



Confirmed Occurrence and
Nesting of the Kirtland's Warbler
at CFB Petawawa, Ontario
A First for Canada

Tammy Richard



Figure 1: Male Kirtland's Warbler detected
6 June 2006, CFB Petawawa.

Photo: DND/ORMG (Tammy Richard)

Introduction

The Kirtland's Warbler (*Dendroica kirtlandii*) is an endangered bird species in Canada and the United States. It was considered to be one of the rarest birds in North America (Mayfield 1992). In 1951, the Kirtland's Warbler population in Michigan, its only then-known breeding area, was estimated at 1000

individuals (Mayfield 1953), however, by 1974 the population had decreased to 167 singing males (Byelich *et al.* 1985). Until recently, the only confirmed breeding grounds of the Kirtland's Warbler were in Michigan, USA (Aird and Pope 1987, Walkinshaw 1987, Probst 1991, Mayfield 1992, James 1999).

Canadian Forces Base Petawawa (CFB Petawawa), near Petawawa, Ontario, contracted a Kirtland's Warbler survey in 2006 as part of a larger Species at Risk study on Department of National Defence (DND) lands. Historically, the Kirtland's Warbler was found in the Petawawa area. Harrington (1939) noted that they were "not uncommon" to the jack pines (*Pinus banksiana*) of Petawawa. Kirtland's Warblers may have nested in the Petawawa area in the 1800s and early 1900s (Harrington 1939, James 1999). Singing males were heard at CFB Petawawa in 1916, 1939 (Harrington 1939) and 1946 (Hibbard and Aird 1978). More recently, a lone singing male was detected on CFB Petawawa property in 1977 and 1978, but nesting was not detected (Aird 1977, Cadman *et al.* 1987, Hibbard and Aird 1978). Although CFB Petawawa property was surveyed in 2002, 2004 and 2005, the Kirtland's Warbler was not detected. Walkinshaw (1939) and James (1999) predicted that Kirtland's Warblers would begin to breed in Ontario as the population in Michigan increased.

The first record of a breeding pair of

Kirtland's Warblers in Ontario occurred near Midhurst, Ontario in 1945 (Speirs 1984). The pair and a fledgling were observed in a mixed deciduous woodlot in Barrie, Ontario, between 8 and 31 August 1945 (Speirs 1984). The birds were observed and heard during this time, however a nest was not found.

Although there had been no recent breeding records of the Kirtland's Warbler in Canada, males have been detected in suitable habitat in Ontario on several occasions (Aird and Pope 1987, Bickerton *et al.* 2006). The purpose of this paper is to document the first occurrence of Kirtland's Warbler on CFB Petawawa property in 28 years and the first Kirtland's Warbler nest detected in Ontario and Canada.

Observations

In June 2006, CFB Petawawa implemented a Kirtland's Warbler presence or absence survey on the active military training facility. A Geographic Information System (GIS) analysis was performed on Forest Resource Inventory (FRI) data to target young jack pine stands for the survey. Initially, forest stands were chosen based on descriptions of Kirtland's Warbler habitat in Michigan: stands with at least 80% jack pine, between 8 and 20 years old, and trees ranging between 1.5 m and 5 m in height. A broadcast calling survey was performed at suitable survey sites.

On 6 June 2006, the first morning of the survey, Tammy Richard and Dr. Paul Aird detected a male Kirtland's Warbler

singing in a young jack pine stand at one of the survey sites at 1050 hrs. This was the first Kirtland's Warbler detected on CFB Petawawa in 28 years. The surveyors observed the male, confirmed its identity, obtained photographs (Figure 1) and recorded its song. This bird was observed only until 7 June 2006, after which weather and access to the area hindered the surveyors' ability to detect the bird again during the summer. The male was found in a jack pine-red pine (*Pinus resinosa*) stand approximately 11 years old, according to FRI data, with trees between 1.5 and 4 m tall.

On 7 June 2006, the calling survey continued with Richard, Dr. Aird and Nancy Hiscock. A second male Kirtland's Warbler was detected in a young jack pine stand, approximately 16 km away from the bird detected the day earlier. The male was observed and photographed (Figure 2) and its song was recorded. The bird was monitored from the day of detection until 7 July 2006, where it was found consistently singing on territory throughout the monitoring period. On 6 July 2006, the Kirtland's Warbler was banded with coloured leg bands after it was captured in a mist net by luring with a broadcast call. It was considered to be an After Second Year (ASY) bird of suitable weight (15.4 g). The male occupied either three small territories in close proximity to each other, approximately 1.4 hectares, 2 hectares, and 3 hectares in size, or one large territory 39 hectares in size. The territory consisted of 5 year old to 8 year

Figure 2: Male Kirtland's Warbler detected 7 June 2006, CFB Petawawa.
Photo: DND/Daryl Coulson





Figure 3: Banded Male Kirtland's Warbler detected 13 May 2007, CFB Petawawa.

Photo: DND/Tammy Richard

old jack pine, 1.5 m to 4 m tall, interspersed with openings containing low sweet blueberry (*Vaccinium angustifolium*), velvet-leaf blueberry (*Vaccinium myrtilloides*), sweet fern (*Comptonia peregrina*), lichens (*Cladonia* spp.), and mosses (*Ceratodon purpureus* and *Polytrichum juniperinum*).

The survey continued, and on 13 June 2006, Richard and Hiscock heard another male Kirtland's Warbler singing in suitable jack pine habitat. However, this male was not observed or photographed, nor was it detected again during the summer.

The Kirtland's Warbler survey on CFB Petawawa continued in May and June of 2007. On the second day of the survey, 13 May 2007, Richard and His-

cock heard a male Kirtland's Warbler singing at one of the survey sites. Further inspection revealed that it was the male that was banded in 2006 (Figure 3), who returned to the same territory. It occupied a territory of approximately 7 hectares consisting of approximately 8 year old jack pine, 2 m to 4 m tall, interspersed with openings of blueberry, lichens and mosses. This Kirtland's Warbler was monitored frequently over the next 9 weeks, until it was no longer heard after 17 July 2007. The male called emphatically throughout the monitoring period. Observers did not note the presence of a female at any time during the monitoring period.

Figure 4: SY Male Kirtland's Warbler captured 28 June 2007, CFB Petawawa.

Photo: DND/ORMG (Nancy Hiscock)

While in suitable habitat on 18 June 2007, Richard heard another male Kirtland's Warbler singing at 1000 hrs approximately 300 m away from her location.

The song was investigated and an unbanded male Kirtland's Warbler was detected in a young jack pine-red pine stand that previously had been surveyed. The male was observed calling and pumping its tail in a jack pine. The bird was monitored closely in the days

that followed for evidence of a female. The male was observed carrying food on 20 June 2007, and a search for a nest ensued; however, a nest was not found. The male frequently called from several older jack pine trees above the canopy height (5 m to 6 m tall). On 28 June 2007, at 0930 hrs, the male Kirtland's Warbler was banded, which revealed that he was a Second Year (SY) bird weighing 14.9 g (Figure 4).





Figure 5: Female Kirtland's Warbler captured 28 June 2007, CFB Petawawa.

Photo: DND/Tammy Richard

The events that followed lead to a historical moment in breeding bird history in Ontario. While banding the male, a SY female Kirtland's Warbler was captured incidentally in the mist net (Figure 5). The female was dull gray in plumage with heavy speckling on her breast, weighed 14.5 g, and most importantly, had a brood patch. She was banded and successfully released. The search for a nest was initiated by Tammy Richard, Nancy Hiscock and David Okines, by observing the pair. At 1930 hrs on 28 June 2007, the first Kirtland's Warbler nest in Ontario was detected under the low branches of a jack pine tree (Figure 6).

Figure 6: Kirtland's Warbler nest detected 28 June 2007 at CFB Petawawa.

Photo: DND/Tammy Richard







Figure 7: Kirtland's Warbler hatchlings detected 28 June 2007 at CFB Petawawa. Photo: DND/ORMG (Nancy Hiscock)

The nest contained two Kirtland's Warbler hatchlings and two unhatched Kirtland's Warbler eggs. The hatchlings possessed grey down and their flight feathers were just starting to break the pin (Figure 7). The inside of both hatchlings' mouths was bright pink and the gape flanges were light yellow in colour. The hatchlings were estimated to be 6 days old. Based on their age it was estimated that the young hatched on 22 June 2007. Brown-headed Cowbird (*Molothrus ater*) eggs or young were not present. The young were banded and returned to the nest. The two unhatched eggs were elliptical and cream coloured with brown speckling



Figure 8: Kirtland's Warbler egg. Photo: DND/Tammy Richard

throughout, however more concentrated at the larger end of the egg (Figure 8). The eggs measured 18.8 mm x 14.4 mm and 18.4 mm x 14.2 mm, respectively. They were later collected and sent to the Royal Ontario Museum for genetic analysis, which revealed they were in fact Kirtland's Warbler eggs (ROM #506960).

The nest was located in an 11 year old natural jack pine-red pine stand, on sandy soil, with jack pine trees ranging between 2 m to 4 m tall. The nest was found in an 820 m² clearing, which sloped to the south, and contained low sweet blueberry, velvet blueberry, sweet fern, grasses (*Andropogon* spp.), sedges (*Carex* spp.), lichens and mosses (Figure 9). Four jack pine trees were located approximately central in the clearing. The nest was below a 3.5 m tall jack pine at the end of the row, 81 cm below a branch of the jack pine and 2.1 m from the

base of the tree (Figure 10). The nest was on the southwest side of a small hummock under the young jack pine, very well concealed by blueberry and grasses, much like that described by Probst (1991). Other birds frequently heard or observed in the general area of the nest included: White-throated Sparrow (*Zonotrichia albicollis*), Hermit Thrush (*Catharus guttatus*) and Nashville Warbler (*Vermivora ruficapilla*). No Brown-headed Cowbirds were detected in the nesting habitat or other Kirtland's Warbler habitat during the two survey seasons.

Figure 9: General nest clearing location at CFB Petawawa 2007. Photo: DND/ORMG (Nancy Hiscock)







Figure 10: Kirtland's Warbler nest location at CFB Petawawa 2007. Photo: DND/Tammy Richard

Following the banding of the hatchlings, the female was observed entering the nest with food, and the male sang from a branch over the nest. The pair of Kirtland's Warblers was monitored daily, from a distance, between 28 June and 2 July, revealing that the female continued to feed the young in the nest. The female, carrying food, would land in the jack pine tree above the nest, pump her tail, work her way down the branches, and then quickly fly into the nest, remaining in the nest no longer than 10 seconds. During this time, the male continued to sing while perched in tall trees around the nest site, and was observed carrying food on several occasions. During these observer visits, the male either called or exhibited the alarm chip while the female chipped. The pair remained in close proximity to the nest (within 10 m radius).

On the morning of 2 July 2007, the male and female were heard and observed chipping excitedly near the nest and "peeping" sounds were heard. Although no young were observed outside of the nest, given the distance of observers (Tammy Richard, Paul Aird and Daryl Coulson), it was assumed that the young had fledged the nest. Video analysis later confirmed this, as a fledgling was visible moving outside of the nest.

The adults and fledglings were monitored regularly in the following days. Throughout the duration of nesting period, the pair occupied a territory of approximately 1.27 hectares. After the fledging date, the pair and young dispersed and no longer remained at the immediate nest location. On 10 July 2007, the last observations of the pair and fledglings were recorded. The male was heard calling, the female was chipping, and peeping sounds were heard in the dense jack pines just west of the nest. Although the fledglings were not observed, they were presumably with the parents at the site. Although additional jack pine stands on CFB Petawawa were searched, this was the only pair and nest that was detected. The male was last detected in the area on 13 July 2007, despite several visits to the area later in July.

Discussion

The Kirtland's Warbler has successfully bred on CFB Petawawa property, providing evidence of the first breeding record of this endangered species in Ontario in 62 years. It has also provided physical evidence of the first Kirtland's Warbler nest and eggs in Canada. Given the suitable habitat and the documented return of at least one Kirtland's Warbler to the property, it is possible that additional Kirtland's Warblers will breed on military land. This documentation also provides evidence of a range expansion of the Kirtland's War-

bler population in North America. Additional surveying and monitoring will contribute to further knowledge and detection of breeding Kirtland's Warblers in Canada.

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Literature Cited

- Aird, P.** 1977. Rare bird found in Ontario. Faculty of Forestry and Landscape Architecture, University of Toronto, Ontario. pp.29-30
- Aird, P.** and **D. Pope.** 1987. Kirtland's Warbler. In: Atlas of the Breeding Birds of Ontario (M.D. Cadman, P.F.J. Eagles and F.M. Helleiner, Eds.). University of Waterloo Press, Ontario. pp. 388-389.
- Bickerton, H.J., K. Tuininga, D. Coulson** and **P. Aird.** 2006. Recovery Strategy for the Kirtland's Warbler (*Dendroica kirtlandii*) in Canada (Proposed). Species at Risk recovery strategies. Environment Canada, Ottawa, Ontario. 23 pp.
- Byelich, J., G. Irvine, N. Johnson** and **H. Mayfield.** 1985. Kirtland's Warbler Recovery Plan. Kirtland's Warbler Recovery Team, Michigan. 40 pp. + Appendices.

- Cadman, M., P. Eagles and F. M. Helleiner.** 1987. Atlas of the Breeding Birds of Ontario (1981-1985). Federation of Ontario Naturalists and Long Point Bird Observatory, University of Waterloo Press, Ontario. 611 pp.
- Harrington, P.** 1939. Kirtland's Warbler in Ontario. Jack Pine Warbler 17:96-97.
- Hibbard, S. and P. Aird.** 1978. Records of the Kirtland's Warbler in Canada (Draft). University of Toronto, Toronto. 2 pp.
- James, R.** 1999. Update status report on the Kirtland's Warbler *Dendroica kirtlandii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ontario. 10 pp.
- Mayfield, H.F.** 1953. A census of the Kirtland's Warbler. Auk 79:173-182.
- Mayfield, H.F.** 1992. Kirtland's Warbler. In: The Birds of North America, No 19 (A. Poole, P. Stettenheim and F. Gill, Eds.). The Academy of Natural Sciences, Philadelphia, Pennsylvania., and American Ornithologists' Union, Washington, D.C.
- Probst, J. R.** 1991. Kirtland's Warbler. In: The Atlas of Breeding Birds of Michigan (R. Brewer, G. McPeck and R. Adams Jr., Eds.), Michigan State University Press, East Lansing, Michigan, USA. pp. 414-417.
- Speirs, D. H.** 1984. The first breeding record of Kirtland's Warbler in Ontario. Ontario Birds 2:80- 84.
- Walkinshaw, L.H.** 1939. Kirtland's Warbler or the Jack-Pine Warbler. Jack-Pine Warbler 17:87- 97.
- Walkinshaw, L.H.** 1987. Kirtland's Warbler: the natural history of an endangered species. Cranbrook Institute of Science, Michigan. 207 pp.

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