

SEASONAL MOVEMENTS OF BLACKBIRDS ACROSS THE ARCHIPELAGO OF WESTERN LAKE ERIE¹

MILDRED MISKIMEN, U.S. Fish and Wildlife Service, Ohio Field Station, Patuxent Wildlife Research Center, Sandusky, Ohio 44870

Abstract. A 3 year (1971, 1972, 1973) study of spring and autumn inter-island movements of blackbirds across the Lake Erie archipelago showed that not all flights were unidirectional. Daily flights between roosting and feeding areas occurred in many directions and only the net movements were north in the spring and south in the fall. Each year the spring movements started between March 1 to 17 and ended between May 5 to 23 with an average period of 65 days. Fall migration usually occurred in October and November. Patterns of flight roosting and feeding appeared to change when small flocks united with larger flocks. Canada may provide late-summer and early-fall feeding places for blackbirds nesting in northern Ohio.

OHIO J. SCI. 76(5): 195, 1976

Blackbird flights across Lake Erie by way of the western archipelago have been noticed for many years. Taverner and Swales (1907-1908) and others have reported on the importance of this route to migrating birds of many species from observations beginning about 1879. My interest in the role of the islands in blackbirds' lives began with observations of a blackbird roost in a cedar woods on South Bass Island (fig. 1). For at least 30 years, about 2 acres of red cedars (*Juniperus virginiana*), with a border of sugar maples (*Acer saccharum*), was regularly occupied from early March through November by red-winged blackbirds (*Agelaius phoeniceus*), common grackles (*Quiscalus quiscula*), brown-headed cowbirds (*Molothrus ater*), starlings (*Sturnus vulgaris*), and other migrant and resident birds. I observed the roosting behavior at irregular times for 12 summers (beginning in 1959) and often saw blackbirds come to the roost in large flocks from the United States mainland and also from North Bass and Middle Bass Islands, mostly in the hour before sunset. In the mornings, comparable numbers left the Island, some flying south toward the mainland and others flying north toward the northern islands. Although no birds or flocks were marked,

it appeared that many birds using this roost at night must feed during the day on other islands or the mainland, returning to the roost in the evening. These informal observations were the basis upon which I planned the present 3-year study to determine the relative numbers of blackbirds engaged in north-bound and south-bound flights, their patterns of movement and the role of the cedar roost in these movements.

METHODS AND MATERIALS

The study was conducted from March through November of 1971, 1972, and 1973. Estimates of changes in the rate, volume, and direction of blackbird movements to and from South Bass Island were made, and related to changes in environmental and biological variables, by daily morning and evening observations of inter-island flights across the archipelago. I chose the hour immediately after sunrise and the hour immediately before sunset for sampling because blackbirds at these times usually were active and many flights centered around the roost. Inter-island flights occurred at other times on most days, but their counts were not included here.

Two observation posts were used. One was located at the end of a narrow peninsula on the north shore of South Bass Island, known locally as Peach Point (hereafter PP) (fig. 1). Looking north from PP one can see United States and Canadian Islands as far away as East Sister Island (12 miles) and Pelee Island (15 miles). Using field glasses, I could easily follow flocks of birds to the vicinity of these northern islands. The other observation post was located on the southwestern tip of South Bass Island in the vicinity of Miller's Lime Kiln

¹Manuscript received January 23, 1976 and in revised form May 5, 1976 (#76-8).

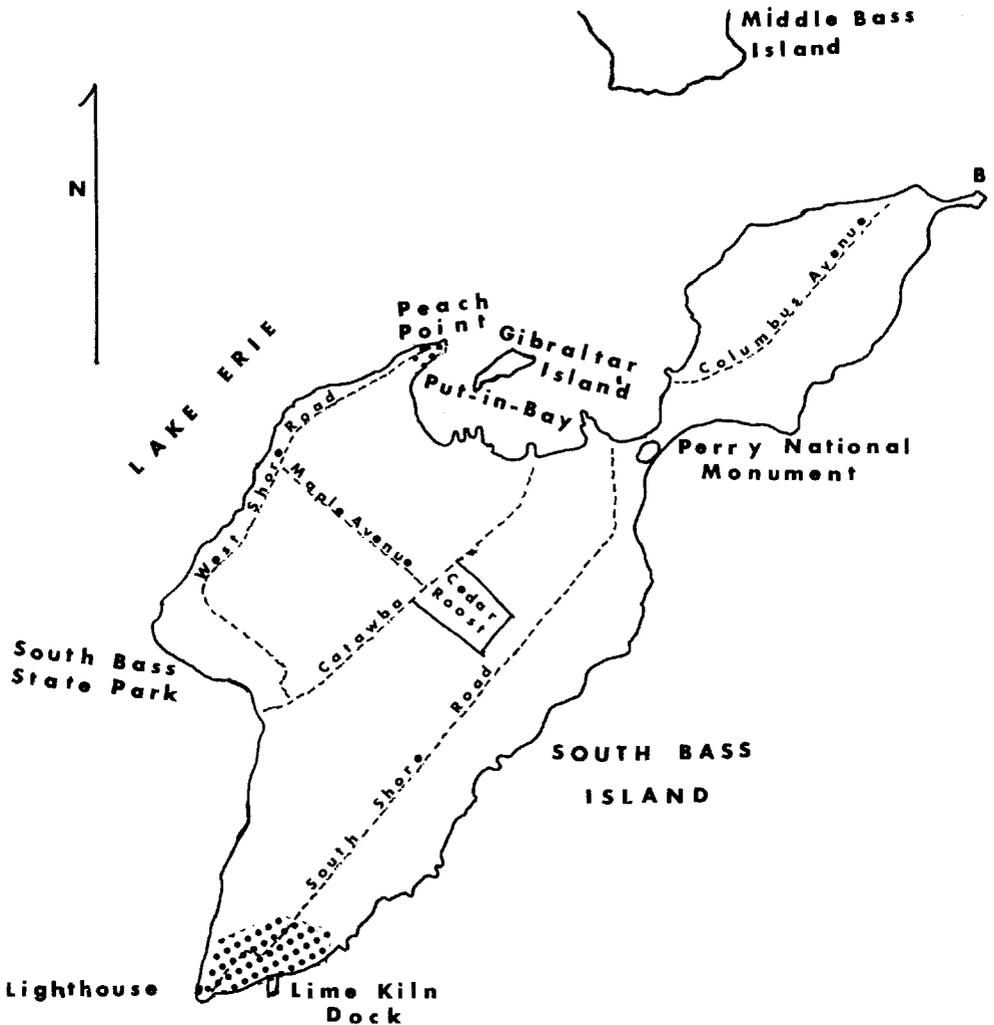


FIGURE 1. South Bass Island. Shaded areas denote sites of observation. B indicates Buckeye point.

Ferry Dock (hereafter LK). This area commanded a view of the United States mainland, only 3 miles away at the nearest point, Catawba Peninsula. One can see mainland shore as far east as Marblehead Peninsula and west to Locust Point. Many marshes lie within this span, and flocks of blackbirds flying between islands and mainland usually focused on the LK area.

With as few interruptions as possible, I made morning and evening observations from one of the stations: Monday, Wednesday, and Friday from PP; Tuesday, Thursday, and Saturday from LK area. I recorded sizes, number, and composition of flocks; direction and approximate altitude of flights; weather data; and other pertinent information. A large proportion of flocks was of mixed species, sexes, and

ages. So, in summarizing the data, I treated them as unspecified blackbirds. I tried not to include starlings with the counts of redwings, grackles, and cowbirds but they could not be accurately separated in large flocks.

Inter-island spring movements of blackbirds were separated from late summer and fall movements by a period of nearly 2 months in late May, June, and early July when my assistant and I saw no flights at the selected observation times and places. The data are therefore treated as separate spring and fall migrations and divided according to the place of observation (LK on the southwest end of the Island and PP off the north shore) and general directions of flight (generally northward or southward from each station). For this analysis, northeast and northwest are included with

north (N) and southeast and southwest are included with south (S).

RESULTS

Use of the cedar roost by blackbirds continued through 1971 and early spring of 1972. After early April 1972 and through 1973, large flocks of blackbirds no longer roosted in the cedars though small numbers were there at times. Redwings and grackles also roosted at various places on the Island in groves of oaks (*Quercus spp.*) and maples, brushy fields, and tall grasses. The vegetative composition of the cedar grove was unchanged from previous years and the amount of human and predator disturbance apparently did not change, and new roosting places had not changed from previous years. Changes in blackbird roosting sites coincided with changes in flights between islands, and the two occurrences may be related.

SPRING MIGRATION

FIGURE 2. NORTHWARD AT LIME KILN; BIRDS FLYING FROM THE UNITED STATES MAINLAND TOWARD THE OBSERVER ON THE SOUTHWEST END OF SOUTH BASS ISLAND.

During the 76 days between March 8 and May 23, 1971, 1,515 blackbirds flew north from the mainland to South Bass Island (50% during the first 34 days and 90% in 48 days). In 1972, flights began on March 17 and ended 56 days later on May 12, with a total of 3,386 birds (50% during the first 28 days, and 90% in 42 days). In 1973, the observed spring migration began on March 3 and ended 63 days later on May 5, with a total of 4,149 birds (50% during the first 35 days and 90% in 49 days). The average rate of spring migration north as seen from the LK area was 50% in 32.3 days, 90% in 46.3 days, and 100% in 65 days.

FIGURE 2. NORTHWARD AT PEACH POINT; BIRDS FLYING FROM SOUTH BASS ISLAND AWAY FROM THE OBSERVER TOWARD CANADA AND THE NORTHERN ISLANDS.

In 1971, the spring migration began on March 1 and ended 70 days later on May 9, with a total of 5,008 birds observed (50% during the first 22 days, and 90% in 56 days). In 1972, the season was 56 days long March 17–May 12, with 3,123 birds recorded (50% during the first 14 days and 90% in 28 days). In 1973, the season began on March 3 and ended in

63 days with 7,325 birds recorded (50% during the first 14 days and 90% in 35 days). The average rate of spring migration north from PP was 50% in the first 16.3 days, 90% in the first 39.7 days, and 100 percent in 63 days.

FIGURE 3. SOUTHWARD AT LIME KILN; BIRDS FLYING FROM SOUTH BASS ISLAND AWAY FROM THE OBSERVER TOWARD THE UNITED STATES MAINLAND.

Flights south from LK in 1971 extended for 76 days, from March 8 to May 23, with 4,593 birds recorded (50% during the first 21 days, and 90% in 72 days). In 1972, the season was from March 17 to April 28 (42 days) with 1,888 birds recorded (50% in the first 7 days and 90% in 14 days). In 1973, the record extended from March 3 to May 5 (63 days) with 5,756 birds (50% during the first 14 days, and 90% in 21 days). The average rate of south blackbird movement for the 3 years at the LK observation post was 50% in the first 14 days of spring migration, 90% in 32.3 days, and 100% in 60.3 days.

FIGURE 3. SOUTHWARD AT PEACH POINT; BIRDS FLYING FROM CANADA AND THE NORTHERN ISLANDS TOWARD THE OBSERVER.

In 1971, blackbird flights were seen over a period of 34 days, March 29 to May 2; a total of 176 birds were seen (50% on the first day, and 90% in 20 days). In 1972, the season was 21 days, March 17 to April 7. The total of 37 birds was recorded on 3 days: 7 on March 17, and 15 each on March 31 and April 7. In 1973, 24 birds were observed at PP flying south; 10 on April 14, and 14 on April 28.

FALL MIGRATION

Except for 1971, blackbird movements in late summer and fall were sporadic.

FIGURE 4. SOUTHWARD AT LIME KILN; BIRDS FLYING AWAY FROM THE OBSERVER, FROM SOUTH BASS ISLAND TOWARD THE UNITED STATES MAINLAND.

In 1971, the first flights were observed on July 11 when three redwings flew south. Of the fall season's total of 5,355 birds seen crossing toward the mainland, 50% flew by September 19 and 90% flew by October 24. Flights continued until November 21, making 133 days in the season. In 1972, flights occurred at ob-

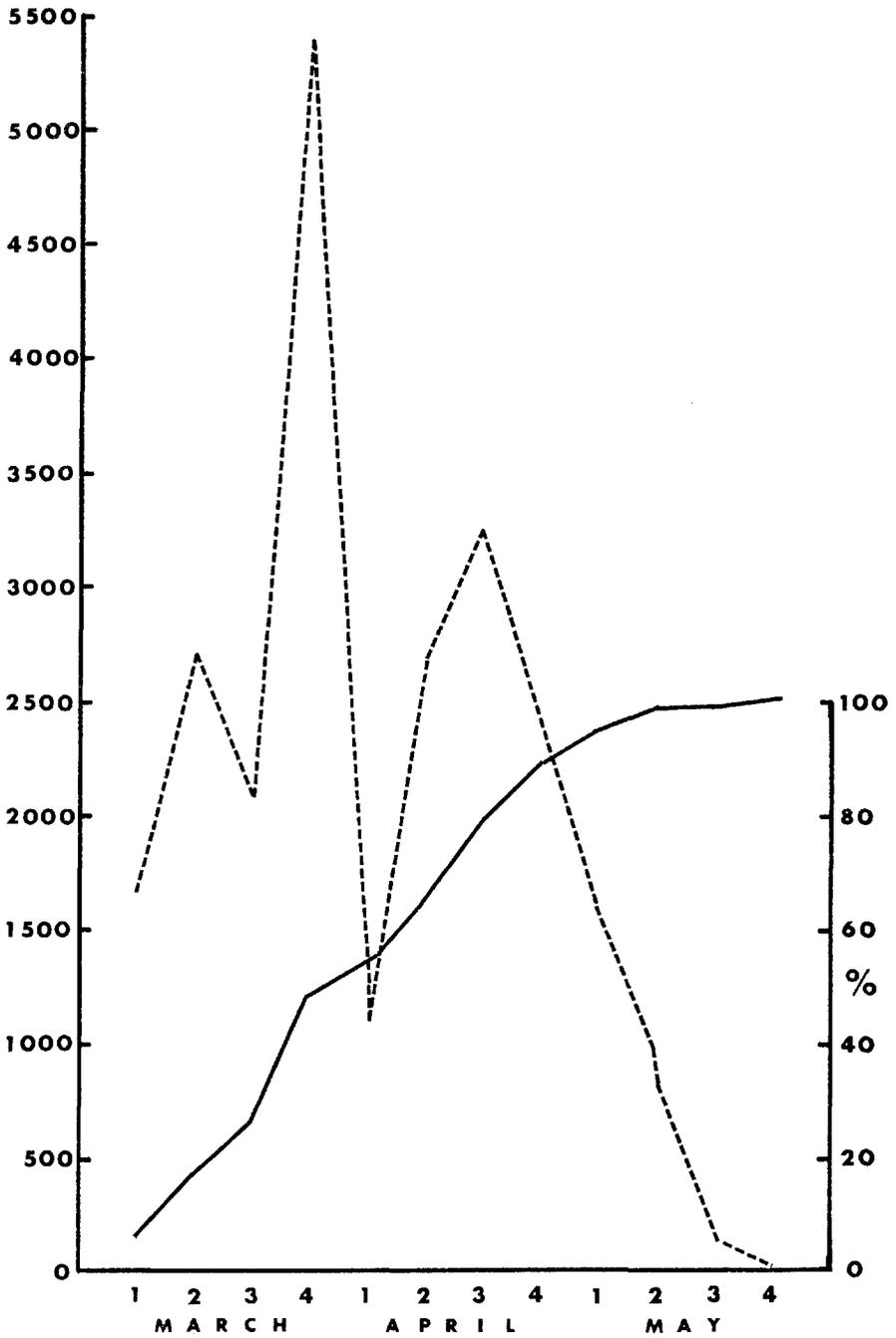


FIGURE 2. Spring movements of blackbirds north, combined data from Lime Kiln and Peach Point, 1971-1973. Dashed line shows observed birds plotted weekly. Solid line shows cumulative percent of bird numbers.

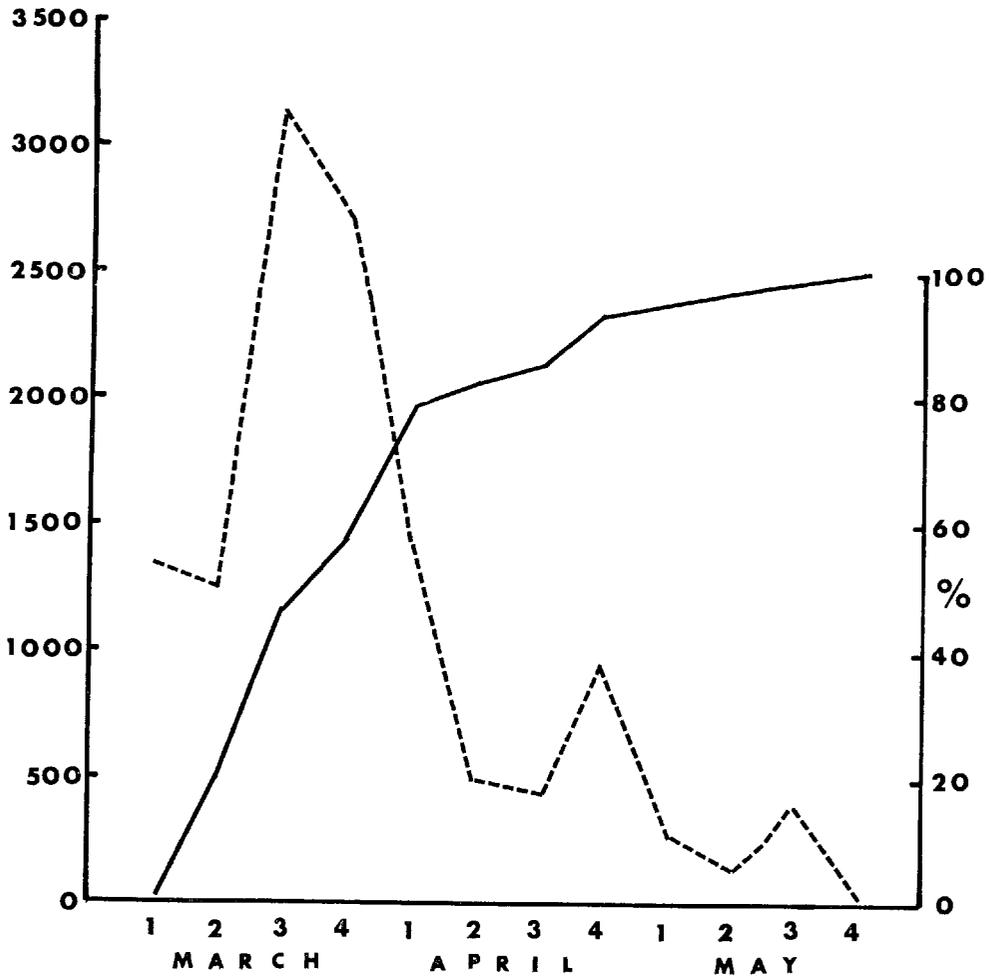


FIGURE 3. Spring movements of blackbirds south, combined data from Lime Kiln and Peach Point, 1971-1973. Dashed line shows observed birds plotted weekly. Solid line shows cumulative percent of bird numbers.

servations times on only 4 days: July 14, August 4, 11, and 25. The season's total was 83 blackbirds within 41 days. In 1973, I first saw south flights on October 6, 30 birds in all. On October 13, I recorded "countless thousands" in the field notes, and in the tables and graphs I recorded 10,000 for convenience of computation. On October 26 and 27, 1973, I recorded 388 and 700 birds, respectively, bringing the calculated total to 11,118 birds for the 21-day season.

FIGURE 4. SOUTHWARD AT PEACH POINT; BIRDS FLYING TOWARD THE OBSERVER FROM THE NORTHERN ISLANDS OR CANADA TO OR BEYOND SOUTH BASS ISLAND.

In 1971, birds flying south at PP were seen first on July 11. Fifty percent of the season's 258 birds flew by August 1, 90% and 100% by August 8, 28 days in all. In 1972, I recorded flights on only 2 days, 14 birds on July 14 and two on August 11. In 1973, I saw blackbirds flying south over PP on November 2 only. Flocks that day varied in size up to 200. The estimated total for the observation period was 450 birds.

FIGURE 5. NORTHWARD AT LIME KILN; BIRDS FLYING TOWARD THE OBSERVER FROM THE UNITED STATES MAINLAND TO SOUTH BASS ISLAND.

In August 1971, blackbirds flew north

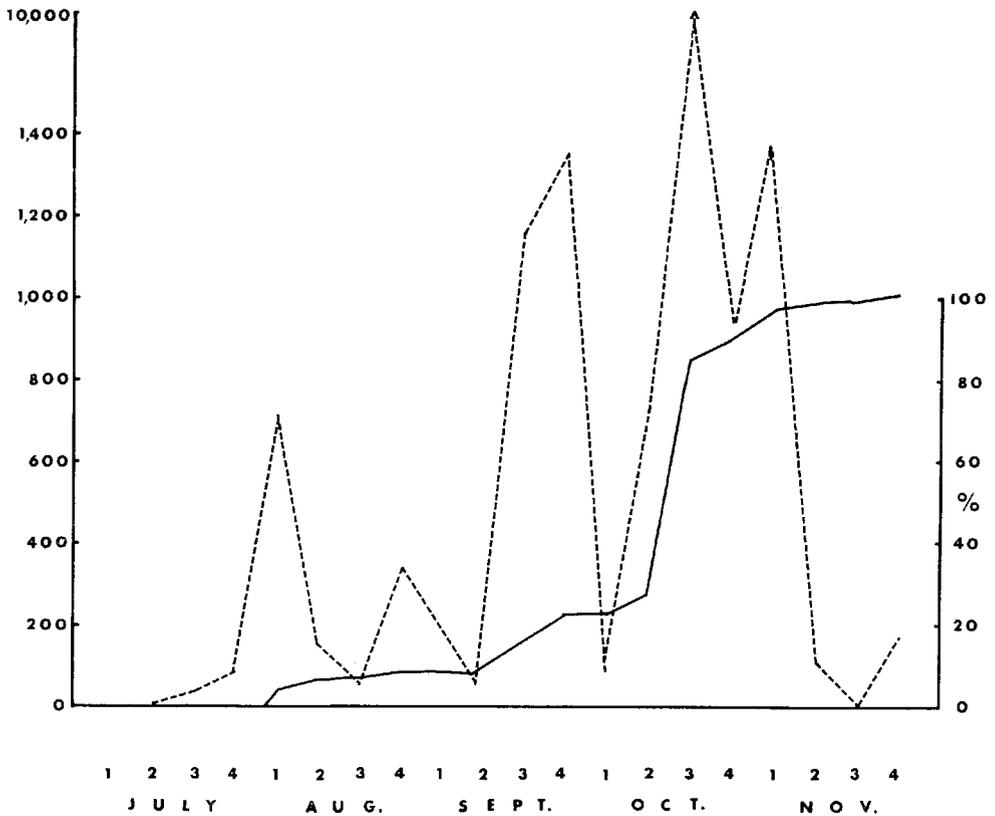


FIGURE 4. Fall movements of blackbirds south, combined data from Lime Kiln and Peach Point, 1971-1973. Dashed line shows observed birds plotted weekly. Solid line shows cumulative percent of bird numbers.

from Catawba Point and adjacent areas for 29 days. Of the total 507 blackbirds recorded for the period, 462 were recorded on the first day, August 1. The remaining 45 straggled, a few at a time, until near the end of the month. In 1972, the flight period was shorter and consisted of 8 days, 340 blackbirds on July 21 and 100 on July 28 (440 blackbirds in all). In 1973, I saw no northern flights to the LK area at any sampling period.

FIGURE 5. NORTHWARD AT PEACH POINT; BIRDS FLYING AWAY FROM THE OBSERVER, FROM SOUTH BASS ISLAND, TOWARD CANADA AND THE NORTHERN ISLANDS.

Blackbirds were seen flying north from PP in 1971 from July 4 through October 24, a total of 112 days. Fifty percent flew by August 1, and 90% flew by August 29. In all, 1,919 blackbirds were

counted during observation periods. The 1972 season was 28 days, July 21 through August 18, with 508 birds. More than half went in the first week and 90% went by the end of the third week. In 1973, I counted six blackbirds flying north on August 2, and estimated 300 blackbirds flying north on October 25, an interval of 85 days.

FIGURES 4 AND 5. COMBINED DATA FOR 3 YEARS, 1971-1973.

The combined fall data for 1971-1973 north-bound blackbirds, shows a peak in early August with a cumulative 80 percent of all northern movements. After that few flights north were recorded until the end of October. Flights south during the same 3 years, began in July, made small peaks in August and September, but did not reach cumulative 50 percent until early October. The curve reached

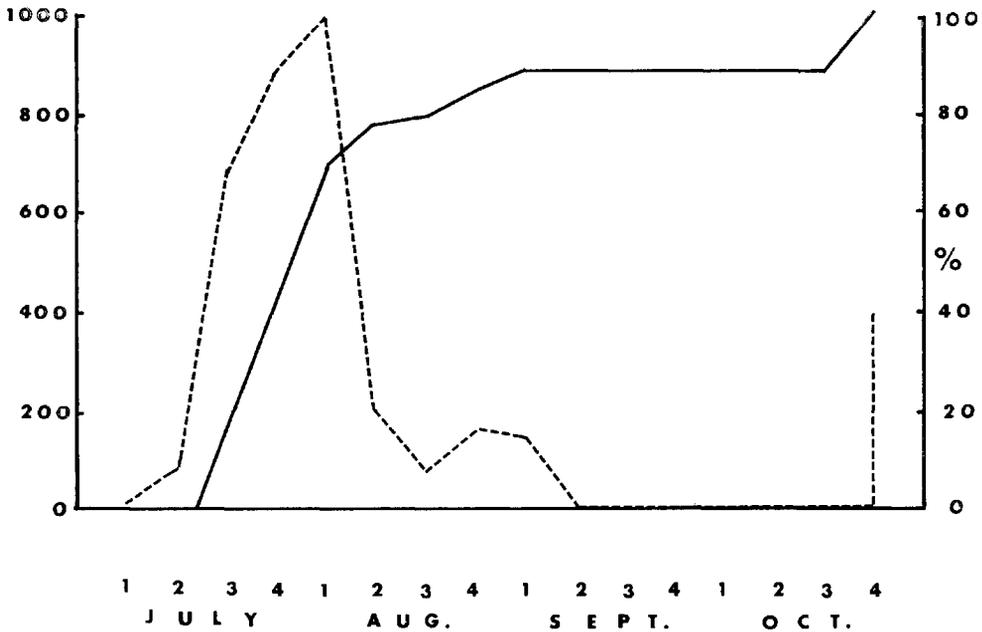


FIGURE 5. Fall movements of blackbirds north, combined data from Lime Kiln and Peach Point, 1971-1973. Dashed line shows observed birds plotted weekly. Solid line shows cumulative percent of bird numbers.

cumulative 90 percent 2 weeks later, then flattened, and ended in late November.

DISCUSSION

Spring Migration. The spring migration season was later and shorter in 1972 than in 1971 or 1973. In 1972 the first 2 weeks of March were marked by unusually frequent storms that included high winds, snow, fog, and low temperatures. Vegetation was retarded and resident birds came later than usual. Between March 1 and March 17, 1972, I observed several large flocks of blackbirds, mostly redwings, flying out from the direction of the United States mainland at various times of the day, circling north, east, or south before disappearing. As none of these seemed to be associated with any nearby islands, and as they were not seen at the hours chosen for sampling, their counts are not included in this report. Late spring and late onset of migration to areas of territories did not result in appreciable delay in completion of the spring movement. Migration to South Bass Island was observed first in 1971, 1972, and 1973 on March 1,

17, and 3, respectively. Each year spring movements ended in May on 23, 12, and 5, respectively, the period being 76, 56, and 63 days, an average of 65 days.

Maxwell and Putnam (1972), working with grackles on South Bass Island, reported the nesting season from late May into July; and Dolbeer (1974) found redwings nesting during the same periods in nearby Erie County, Ohio. Inter-island flights thus appeared to be absent or minimal during the reproductive period.

In the middle northern latitudes, spring migration is associated with birds' movements north, but many field workers record observations of southern movements as well. My experience was the same—while I regularly saw northern flights in spring, I also saw blackbirds flying south. The combined results for the 3 years of observations show that about half as many birds flew south as flew north at my observation times and places. Some of the southbound flocks could be ascribed to blackbirds flying between familiar roosting and feeding places, assuming that some individuals remain in this area for a time without continuing directly

north. Such irregular flights, however, cannot explain the apparent net movement of more birds south than north at LK in spring in 1971 and 1973. This is an artifact due to sampling method (restriction of observation times) and weather fluctuation.

Fall Migration. As in spring migration, blackbird movements from July through November were not one-directional. Flights to and from South Bass Island began in late July or early August at about the times banders working on the Island first began to capture young-of-the-year redwings and grackles in their baited traps (personal observation). This suggests that foraging flights extending to nearby islands may begin as soon as the young are capable of sustained flight and adults are not occupied on territories. Occurrence of north and south flights at the same observation periods indicates that these are random-direction foraging or roosting flights, rather than seasonal migrations in the usual sense of the term. Large southern flights in fall, including many thousands of birds, usually occurred in October and November, were very high, and extended through the forenoon. Some flocks descended and rested on the Island, but many continued south at great altitudes.

As in spring, data on late-summer and fall blackbird movements are most complete for 1971 and most closely approximate the combined 3-year data shown in figures 4 and 5. The figures show northern flights predominant early in the season and the heaviest southern flights are in October and November. This suggests that Canada may provide late-summer and early-fall feeding places for blackbirds nesting in northern Ohio. Certainly the Bass Islands do not provide enough grain for the breeding populations of redwings and grackles with their young. Thus, the autumn migration period appears to include both long-distance south flights and local movements.

Major Changes in Migration During 1971-1973. Since South Bass Island has no grain fields, few wandering blackbirds come here to feed—they come apparently to nest or to roost. Neither casual observations nor banding records showed

any important changes in the breeding population of redwings or grackles on South Bass Island during the 3 years of this study. Since the local population appeared to be essentially stable, one must conclude that the big changes in my recorded observations (beginning in 1972) involved mainly blackbirds migrating across Lake Erie between the United States and Canada.

The archipelago has long been recognized as an important migration route for many species of birds (Taverner and Swales 1907-1908). According to Jones (1909-1910), Richard (1968), and my own field notes, this migration route follows two courses between the United States mainland and Pelee Island and thence to the Canadian mainland. One branch of the route extends from Catawba Point and Sandusky Bay across the Bass Islands and on to Pelee Island. The other branch extends from Marblehead Peninsula across Kelleys and Middle Islands to Pelee Island. From Pelee Island, the short route to Canada is to Point Pelee, Ontario. The birds I observed in flight during my scheduled observations were all following the first-mentioned branch, flying to or from Catawba Point or Sandusky Bay across the Bass Islands. The abandonment of the cedar roost and the reduced numbers of birds observed in flight were probably due to changes in migration routes. There were no observable changes in the roost environment to suggest that the roost itself had become unattractive to blackbirds. The blackbirds, formerly migrating by way of the Bass Islands, probably changed their route in 1972 to the Marblehead route or elsewhere. This explanation is more logical than that the change was due to any change in the continental or island populations.

A possible explanation for a change in route would be the change in water level in Lake Erie at about the same time (U.S. Dept. Commerce Rep. 1971-73). In 1972 and 1973, the water level in the Lake was at an all-time high, altering the shores, marshes, and surrounding cultivated areas. Many reefs disappeared, small islands and rocks were noticeably smaller and lower in the water, and the contours of large islands were

greatly altered in some cases. All these effects were magnified during severe storms in spring and fall (personal observation).

Conditions on the south shore of Lake Erie, Sandusky Bay, and nearby islands were altered to such an extent that they may have influenced the gregarious behavior of migrating flocks of redwings and grackles. Somewhere south of Lake Erie new social groups may have been formed in 1972 that would include blackbirds from both eastern and western branches of the trans-lake migration route. If most birds migrated traditionally by the eastern route as Jones (1909-1910) estimated, then those from the Bass Islands' route would have joined them, and only the nesting population would come to South Bass Island. Albers (1966) found strong evidence for social organization and epidiectic display being crucial in red-winged blackbird flocking behavior. Large flocks of gregarious birds are known to consolidate with even larger flocks, apparently through social stimulus alone.

Though blackbird roosting on South Bass Island was greatly reduced from the time when the cedar roost was abandoned in 1972, it did not stop wholly. Territorial and juvenile birds apparently were joined by some transients, though fewer than before, and many roosted in other places on the Island. The use of various types of vegetation for roosting (cattail marshes, cedars, deciduous trees, upland grasses) illustrates the flexibility of black-

bird roosting behavior. This corresponds to redwings' and grackles' flexibility in choices of food and nesting sites.

Acknowledgments. I thank John Seubert, Melvin Dyer, and Richard Dolbeer, all of the U.S. Fish and Wildlife Service, for their assistance in organizing and executing this study. Special thanks are due to Clive Petrovic formerly in Dept. of Zoology, Ohio State University, for assisting in observations during 1971, and Mrs. Marion Ladderach who assisted with the figures, and the Franz Theodore Stone Laboratory for provision of office facilities.

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