

## A CENSUS OF THE KIRTLAND'S WARBLER

BY HAROLD MAYFIELD

THE Kirtland's Warbler, *Dendroica kirtlandii*, was discovered on May 13, 1851, when a migrant was taken at Cleveland, Ohio. The first nest was located on July 8, 1903, near Red Oak, Oscoda County, Michigan. Every nest found subsequently has been within 60 miles of the first. In winter, the bird is known only in the Bahama Islands.

We do not know with certainty whether there are more or fewer today than in former years. However, our scanty clues suggest that there may have been a substantially larger population in the 70's, 80's, and 90's of the last century. In that era, collectors in the Bahamas seemed to have little difficulty in gathering specimens on most of the larger islands, but Josselyn Van Tyne and I were unable to find any Kirtland's Warblers on New Providence and Eleuthera, two of the islands formerly most productive, during a five-week stay there in January and February, 1949.

## METHOD

In the case of most species of songbirds the task of counting all the singing males would be formidable. But with Kirtland's Warbler this project seemed feasible because of several favorable circumstances:

1. In the nesting season the bird has never been found outside the pine country of the Lower Peninsula of Michigan.
2. All the nests and summer birds have been found in nearly homogeneous stands of small jack pines, *Pinus banksiana*, between the heights of 5 feet (about 7 years old) and 20 feet (about 20 years old).
3. In the forenoon if the weather is mild (not windy, cold, nor raining hard), the male sings rather steadily at a rate of five to nine songs per minute, with occasional silent periods that rarely last over one-half hour; the song is loud enough to be heard a quarter of a mile away on a quiet day.
4. In Michigan there are many competent observers who know the bird and its habitat.

We started with a region about 90 miles square—from Clare and Gladwin counties on the south to Cheboygan and Presque Isle counties on the north; from Kalkaska and Missaukee counties on the west to Lake Huron on the east. But much of this land—farmland, swamp, and deciduous forest—was ruled out quickly. The promising areas were located by use of the following information:

1. Nesting sites of recent years.
2. Jack pine plantings in the state forests and Huron National Forest between 1925 and 1945.

3. Forest fire records in the state forests and Huron National Forest between 1925 and 1945.

4. Forest-cover maps of the Huron National Forest.

5. Advice from state conservation and forestry men.

As a result of this preparation, we were able to single out 1200 surveyor's sections (square miles) for specific attention. These and nearby areas were apportioned among the cooperators; most people were assigned to areas with which they already had some acquaintance.

In the spring of 1951 each cooperator was sent a map of his assignment and a set of suggestions for counting and for submitting results.

All counts were made in June, 1951.

#### RESULTS OF THE CENSUS

The total count was 432 males. Allowing for all possible sources of error, I believe that the total number of birds, male and female, is almost certainly less than 1000. (So far as we know, the males and females of this species are about equal in numbers.)

The summary by counties follows.

	<i>Males</i>	<i>Townships</i>	<i>Sections</i>
Crawford	142	7	19
Oscoda	103	6	19
Iosco	74	8	20
Montmorency	43	2	11
Presque Isle	34	2	13
Kalkaska	28	1	6
Roscommon	4	1	2
Alcona	4	1	1
	<hr/> 432	<hr/> 28	<hr/> 91

Counties searched systematically without results were Clare, Gladwin, Missaukee, Ogemaw, Otsego, Alpena, and Cheboygan.

In addition, Lawrence Walkinshaw inspected without results several areas of jack pines in four counties farther west, Grand Traverse, Wexford, Manistee, and Lake.

The airline distance from the southernmost to the northernmost bird was 64 miles; from the westernmost to the easternmost, 78 miles. The study showed that this warbler is at present largely a bird of the Au Sable River drainage; the only major exception is the group of birds on the border of Montmorency and Presque Isle counties.

The results in greater detail are filed at the Museum of Zoology, University of Michigan, where they are available for study.

This study has brought to light some facts about the Kirtland's Warbler that were outside the central aim of the census.

*Area.*—Although many people have remarked previously that the bird has not utilized nearly all the seemingly suitable habitat, we have

not appreciated before how large a tract of land with suitable cover is the minimum utilized by nesting birds. From the data supplied thus far, there is only one record of Kirtland's Warblers on tracts of less than 60 acres and there are very few on tracts smaller than 80 acres (that is, if rectangular, one-half mile by one-quarter mile).

I examined one strip of jack pines one and one-half miles long and 150 yards wide, with an abrupt transition to totally unsuitable area at the edges. It contained no Kirtland's although there were many colonies in seemingly identical cover in the same township. My only explanation is that this strip was too narrow.

The large "minimum area" is all the more surprising in view of the fact that the territory of a singing male is only one to four acres, and the male and female rarely leave their own territory during nesting season.

In the sections that contained birds, there was an average of 33 acres of apparently suitable land for each singing male (based on data supplied for 319 males on a total estimated acreage of 10,710). In Oscoda County the colonies I examined averaged one male for each 29 acres of plantings.

*Colonies.*—This study has confirmed that Kirtland's Warblers occur usually in "colonies." An isolated pair is a rarity and usually represents a remnant of a declining colony.

I suggest that "colony" be understood to mean a group of birds nesting near enough to one another that a person (and presumably a bird) in one male's territory can hear the song of at least one other male of the same colony. Frequently, the individual territories are not actually contiguous.

*Minimum size of jack pines.*—This study revealed that Kirtland's will sometimes make use of an area where the trees are quite small. In one locality a fire in 1945 burned more than 4000 acres of large jack pines. In the summer of 1951 several square miles of this burn were covered with a spontaneous growth of jack pines, few of them over three feet and many of them under two feet in height. A sprinkling of pairs and at least one nest were found here. This must have been the first year for the colony, five years after the first trees sprouted. (In a planting the trees usually are two or three years old when put out.)

*Acceptance of red pines.*—One of the most famous attributes of the Kirtland's Warbler has been its supposed insistence on jack pines for nesting habitat. The study brought to light two colonies (one containing 12 males) in almost pure stands of red pines, *Pinus resinosa*. This suggests that the critical requirement is not the species of pine

but the configuration—pine thickets and small clearings. Red pines in natural stands seldom if ever grow closely enough together to form thickets.

*Plantings.*—A few years ago it was considered that Kirtland's Warblers nested only rarely in plantings (presumably because the clearings were insufficient). This year most of the birds found were in thickly-grown row plantings. But investigation may show that the birds reach their maximum density in a natural growth with many thickets and openings.

#### RELIABILITY

The principal possibilities of error in this study are colonies missed and birds missed in colonies discovered. I believe that the total error from both sources combined is less than 25 per cent. This is a guess. And there is also the possibility of offsetting errors from overcounts, particularly in colonies of a half-dozen or more birds.

There remains the remote possibility of nesting Kirtland's Warblers in Wisconsin, the Upper Peninsula of Michigan, and southern Ontario, but field work has not yet produced indisputable records in these areas.

The most important source of error, in my opinion, is the possibility of missing a bird by visiting its territory when it is not singing. However, available information indicates that the male is rarely silent for as much as 30 minutes and that in a colony of 6 or more birds there is rarely a silent period of 5 minutes—in a forenoon in good weather in June.

Participating in this project were 32 cooperators in 13 parties, as follows: C. T. Black; Wilbur Bull, assisted by Mr. and Mrs. E. G. Boyes; Irene F. Jorae; Eugene Kenaga and M. A. Wolf; Harold Mayfield, assisted by Mr. and Mrs. Dale Zimmerman; R. A. MacMullan, assisted by S. DiAngelo, E. M. Harger, and W. L. Palmer; Douglas Middleton, and Mr. and Mrs. Neil Kelley; Dr. Richard E. Olsen, assisted by Dr. Norman Gehringer and Dr. and Mrs. Harold Roehm; Ralph O'Reilly; Josselyn Van Tyne, assisted by Andrew Berger, Irving Burr, Philip S. Humphrey, Clarence J. Messner, Robert W. Storer, and Alexander Wetmore; Lawrence H. Walkinshaw; Harold Wing; Emma Wiseman.

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