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# BLACKBIRD-STARLING WINTER ROOST SURVEY IN KENTUCKY AND TENNESSEE, 1977-78

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The existence of large winter blackbird-starling roosts has, at least in recent years, presented problems to residents of Kentucky and Tennessee. Farmers in the vicinity of large roosts have reported serious crop and feedlot losses (including transmission of livestock diseases caused by blackbirds and starlings). Aesthetic, human health, and nuisance problems are frequently associated with large roosts. To gain knowledge and understanding of the distribution and ecology of winter roosts so that more effective means of alleviating these problems can be found, the Fish and Wildlife Service periodically conducts roost surveys throughout the United States. Surveys of winter roosts, with varying degrees of intensity, were conducted during the winters of 1960-61 through 1963-64, 1969-70, 1974-75, and 1976-77 (Meanley and Webb 1965, Webb and Royall 1970, Meanley and Royall 1976, Royall unpublished data).

With the aid of U.S. Fish and Wildlife Service personnel, L.S. Clark, C.R. Cooper, D.E. Steffen, K.M. Garner, R.M. Fisher, J. Karrenbrock, and C.E. Knittle, a roost survey was conducted during the winter of 1977-78, from late December through January in Kentucky and late December through mid-February in Tennessee. Special thanks go to W.C. Royall, Jr., for supplying past winter roost information and helping to revise past roost survey guidelines. Thanks also go to the many cooperators, too numerous to name, who supplied information for the survey. A more detailed report outlining survey guidelines and specific information on each roost surveyed is available from the author.

## METHODS

Information on the locations of winter roosts was mostly obtained from State agencies and their county-level representatives through responses to a request for information sent to each county-level cooperator in December. Kentucky cooperators included all county extension agents, conservation officers, and county Farm Bureau Federation presidents. Tennessee cooperators included all county extension leaders and wildlife officers. Additional inquiries in both states were sent to all Audubon Christmas Count compilers. A number of requests were also made through the media.

All reports of roosts returned by cooperators were screened for accuracy and authenticated locations were investigated by Fish and Wildlife Service personnel. The number of birds in each roost was estimated by the investigator, either when the birds left the roost in early morning or when they returned to the roost in late afternoon. Species composition of the roosting population was usually not recorded because of lack of time and manpower.

Several photographic training aids were examined to help roost investigators improve their estimates of bird numbers. A series of 25 color slides (Kodak Ektachrome 200) were taken of a wide size range (29 to 3300 birds per slide) of blackbird flocks entering and leaving winter roosts. These slides were projected on paper, and the birds counted. Screen projections were then shown to a group of nine experienced Fish and Wildlife Service roost investigators, each of whom reviewed each slide for 10 seconds and recorded his estimate of bird numbers. Slides were shown in groups of five, and estimates were immediately compared with actual bird numbers so that observers could determine their accuracy. Utilization of super 8-mm and 16-mm movie film of flightlines was also investigated with hopes of counting birds on the film and using the film for training.

## RESULTS AND DISCUSSION

### Photographic Training Aids

After several short practice sessions of estimating bird numbers from precounted color slides, most observers felt that this type of training was useful in increasing their

estimating abilities in the field. Movie film of bird flightlines showed some promise as a training aid. The clarity of 16-mm film was much better than super 8-mm and made definition and counting of individual birds easier. It was necessary to film flightlines from a close vantage point (25 to 75 m), or birds could not be accurately counted on the film. When projecting the film for viewing, however, the motion of the birds on the screen was fast and not of much value for training. To correct this, flightlines were filmed at a high camera speed (64 frames per sec), which slowed down the motion when the film was projected. However, counting birds on the film was a time-consuming process and could not be adequately performed without a special frame-by-frame projector. Because we did not have access to the proper projector, a precounted movie film of bird flightlines was not completed.

#### **Roost Population and Movements**

An estimated 5.4 million birds in 14 roosts were located in Kentucky, and 38.2 million birds in 33 roosts were located in Tennessee. Blackbird-starling populations in Kentucky were substantially lower in 1977-78 compared with the estimated winter population of 20.3 million birds in 1976-77 (Royall unpublished data) and 31.0 million in 1974-75 (Meanley unpublished data). Tennessee populations in 1977-78 were also lower than the 1976-77 estimate of 47.1 million birds (Royall unpublished data) and the 1974-75 estimate of 45.7 million birds (Meanley unpublished data). The level of effort and survey dates of the 1977-78 survey were comparable to those of 1974-75 and 1976-77. The substantial decrease in Kentucky bird numbers compared with previous years was probably due to record snow cover and cold weather pushing wintering birds farther south. Mean temperatures in Kentucky in January 1978 averaged 6.5° C (11.7°F) below the 1941-70 average. Snowfall in January 1978 averaged 58.4 cm (23.0 inches), compared with an average annual snowfall for the entire winter of just 15.2 to 50.8 cm (6 to 20 inches) (Glen Conner, State Climatologist for Kentucky, pers. comm.).

Individual roost populations fluctuated widely during the survey period. The number of birds at six roosts (Russellville, Kentucky; Sardis, Milan, Madison, Cumberland City, and Blountville, Tennessee), that were visited twice between December 20, 1977, and February 2, 1978, fluctuated by 15.9 million birds between visits. This change occurred during the time of year when roosts are generally the most stable. This large change in bird numbers occurred concurrently with a January cold spell and heavy snows. Mean January 1978 temperatures in Tennessee averaged 6.2°C (11.2°F) below the 1941-70 average, and total snowfall for that month averaged more than the state normally receives in an entire winter (Glen Conner, State Climatologist for Kentucky, pers. comm.). The roosts in Russellville, Milan, Cumberland City, and Blountville decreased from several million birds each in December and early January to less than half a million by the end of January. The precipitous decline of the Milan roost from three to five million in mid-January to 50,000 on January 30 (Steve White, pers. comm.) occurred about the same time the Sardis and Jackson roosts formed. The Sardis roost began forming in early January about 40 miles southeast of Milan and approached a size of 6 million birds in mid-February. The Jackson roost, located about 20 miles south of Milan, began building up in January and was estimated at 4.2 million birds on March 3.

Of the 47 roosts investigated, 16 were in the same location as in 1974-75 or 1976-77, and 21 others were within five miles of the previous sites. This high return rate to a previous roost location reinforces the belief that the location of many major roosts can be predicted from past surveys.

#### **Locating Winter Roosts**

To best locate winter roosts over a large area, a number of collaborating agencies and cooperators must be involved. A total of 375 of the 649 (58 %) roost survey questionnaires were returned by cooperators. Kentucky Conservation Officers had the best response level (78 %), due mainly to the interest of the Director of Law Enforcement, Kentucky Department of Fish and Wildlife Resources. Kentucky and Tennessee Agricultural Extension Agents averaged a 74% return rate whereas only 13% of the Kentucky Farm Bureau Federation presidents returned survey forms. Tennessee wildlife officers averaged a 61% response. Responses from amateur ornithologists through local Audubon Society Chapters were only 36%.

Error rates for the collaborating agencies were determined by dividing the total number of errors (roosts reported that were not present, plus roosts not reported that were present) by the number of responses. Nonresponse from a cooperator in a county with a roost was considered an error. Because some roosts do not form until late December or January, information obtained from cooperators in December will always

result in some omitted roosts. Kentucky Conservation Officers and Agricultural Extension Agents had the lowest error rates on returns (5 and 7%, respectively) as did Agricultural Extension Leaders and Wildlife Officers in Tennessee (16 and 21 %, respectively). When comparing counterpart agencies, error rates on Tennessee returns were higher than Kentucky returns; however, so were the number of reported roosts. Common reporting errors included reporting staging areas as roosts, giving incomplete or faulty directions to a roost, mistakenly reporting an old roost as being extant, and sending in a report too late. Even with prior telephone verification of a roost with the cooperators, a personal check of the roost site all too often revealed no birds. However, as frustrating as this roost location procedure might be, the cooperator is a necessary part of any large scale roost survey.

#### RECOMMENDATIONS

- 1 Try to lessen the effects of roost population shifts on roost counts by limiting survey periods to a maximum of three weeks.
- 2 Use two-man survey teams. One person usually cannot adequately estimate the number of birds in large roosts.
- 3 Before the survey, set up short training programs for roost investigators. Precounted 35-mm color slides of bird concentrations can be used to improve an investigator's estimating abilities.
- 4 Establish a reliable network of cooperators to compile presurvey roost information. General news releases to the public get poor responses and frequently result in false information. The best approach is to request information from county-level officials. In Kentucky and Tennessee the best sources are Agricultural Extension Agents and State Conservation or Wildlife Officers.
- 5 Do not tabulate species composition at a roost unless you have experienced observers.

#### SUMMARY

A survey of winter blackbird-starling roosts was conducted in Kentucky and Tennessee from December 1977 through February 1978. An estimated 5.4 million birds in 14 roosts in Kentucky and 38.2 million in 33 roosts in Tennessee represented a substantial decrease from numbers estimated in previous years. The decrease was probably the result of heavy snow cover and colder weather pushing wintering birds farther south. Bird numbers at roosts fluctuated widely and several large roosts formed in southern Tennessee during January, normally a stable period, but weather was more harsh in 1978 than in previous years. Of the 47 roosts investigated, 37 were within five miles of a 1974-75 or 1976-77 winter roost site. Color slides were useful as a training aid in improving a roost investigator's estimating abilities.

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