

1974 Kirtland's Warbler Nesting Success in Northern Crawford County, Michigan

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During the summer of 1974 we continued studying the nesting success of Kirtland's Warbler (*Dendroica kirtlandii*) in northern Crawford County, Michigan. The regions receiving most of our attention were (1) The Lovells Kirtland's Warbler Management Area, sections 5 and 6, T-28-N, R-1-W, Lovells Township and (2) The Artillery Range, Sections 8, 9, 15, 16 and 17, Grayling Township, Crawford County. We have summarized earlier (Walkinshaw, 1972: 3-9; Walkinshaw and Faust, 1974: 64-75) the results of nesting in these two regions from 1966 through 1973. In addition in 1974 we did some work in the Muskrat Lake region, 1½ miles northeast of Red Oak, Oscoda County, Michigan.

The Lovells Management Area consisted mostly of jack pines set out during the mid-1960's. The Artillery Range in 1974 consisted of two sections. Originally this burn, started by artillery fire on 19 August 1955, covered much of sections 8, 9, 15, 16, 17. A second fire in May, 1967 covered that part of the original burn located in sections 8 and 9 and a little more. The original burn covered 2,307 acres, but with the additional land burned in 1967, the two burns probably cover about 2,500 acres. Some of it did not regenerate well after the second burn. By 1974 the southern part of the Artillery Range had trees that had passed their prime. This is reflected in the total population of singing males noted during the different surveys. In 1961 Fenn Holden found 4 on the entire 2,307 acres. Probably there were nearly 100 singing males on this area in 1966 (LHW). In the southern part (burned 1955), on around 1,500 acres, we found 62 singing male Kirtland's Warblers during the 1971 survey. In succeeding years the counts were as follows: 1972, 53; 1973, 49; 1974, 25. In contrast, on the northern burn we found the following (region burned 1967): 1971, 1 (with his territory partly on the southern burn); 1972, 1 (Ron Hoffman); 1973, 8; 1974, 19 singing males. In this region nearly all identified adult males fledged from nests in the burn one-half to one mile south of here.

Under the sponsorship of the U. S. Fish and Wildlife Service, Division of Wildlife Services, the U. S. Forestry Service, the Michigan Department of Natural Resources, the Michigan Audubon Society and the Pontiac Audubon Society removal of Brown-headed Cowbirds (*Molothrus ater*) from all known Kirtland's Warbler nesting grounds was continued. The results were fantastic.

Much of late May, all of June and July and early August 1974 found one or both of us searching Kirtland's Warbler breeding grounds for marked birds, their nests, for cowbird parasitism and for nesting success.

A summary of the nesting success of Kirtland's Warbler on the Artillery Range for 1972, 1973 and 1974 is given in Table 1, comparing it with nesting success from 1966 through 1971 before cowbird adults were re-

TABLE 1
A SUMMARY OF NESTING SUCCESS OF KIRTLAND'S WARBLER ON THE ARTILLERY RANGE, CRAWFORD COUNTY, MICHIGAN BEFORE AND AFTER COWBIRD REMOVAL WAS CONDUCTED IN SUMMER AND FOR OTHER REGIONS AFTER COWBIRD SUMMER REMOVAL WAS BEGUN

Year	Number of Nests	Nests Successful	Total KW Eggs Observed	Total KW Eggs Hatched	Total KW Young Fledged	Parasitized Nests	Total C Eggs Observed	Total C Eggs Hatched	Total C Young Fledged
A. Artillery Range — No Adult Cowbirds Removed									
1966-71	52	19 (2)	122	57	42 (9)	36	55	24	10
B. Artillery Range — After Adult Cowbirds Were Removed									
1972-73	36	22	160	116	90	2	4	2	0
1974	20	13	84	53	48	2	2	1	1
1972-74	56	35	244	169	138	4	6	3	1
C. Lovells Management Area									
1972-74	42	31 (2)	169	138	116 (7)	1	1	1	0
*D. Pere Cheney and Muskrat Lake									
1972-74	10	9	46	40	39	0	0	0	0
*E. All Regions									
1972-74	108	75 (2)	459	347	293	5	7	4	1

*No nests studied by Craig Orr are listed here.

KW=Kirtland's Warbler; C=Cowbird.

Numbers in parentheses are nests and eggs whose success was uncertain.

moved. It is evident that the extreme population decline of Kirtland's Warbler from the 1973 to the 1974 nesting season did not occur in Michigan. It must have happened during the nine months when they were south of Michigan.

In Table 2 we compare number of eggs per nest during both periods: (1) before adult cowbirds were removed, (2) after cowbirds were removed. We also show the increased number of young reared per nest in the latter period. We have been extremely interested in whether birds survive after they fledge. In Table 3 this evidence is brought out for the Lovells region where it was most successfully documented because of the more open vegetation. We have been trying to save Kirtland's Warbler and if cowbirds had not been removed from the Kirtland's Warbler nesting region, it is evident the bird would be doomed.

During the six-year period 1966-1971 Walkinshaw (1972:5) found only three Kirtland's Warbler nests with 5 eggs, and only 10 nests (all parasitized) with 4 eggs on the Artillery Range. After summer removal of cowbirds began we found the following: 1972, of 19 nests with full complements, 15 had 5 eggs, 4 had 4 eggs; 1973, of 14 nests, 10 had 5 eggs, 4 had 4 eggs; 1974, of 17 nests, 11 had 5 eggs, and 6 had 4 eggs. During 1972-1974 inclusive, on four different areas where cowbirds were removed,

TABLE 2
NUMBER OF KIRTLAND'S WARBLER EGGS PER NEST AND THE
NUMBER OF YOUNG FLEDGED PER NEST SHOWING EFFECT
OF COWBIRD PARASITISM

Years	Region	Number of Nests	Number of KW Eggs in These Nests	Number of KW Eggs Per Nest	Number of KW Young Fledged	Number of KW Young Fledged Per Nest
1966-1971	Artillery Range	52	122	2.34	42 (9)	0.807
1972-1974	Artillery Range	56	244	4.36	138	2.46
1972-1974	Lovells Management Area	42	169	4.02	116	2.76
1972-1974	Pere Cheney and Muskrat Lake	10	46	4.60	39	3.90
1972-1974	All 4 Regions	108	459	4.25	293	2.71

KW=Kirtland's Warbler

Numbers in parentheses are young whose fledging is uncertain.

TABLE 3
SURVIVAL OF FLEDGED KIRTLAND'S WARBLERS
AFTER FLEDGING, LOVELLS MANAGEMENT AREA,
T-28-N, R-1-W, SECTIONS 5, 6 - 1974

Nest Number	Number of Eggs Laid	Young Hatched	Young Fledged	Number Found Later	Comments
2†	5	5	5	3+	Male feeding 34-day-old young, female on 2nd clutch
6†	5	4	4	3+	Male feeding 35-day-old young, female on 2nd clutch
10	5	5	5	3 or more	Male feeding 29-day-old young
11	4	3	0	0	Predator
12	4	3	3	3	Young seen
13	5	5	5	0	Saw 5 young fledge
14	4	4	4	4	Both parents with 4 young near nest, age 15 days
22†	3	2	0	0	Predator took 1 egg; 2 young
23*†	6	5	5	0	Saw young fledge
24†	5	5	5	0	Male feeding 19-day-old young, female on 2nd clutch
32	2+	2+	2+	2	Male feeding 15-day-old young

33	3+	3+	3+	3	Male and Female feeding 15-16 day-old young
38	1-1C	1-1C	0 (2nd brood)	0	Failure due to Cowbird
39	3+	3+	3+	3	Male and Female feeding 15-16 day-old young
40	4	4	4 (2nd brood)	4	Parents with young after fledging
41	3+	3+	3+	3	Parents with 3, possibly 4 young near nest, 15-16 days old
42	5	5	4 (2nd brood)	4	Young observed to fledge; 1 died in nest
43	5	2	2 (2nd nest)	2	3 eggs failed to hatch; 2 young with parents 12-13 days of age
44	4	4	4 (2nd brood)	4	Young observed, 12-13 days of age,
Total	76	68	61	41	

*We did not find the young from nest 23 after we saw them fledge, but there were some dense jack pines in the region and we could have missed them. This pair did nest a second time and reared 4 young in that brood (Nest 42).

†Color-banded birds were noted to rear two broods or to have a second nesting in the following combinations: Nests 6, 44; Nests 2, 38; Nests 22, 43; Nests 23, 42; Nests 24, 40.

we found 100 nests with full complements (5 were parasitized and several were second clutches). One nest had a clutch of 6 eggs; 63 had 5 eggs; and 25 had 4 eggs. The smallest clutch (a parasitized nest) consisted of only one Kirtland's Warbler egg. The average was 4.45 eggs per clutch, and if the five cowbird parasitized nests are subtracted, 4.62 eggs (95 nests with 439 eggs). Compared with 2.11 eggs per clutch in parasitized nests this gives a remarkable increase. Sometimes eggs failed to hatch or nestlings died because of the much larger cowbird which hatched two or three days prior to the warbler.

Egg and nestling losses were given in our earlier paper (1974:67) for the years 1972 and 1973. The following are the 1974 losses.

Artillery Range — Although some eggs hatched in 5 nests, 8 eggs failed to do so. From 6 nests, 23 eggs (all) and 5 young disappeared, presumably taken by some predator. We found a Blue Jay at one nest pecking a large nestling on the head. He died in our hands but his three nestmates scattered in three different directions when we rushed up.

Lovells Management Area — In one nest 4 eggs were deserted. In 4 nests, 6 eggs failed to hatch; 2 eggs and 5 nestlings were taken by predators; one was apparently killed by a cowbird. The young newly hatched KW was found dead on the edge of the nest which contained a two-day old cowbird. Another nestling died on a rainy day.

Muskrat Lake — Three eggs disappeared from one nest (evidently taken by a predator) and the female (8 years old) deserted the other two.

SUMMARY

Cowbird removal has aided the success of Kirtland's Warbler nesting in Michigan but the counts of singing males continue to decline. Indications are that losses may occur during migration or on the wintering grounds.

LITERATURE CITED

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1974 Breeding Success of The Kirtland's Warbler

Craig D. Orr

During the summer of 1974 I studied the breeding success of the Kirtland's Warbler (*Dendroica kirtlandii*) on three main nesting grounds northeast Michigan. These studies supplemented those of Walkinshaw and Faust and helped to ascertain the effectiveness of the Brown-headed Cowbird (*Molothrus ater*) removal program conducted by the U. S. Fish and Wildlife Service.

METHODS

Observations were carried out almost continuously from 20 May, 1974 to 15 August, 1974, between duties as a tour guide on the U. S. Forest Service Volunteer Program. Most nests were found by following a singing male as he took food to the young or female on the nest. Other nests were located by searching an area where an adult had been seen repeatedly and then by flushing the sitting female. Nests were checked almost daily to determine progress. Nests at Muskrat Lake were reported on by Charles Munn. Nestlings were marked with government aluminum bands.

STUDY AREAS

Studies were made in three different parts of Oscoda and Crawford Counties, Michigan. Two areas, including the main study area, were located on U. S. Forest Service land in the Huron National Forest. The third was owned by the state and administered by the Department of Natural Resources.

The state land was located near Muskrat Lake in Oscoda County. Sixteen males were located there during the 1974 census by William Irvin, Jean Skellenger, Joe and Verna Beaver, Judy Alderson, Doris Chaparral, Judy Eldridge, and myself. This was an area of approximately 800 acres accidentally burned 17 April 1964, which has yet to reach its prime. Jack pines (*Pinus banksiana*) were three to six feet tall.

Pere Cheney in Crawford County was a more mature area of jack pines extending over an area of 486 acres burned on 12 May, 1958. We found 21 males there during the 1974 survey.

Mack Lake, with 19 singing males (count from 1974 census), received the most attention in this study. It was an area composed predominantly of planted red pines (*Pinus resinosa*) 21 years of age. All nests were confined to three square mile sections. It was located only two miles east of Mack Lake Campground and contained the largest single colony of Kirtland's Warblers in red pines.

All three areas were covered by blueberries (*Vaccinium spp.*), bearberry (*Arctostaphylos Uva-ursi*), sandcherry (*Prunus pumila*), and sweet fern (*Comptonia peregrina*). Grasses, particularly bluestems (*Andropogon spp.*), were also prevalent.