)	Snyder, et al. 1948
Grazed bottomland	93	2	1955	Nest	Macon (C)	Chaniot & Kirby 1955
Forest (all types including edge)	177	1	1957 1958	Strip	North	Graber & Graber 1963
	214	8			Central	
	340	0			South	
	27	15	1937	Nest	Lake (N)	Beecher 1942
	24	+[b]	1967	Nest	Hancock (C)	Franks & Martin 1967
Forest edge	55	0.2	1927 1948	Nest	Champaign (C)	Kendeigh 1944, 1948
	55	(0.8 birds/mile)	1949–1968	Nest	Champaign (C)	Kendeigh & Fawver 1949, Kendeigh & Forsyth 1959, and Kendeigh & Barnett 1968
Modified woodland	28	7	1937	Nest	Lake (N)	Beecher 1942
Parkland estates	100	18	1915	Nest	Cook (N)	Eifrig 1915
Residential areas	160	1	1957 1958	Strip	North	Graber & Graber 1963
	75	4			Central	
	98	3			South	
Swampy prairie	67	9	1941	Nest	Sangamon (C)	Robertson 1941

[a] All figures were converted to read birds per 100 acres or birds per mile of edge (number of territorial males or nests × 2).
[b] Less than one.

22–24. Eggs in the first clutch never developed embryos, but the second clutch was successful.

Cowbird parasitism is probably not a significant problem for the thrasher, although the incidence may be high at times. Miller (1955) reported two nests parasitized (of seven found) in farmland in Champaign County, and Hensley (1948) reported one parasitized (of two found) in forest edge habitat of Piatt County. In the northern region only 2 percent of 83 nests that received full clutches were parasitized. The incidence for all central Illinois nests with adequate data also was 2 percent. We have data on only 39 nests for southern Illinois, 1 of which was parasitized. Parasitized nests fledged thrashers but not cowbirds, although in one nest a cowbird survived 6 days. Silloway, in a typed manuscript in 1924 entitled "Birds of the Peoria Parks," and Hensley (1948) reported the selective removal of cowbird eggs from thrasher nests, presumably by the adult thrasher. The incidence of parasitism was higher for the thrasher than for the other two mimids, and thrasher eggs more closely resemble cowbird eggs (Fig. 25).

Juvenile thrashers may be seen out of the nest as early as April 27 in southern Illinois (Ridgway 1925), and May 18 in central and northern Illinois.

Nesting Success

The laying curve for the thrasher (Fig. 23) suggests that most thrashers are not double brooded. Because of parasitism, predation, infertility, and other causes, they appear to have trouble enough producing one brood (Table 12), and we suspect that most June-July nests represent repeated nestings after earlier failures. In nests that we observed, only about a third of the eggs layed produced fledglings (Table 12). These data refer to

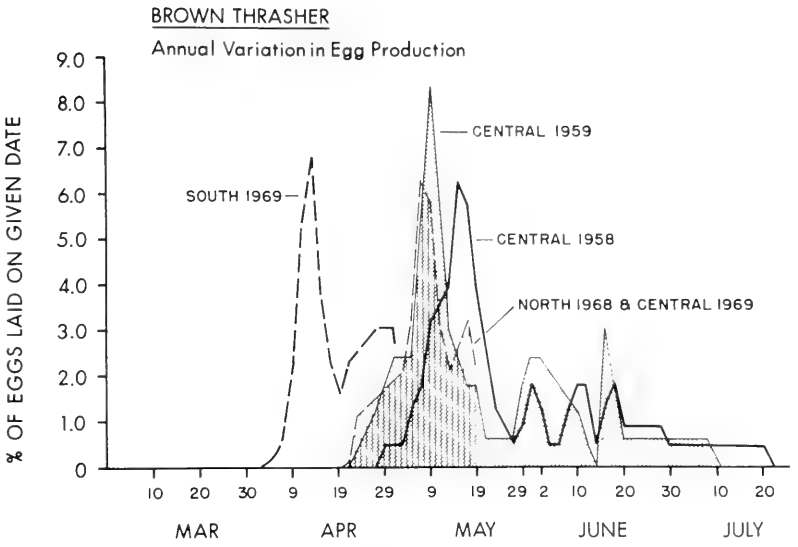

Fig. 23. — Annual and regional variation in egg production by brown thrashers. Note especially the very early nesting cycle in southern Illinois. Lines are interrupted where data have not been collected.

thrashers in hedgerows or similar linear habitats, and nesting success may be very different in other situations.

Although in general there was little difference in nest survival between regions (Table 12), our observations indicate that the nesting problems are actually very different from place to place. For example, in the Ford County population the incidence of "infertility," i.e., no embryonic development following incubation, was 11 percent in eggs from full clutches, but it was only 1 percent in our sample of eggs in northern Illinois, and 3 percent in the southern region sample. In another 3–5 percent of the eggs (all regions), the embryos died before hatching. In the samples of central and southern Illinois nests, we found a few nests in which the young birds perished, not from predation but from some other cause, possibly low temperatures. Such nestlings accounted for about 3 percent of the eggs in nests with full clutches.

Our judgment on the causes of mortality in the remainder (the majority) of nest failures is based on circumstantial evidence. We suspect that in the northern and central study areas, the fox squirrel *(Sciurus niger)* is a significant predator on thrasher nests. We have never

Table 10. — Seasonal variation in clutch sizes of brown thrashers in Illinois.

Months	Total Nests	Percent of Nests by Clutch Size			
		5 Eggs	4 Eggs	3 Eggs	2 Eggs
April-May	203	6	68	25	1
June-July	64	1	34	63	1

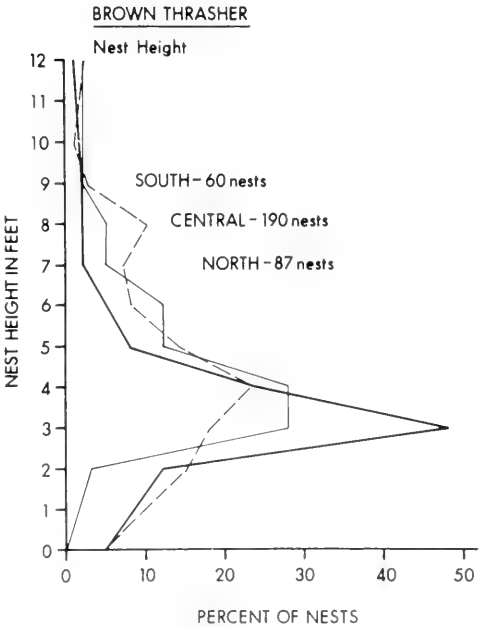

Fig. 24. — Percentages of brown thrasher nests at different heights in roadside habitats in different regions of the state. Heavy solid line represents central, light solid line southern, and dotted line northern Illinois.

Fig. 25. Brown thrasher nest (not in situ) with eggs, slightly smaller than life size. The eggs, usually 3 or 4, are whitish or [illegible], sparingly marked with reddish brown.

[illegible]essed the actual predation, but have found squirrels in nests that were recently active. In these instances the squirrel had placed green leaves in the nest and was using it as a diurnal resting place. In southern Illinois, the predator we saw at or near nests most frequently was the black rat snake. In north-central Illinois we once saw a fox snake (*Elaphe vulpina*) eating thrasher eggs. However, we have too little data on the identity and populations of nest predators to understand their effect. Like mockingbirds and other species, thrashers will vigorously attack even large snakes but without much effect. An interesting account of such an attack is given by Nilsson (1957).

Fall Migration

By mid-August a few thrashers appear to have completed the molt, but most are still ragged and molting. By early September most of them are in fresh plumage.

There is wide discrepancy in the departure dates for this species recorded in the literature, ranging from mid-August to late November. Even in July we have noted the seeming disappearance of thrashers from a local population. We have no idea where these birds go, or even, with any certainty, that they actually go, but the observations indicate a definite change in the birds' behavior.

Most of the departure dates recorded in the literature

TABLE 11. Clutch sizes of brown thrashers in different regions of Illinois.

Region	Months, Years	Total Number of Nests	Average Clutch	Percent of Nests by Clutch Size			
				5 Eggs	4 Eggs	3 Eggs	2 Eggs
North	April-May, 1968	56*	4.1	20	68	12	0
Central	April-May, 1958	52	3.7	0	71	29	0
	April-May, 1959	36	3.7	0	69	31	0
	April-May, 1968-1969	117	3.7	1	72	27	0
South	April-May, 1967	30	3.6	3	57	37	3

*Includes records from literature where complete data were provided.

TABLE 12. — Fledging success of brown thrashers (computed by exposure-day method, Mayfield 1961).

Region	Year	April-May				June-July			
		Number		Percent Fledged		Number		Percent Fledged	
		Nests	Eggs	Nests	Eggs	Nests	Eggs	Nests	Eggs
Northwest	1968	34	124	25[a]	20	17	48	46	38
East Central	1958	55	198	41	34	29	96	33	30
	1959	40	148	48	38	24	67	60	53
Southeast	1967	34	119	44	42	12	36	29	29

[a] Success exceptionally low because of a number of nests lost in a very severe hailstorm.

are in September and October for northern and central Illinois. There are few records for the southern zone. Our census data (Fig. 20) show the onset of apparent population changes in mid-August in central and northern Illinois, and in late August in the southern part of the state. The highest migrant populations occur throughout September in all regions, falling fast in early October (north and central) or late September (south). There appears to be a sparse but fairly regular trickle of migration throughout November, but these birds may be the winter residents.

The thrasher is a surprisingly infrequent victim among the migrants killed at television towers in Illinois in view of the number of thrashers seen on the censuses and the number of catbirds killed at these towers. In a sample of many thousands of birds picked up at central Illinois towers, thrashers comprise only one-tenth of 1 percent of the total.

As in the case of the catbird, we have never heard a recognizable thrasher call during the hundreds of hours we've spent listening to the night calls of migrants.

As in the spring, fall numbers of thrashers were highest in central Illinois, and lowest in the southern region. Despite an expected population increase from spring to fall, the fall counts of thrashers were never as high as the spring counts. For the state, in general, we saw about two thrashers in the spring to one in the fall, and in west-central Illinois the discrepancy was especially great (spring: five; fall: one).

There are only a few published recovery records for thrashers banded in Illinois (Lincoln 1927, Bartel 1945). Winter recoveries are from Mississippi, Louisiana, and southern Arkansas, about 600–700 miles south or slightly west of south of the place of banding (Fig. 26). Two especially interesting recoveries were from birds banded as nestlings from the same nest by Bartel (1945) at Blue Island in May, 1937. One was found at Baton Rouge, Louisiana, November 7, 1937, and the other was shot at Crossett, Arkansas, January 15, 1938.

Winter Records

In the past several years, thrashers have been recorded somewhere in the state every winter (Fig. 27). Prior to 1940, the Audubon Christmas count coverage was poor because the number of observers was relatively small, especially in southern Illinois. Thrashers were recorded on only about 2 percent of all Christmas counts in northern Illinois, and 4 percent of the counts in the central zone (Fig. 28). With increasing coverage after 1940 the frequency of occurrence has been generally increasing, even out of proportion to the number of ob-

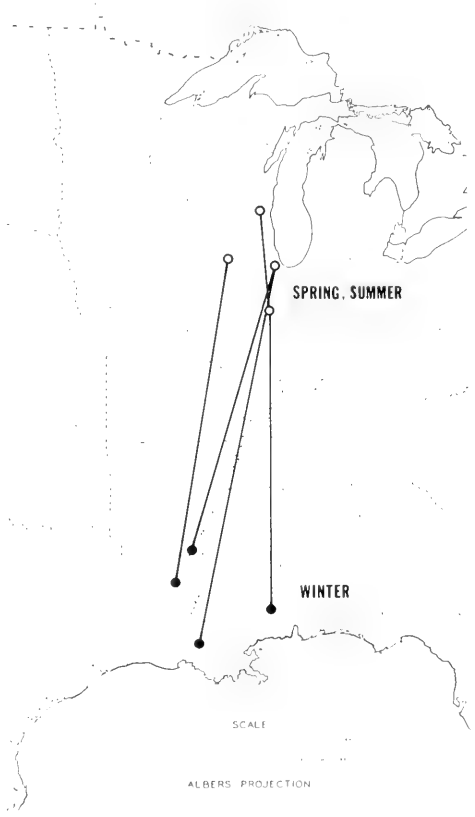

Fig. 26. — Recovery records of brown thrashers banded in Illinois. The only spring recovery was due north in Wisconsin.

servers. Thus we feel that thrashers are actually wintering in Illinois in greater numbers now than in prior decades.

Food Habits

Very little information is available on the food of the thrasher in Illinois other than that from Forbes (1879, 1880), based on his studies of specimens from northern and central Illinois (Fig. 29). There is no information on the thrasher's food in southern Illinois, or on what they feed their young, and it is obvious that we need expanded and comparative modern-day studies in this area.

The thrasher's food habits reflect seasonal variations in the availability of foods, and a large amount of ground foraging. Beetles in general comprised an important part of the thrasher's spring diet. In Lake County, Coale (1910) found thrashers attracted to an abundant supply of earthworms at bare places on a road in April. Forbes' (1880) studies showed seeds and grain, especially corn, to be important in the April diet. From June on through the summer, fruit became more important in the diet, and thrashers, like catbirds, were a source of irritation to many old-time orchardists (Kinney 1868). We have seen thrashers feeding on pokeberries in September and on barberries (*Berberis* sp.) in October-November.

A number of writers have commented on the thrasher's behavior at bird feeders. Though shyer than the catbird (Jacques 1927), thrashers do visit feeding stations, and in summer bring their young. Ridgway (1918, 1923) noted the thrasher's fondness for nutmeats, including cracked black walnuts (*Juglans nigra*), for her birds at Olney. Thrashers visiting a Cook County feeder in winter and spring ate only nutmeats and sunflower seeds (Fisher & Fisher 1941). Thrashers are also attracted to bird baths, especially ground pools.

Longevity

The oldest Illinois thrasher on record was a bird banded by Musselman (1958) at Quincy, July 5, 1950, and recaptured at the same place April 27, 1958, nearly 8 years later. Bartel (1967) recovered one of his thrashers 4 years after banding it. There are no data on average longevity for any Illinois population.

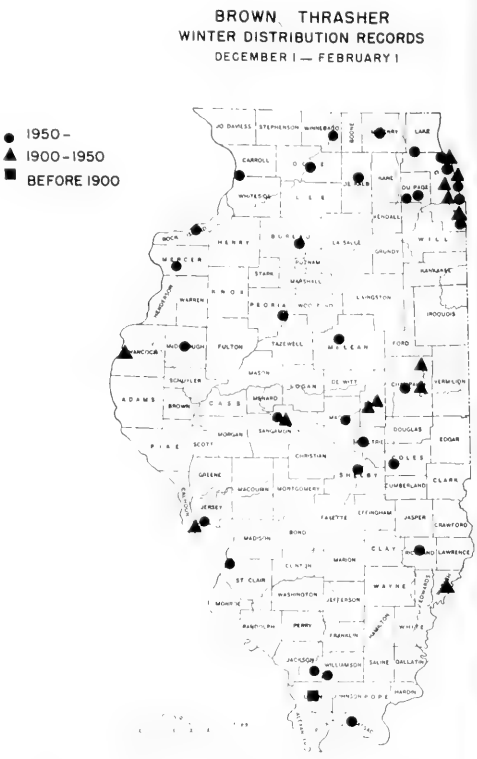

Fig. 27. — Brown thrasher winter records in Illinois.

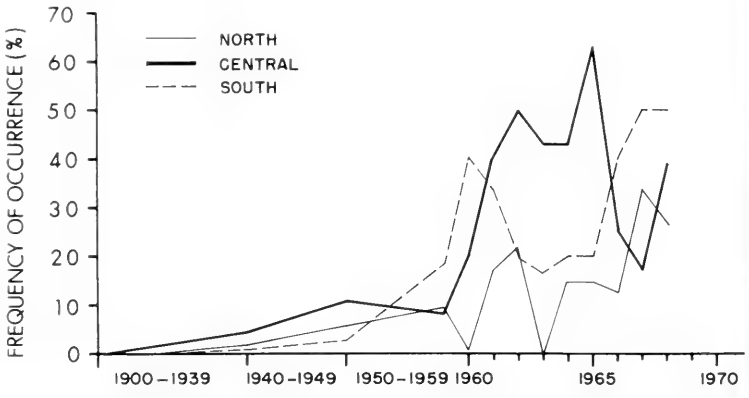

Fig. 28. — Variation in the frequency of sightings of brown thrashers on the Audubon Christmas counts for different periods of years and different regions of Illinois (annual variation after 1959).

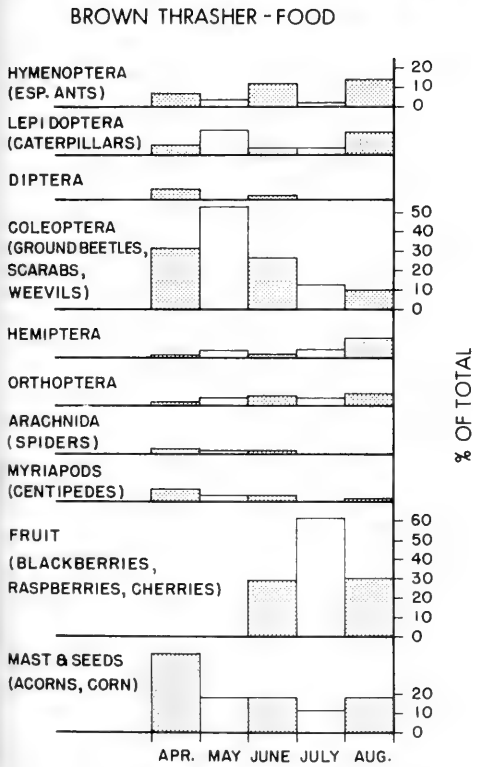

Fig. 29. — Food habits data on the brown thrasher from the study of Forbes (1880). Percentages represent the part of the total food identified in the stomachs of a number of thrashers examined each month.

On the whole field of diseases and parasites there is but one paper (Sachs 1953). It gave the incidence of blood parasites in a sample of 23 thrashers, as follows: *Haemoproteus*–17 positive, *Trypanosoma*–2 positive, *Leucocytozoon*–1 positive.

Bartel (1960, 1962) recorded the thrasher among the species which disappeared from an area in Cook County that was sprayed with heptachlor epoxide. Scott, et al. (1959) also reported a notable kill of thrashers in Iroquois County following aerial application of dieldrin at the rate of 3 pounds per acre.

Because thrashers frequent roadside vegetation, they would seem to be susceptible to problems with modern traffic. There are no recent studies, but Flint (1934–1935) and Starrett (1938) provided data on the question for an era when traffic was thinner and slower. The highest kill was in east-central Illinois in 1930 when Flint (1934–1935) found a thrasher for every 125 miles driven, and thrashers comprised about 2 percent of all the birds killed by moving vehicles.

SAGE THRASHER *(Oreoscoptes montanus)*

There have been at least two reports of this western species in Illinois, a May sight record of questionable validity for Lincoln Park, Chicago (see Clark & Nice, 1950:31), and a very carefully documented and valid record of a bird at Winnetka in winter, 1969–70. The bird was discovered and identified independently by Mrs. Irene Binford and Mrs. Kenneth McKeown. The thrasher was also studied closely by Dr. Laurence C. Binford, Charles T. Clark, Robert P. Russell, and many other observers, and was also photographed. The bird visited feeding stations in Winnetka, and was present from at least December 26, 1969 to March 8, 1970.

Such records of birds, apparently way out of range, are inconsequential to the ecology of Illinois, but they are, nonetheless, always exciting to the student of birds.

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