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Kirtland's Warbler Studies in Michigan
Summary of program for summer 1987

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The U. S. Fish and Wildlife Service's Kirtland's warbler research effort in Michigan involves three major programs. This progress report summarizes our activities during the summer 1987 field season and is intended to inform our colleagues and others interested in our work of our activities and accomplishments. All results are preliminary, and some of our ideas may well be modified as the data are subjected to further analyses. For ease in presentation, the information is divided into the three major programs of the research effort.

1. Banding

A color-banding program with the objective of determining seasonal and annual movements of adult and juvenile Kirtland's warblers in Michigan, their annual survival rates, and the source of birds colonizing the Mack Lake Burn was continued in 1987. A color-banded population will greatly facilitate our understanding of site fidelity and habitat use.

Birds were captured in mist nets for banding. In 1987, we selected 3 study areas from over 20 sites visited. Study sites are at Bald Hill South, the Muskrat Lake Burn, and Mack Lake (sections 21 and 22). We established 134 net lanes and color-banded (3 plastic color bands plus 1 Fish and Wildlife Service numbered band, 2 bands on each leg) 80 formerly unmarked birds (total includes 3 Kirtland's warblers banded with a single Fish and Wildlife Service band as nestlings - see under item 2). Eleven Kirtland's warblers that had been color-banded in previous years were recaptured. The Known Bahama bird (the "Governor") was recaptured for the third consecutive summer.

We attempted to inspect each net at 15 minute intervals to minimize the time birds spent in the net. This schedule was generally adhered to, except when an unusually heavy catch of birds slowed us down. In those cases, the entire net array was inspected for Kirtland's warblers before the other birds were released, and the Kirtland's warblers were recovered first and banded.

Wes Jones and Mike DeCapita reinforced our concern that nets left up and furled overnight might inadvertently capture Kirtland's warblers in loose sections of the net. Indeed, one Kirtland's warbler did fly into a furled net and became entangled just as Jones arrived to open the net. This bird was banded and released unharmed. Subsequently, Paul Sykes designed a system to eliminate this risk to the birds. A 9 inch

wide strip of black roofing felt was secured to the ground between the net poles, and furled nets were dropped down onto the felt strip when the net was not in use. This system was adopted at all nets, and in many thousands of net nights, no birds became entangled. However, two toads were caught and released unharmed.

Nets were operated from July 1, when we attempted to catch banded fledglings, until September 29. Of great interest to us were the large numbers of Kirtland's warblers remaining in their colonies late in September. We captured 29 Kirtland's warblers and saw one other in September, including a late capture on September 29. Therefore, we believe birds may remain on the breeding grounds into October. September birds were generally known breeding adults, showed molt, and were not excessively fat, leading us to believe that they do stay later, or perhaps pick up weight at stop-over points during migration.

The existence of numbers of adult Kirtland's warblers at this late date has implications for public use of the colonies after August 15. We saw rabbit hunters with shotguns and dogs hunting in a Kirtland's warbler territory when the birds were present. Seismic explosions were set off in another warbler's territory within 1 hour of our capturing two Kirtland's warblers less than 100 m away. All terrain vehicles frequently drove through occupied colonies. We suggest that land managers consider extending the date of reopening Kirtland's warbler colonies to the public. Perhaps October 1 (or even October 15) would be more appropriate. The majority of Kirtland's warblers were captured less than 1 m from the ground -- it is easy to imagine a hunter inadvertently hitting a Kirtland's warbler while attempting to shoot a rabbit.

2. Radio-telemetry

Our radio-telemetry study was designed to provide information on the rates and causes of mortality among newly-fledged Kirtland's warblers, determine movements and dispersal from natal areas, examine territory size and home range of adults and juveniles late in the summer, and plot Kirtland's warbler locations as a basis for a quantitative assessment of habitat needs of the species.

- a. Banding nestlings. We had hoped to band nestlings and later capture them for radio tracking at two nests in each of our three study areas. We banded 18 nestlings at 5 nests in the 3 study areas, as follows:

Bald Hill -- Two nests were found at Bald Hill. Together they held nine eggs, all of which hatched. The nine chicks were banded.

Muskrat Lake -- Two nests were found which together contained seven eggs. Six eggs hatched, and all six chicks were banded.

Mack Lake -- Of the first two nests found, one contained three chicks, which were banded. The second contained a cowbird chick, which was removed on June 22 to give the birds a chance to lay a second clutch. A third nest contained four chicks, which were left unbanded.

All Kirtland's warbler chicks apparently fledged from their nests. Three of them were later captured in mist nets and given color bands, and two were radio-tagged.

- b. Radio-telemetry. Recaptured fledglings were all under 12 grams and undergoing extensive feather growth on their bodies, wings, and tails. Because of this, we decided to defer attaching radios to these birds. We thus waited until after July 15 before attaching any radios to Kirtland's warblers. Between July 15 and August 25, we radio-tagged a total of 16 Kirtland's warblers (3 adults and 13 hatching year birds, including 2 banded as nestlings). Radios remained in place up to 25 days and signals were detected up to 3 km for up to 32 days. We made 159 radio-detections in 1987. One hatching-year bird radio-tagged on August 5 was found dead the next day; it had been taken by an avian predator. Ten birds remained within the colony in which they were caught; signals were lost from the remaining five birds, and they were not detected during searches in other colonies.

Preliminary analysis of the radio location data revealed a highly variable pattern of home-range use, with some birds remaining within a very small area, while others ranged through three sections within their natal colonies.

3. Habitat utilization

False infrared aerial photographs at a scale of 1:6000 were taken of all active and numerous potential Kirtland's warbler colony sites. We especially wish to thank Jerry Weinrich (Michigan Department of Natural Resources) and John Probst (Forest Service) for suggesting areas that needed coverage. We have received 602 photographs; resolution is excellent, and they can be enlarged 10-fold without loss of clarity, providing a scale of 1"=50'. When we have the complete set catalogued, we will be able to request specific prints from Abrams Aerial Survey Corporation (Lansing, Michigan) for about \$5.50/print. We will bring the photographs to Michigan in 1988 so those wishing to review them before ordering may do so. Anyone wishing specific prints should contact us directly, rather than Abrams. The aerial photos will provide an excellent base for evaluating habitat use, territory size, and home range in various Kirtland's warbler habitats in Michigan.

While we were in Michigan in 1987, we benefited tremendously from the help and advice of numerous people. We especially thank Len Schumann and Mike DeCapita for the loan of a Fish and Wildlife Service vehicle, three portable radios, and storage shed space; Mike DeCapita, Ron Refsnider, Wes Jones, Larry Hood, Carol Bocetti, Toni Ruth, Elaine Carlson, John Probst, Larry Walkinshaw, Gray Pendleton, and Doug Munson for help in the field; Jerry Weinrich, John Byelich and members of the Kirtland's Warblers Recovery Team, Larry Walkinshaw, Gray Pendleton, and Steve Fritts for many helpful suggestions, and Duane Brooks and his staff (especially Mae) for hosting us at the Department of Natural Resources field office in Grayling. The study would have been much more difficult, less interesting, and less productive without their help and support.