

# Reflections on searching for and finding Kirtland's Warbler in Ontario and Québec, 1976-2016

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Photo: Daryl Coulson,  
Ontario Ministry of  
Natural Resources and Forestry

## Introduction

The Kirtland's Warbler (*Setophaga kirtlandii*, formerly *Dendroica kirtlandii*), has been known during the past century as a species that lived in jack pine (*Pinus banksiana*) forests in Michigan, wintered in the Bahamas and nearby islands, was seen occasionally in migration, and existed in such low numbers that it was among the world's most endangered species (Bocetti *et al.* 2014).

While working as a forest scientist with the Canadian International Paper Company and the Pulp and Paper

Research Institute of Canada in Québec during the 1970s, I was invited to speak to audiences about my research related to the growing and harvesting of forests (especially jack pine, the presumed major habitat of Kirtland's Warbler).

I inserted into these talks the fact that jack pine cones are coated with a resin that is melted by the heat rising from a ground fire to release the seeds from the cones high up in the trees. The trees are killed by the fire, but the rain of falling seeds immediately after the fire creates the

next crop of trees. This simultaneous seed fall explains why the trees in jack pine forests are even-aged, and traditionally clear-cut rather than selectively cut. However, it is a myth that only fire can open and release the seeds. The direct heat from the sun and reflected heat from the ground can provide enough heat to open cones growing close to the ground.

This article is an account of the research and field searches that led to finding the endangered Kirtland's Warbler living in Ontario and Québec. First, I present some background on my historical interest in the welfare of endangered species.

### **Endangered Species**

In 1974, I joined the Faculty of Forestry at the University of Toronto to teach and conduct research on forest conservation policy. I began by writing and presenting a research paper titled *Canada's changing policy of creating nature reserves* at a meeting of the United Nations Food and Agriculture Organization in Switzerland in 1975. The paper concluded that people can decimate the plant and animal population of a region in less than one human generation.

I wrote that "since we are changing habitats faster now than ever before, more attention should be directed to the preservation of Canada's rare or endangered species and their habitats" (Aird 1975). Based on this research, I presented a brief to the Ontario Provincial Parks Council in 1977 on The Status of Ontario's Biological Base. The Council submitted my brief directly to the Ontario Minister of Natural Resources with the following comments:

"Council heartily endorses Paul Aird's brief. In fact, the motions passed at our

Niagara meeting give credence to our concern for these matters. We would appreciate it Mr. Minister, if you would consider Prof. Aird's brief as a preamble or introduction to our motions dealing with the need for a subcommittee on Nature Reserves and the need to establish a quasi-public body to stimulate, coordinate and oversee the protection of Ontario's biological base."

### **Chronology in Ontario**

At that time, I was aware of the occasional sighting of Kirtland's Warblers in Ontario. In 1975-76, Susan (Hibbard) Greenwood and I prepared a chronological history of Ontario sightings of the Kirtland's Warbler. It began with a known record of 12 sightings that eventually expanded, through our research, to a list of 27 sightings. Most of the new listings had not been reported in the literature and required considerable effort to locate and trace to the original source for authentication. These data were an extremely valuable record of where the species had been seen in Ontario and were matched with sighting records in the United States to indicate possible flight routes. These sightings included ones during migration.

This chronological record was periodically updated to 2007, the last version with the assistance of Ken Tuininga, Canadian Wildlife Service, Environment Canada. The record is now listed in COSEWIC (2008) as *Appendix 1*.

### **My Kirtland's Warbler Hypothesis**

Despite the fact that the Kirtland's Warbler was known to nest only in Michigan and had not been seen in Ontario since

1961, the results of the chronological research noted above led to my development of an hypothesis about Kirtland's Warbler dispersal. Based on the fact that research on the Kirtland's Warbler in Michigan had established that nesting areas were seldom found in jack pine stands older than 15 years, my hypothesis was:

*Since Kirtland's Warbler nesting habitat becomes unsuitable within about 15 years, the ability of the Kirtland's Warbler to establish new nesting grounds beyond existing nesting grounds must be inherent in the individuals making up the species and essential to their continuing survival.*

This hypothesis, formulated in 1977, contradicted the fact that as the Kirtland's Warbler population diminished, its breeding range also diminished; by 1977, the number of counties occupied by the species in Michigan had fallen from 13 to six. From 1951 to 1971, the population diminished by about one-half (Figure 1).

However, if my hypothesis was true, the dispersal of the Kirtland's Warbler beyond the Michigan centre would continue, irrespective of the size of the population.

### **My 1977 Petawawa Searches and Success**

In 1977, I decided to begin searching for the Kirtland's Warbler in Ontario. While working in Québec, I had occasionally visited what was then called the Petawawa Forest Experiment Station beside the army base. I had noted the young stands of jack pine on the Petawawa plains, which were kept young by fires accidentally set during war training exercises on the army base. This personal knowledge of the jack pine forest in Petawawa, coupled with my knowledge of Paul Harrington's findings of the Kirtland's Warbler, led me to select the Petawawa plains as the first place to search in Ontario.

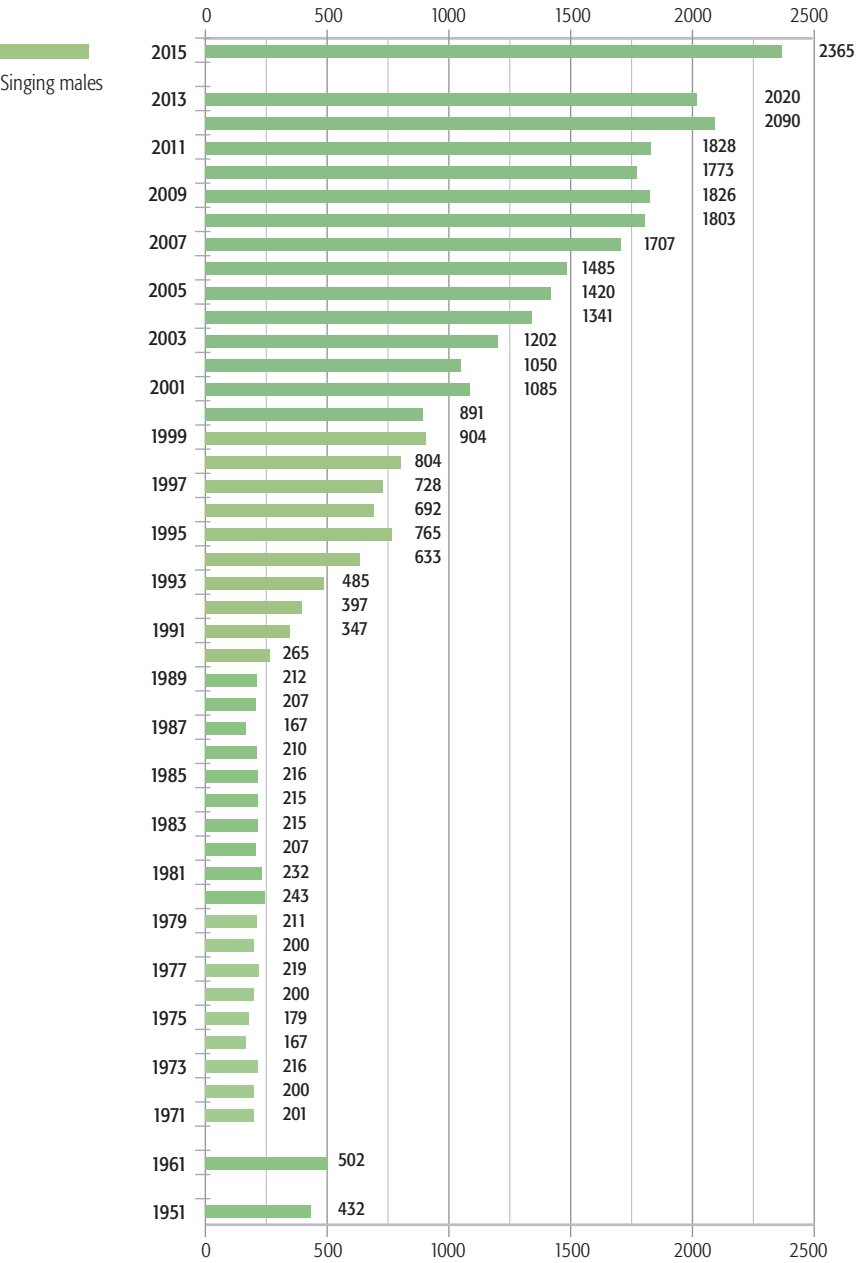
I wrote to General Jacques Dextrase, Chief of the Defense Staff, who at an early

### **Early Ontario Sightings**

As an interesting aside, the first record of a Kirtland's Warbler sighted in Canada was in 1900, when a bird was shot on Toronto Island by J. H. Samuel. This specimen was collected three years before the species was known to breed in Michigan. The mounted specimen was sold to John Lewis Childs of Floral Park, New York, then to Arthur T. Wayne of Charleston, South Carolina, then to J.E. Keays of London, Ontario, and then to W.R. Campbell of Lobo, Ontario. In 1922, the Royal Ontario Museum bought the Campbell collection, including this bird. This sighting was well south of the southern limit of the jack pine's range in Ontario.

Between 1901 and 1946, there were only four sightings of Kirtland's Warblers in Ontario. All of these sightings were by Paul Harrington in 1916, 1939 and 1946 at Canadian Forces Base (CFB) Petawawa. Paul Harrington and F.A. Starr were dentists in the armed forces who studied the local birds on weekends. Harrington reported that Kirtland's Warblers were "not uncommon" on the Petawawa sand plains in 1916. Harrington returned to search for the warblers in 1939. After searching for three days without success, he sat beneath a jack pine tree and a Kirtland's Warbler landed on his boot. These birds are very tame; they show no fear of humans. Harrington returned to the Petawawa plains twice in 1946 and saw the warblers each time (Harrington 1939).

Figure 1. Kirtland's Warbler singing male census results: 1951-2015.  
Census areas include Michigan, Wisconsin and Ontario. *Source: USFWS (2018a)*



stage of his illustrious career had been Woodlands Manager for the Singer Sewing Machine Cabinet Plant in Thurso, Québec, on the Ottawa River. I wrote that I had worked for Canadian International Paper Company in Grenville, Québec, and Hawkesbury, Ontario, which were on the Ottawa River downstream from Thurso. I mentioned Paul Harrington's findings and asked the General for permission to search for the Kirtland's Warbler for one week at CFB Petawawa. General Dextrase graciously replied that I could visit the base at any time, that he would provide a vehicle with driver for me, and that I could ask for a helicopter to search the whole area from the air to determine where to search on the ground. I eagerly accepted his generous offer.

On the first day of the search on 8 June 1977, I drove on many of the base's roads and selected where to start searching. The search procedure was to frequently play a recording of a Kirtland's Warbler song. The theory was that a resident male warbler would try to scare all competitors away from his own territory.

At our first stop the next day, 9 June 1977, Jacques Bouvier (then with Algonquin College, Pembroke, Ontario) and I found a Kirtland's Warbler singing in a young jack pine stand. It did not try to frighten us away. It just continued to sing to attract a mate. We took photographs, and then set off to search for more birds, but that was the only one we found.

I invited birding friends from Hudson and Pointe Claire, Québec, the Faculty of Forestry (University of Toronto) and the Royal Ontario Museum to visit. Jacques and I had found the bird on a Tuesday, and it was on the same territory on the

Wednesday. As we searched other areas, we checked back on it. Our friends arrived on Thursday and were greatly disappointed. The bird had flown. It was not there on Friday either.

### **Two Petawawa Territories**

People speculated about the bird's disappearance. There had been a tornado in Michigan a few days before, and perhaps the bird was blown off course as far as Petawawa. Harold Mayfield, a noted Kirtland's Warbler expert in Michigan and author (Mayfield 1960), claimed that either the bird was finding its way back to Michigan, or was too sick to fly all the way home.

On the following Monday, I started at the original site and found the Kirtland's Warbler singing there. I used flagging tape to mark the outer boundary of its territory, which was about one hectare in area. The bird disappeared again but reappeared the next day. Later that day, while a forest entomologist was noting the insects and blueberries that the bird ate, he noted the warbler's direction when it flew away from its established territory.

We asked our driver to drive in that direction across an open area to another forested area about 0.8 km away. We were delighted to learn that our bird had two territories. The second territory was much smaller. Now we could always find the bird — if it was not in one territory, then it was in the other. It was not flying back or too sick to fly back to Michigan.

Was it unusual to have two territories? I telephoned Lawrence Walkinshaw, author of *Kirtland's Warbler: The Natural History of an Endangered Species*, 1983. He confirmed that some males

Figure 2. The Kirtland's Warbler found on CFB Petawawa in 1977. It was the first Kirtland's Warbler to be banded in Canada. Photo: Paul Aird

have two territories. Sometimes a male warbler also has two mates and helps to feed the young on both nests.

### Banding

I then contacted Gerald McKeating of the endangered species staff at the Ontario Ministry of Natural Resources about our finding. He arranged for John Byelich, Chair of the United States Fish and Wildlife Service's Kirtland's Warbler Recovery Team in Michigan, and Larry Walkinshaw to come to Ontario to band the bird, which they did (Figure 2). In addition to placing the standard aluminum band on one leg, coloured bands were placed on both legs which represented a unique identification number. In addition, Larry collected the ends of three feathers for chemical analyses. After the banding, John Byelich invited me to become an Associate Member of the U.S. Kirtland's Warbler Recovery Team.

### Population Decline, Then Recovery

A census of singing male Kirtland's Warblers in Michigan was conducted in 1951, 1961 and 1971 (Figure 1). Walkinshaw (1983) attributed the primary cause for the decline from 1951 to 1971 to persistent parasitizing of warbler nests by the Brown-headed Cowbird (*Molothrus ater*). Cowbirds do not build nests. They remove eggs from other nests and lay their own eggs inside.



Following the decline, the U.S. Kirtland's Warbler Recovery Team initiated a cowbird trapping and removal program, and conducted a more active jack pine and red pine (*Pinus resinosa*) reforestation program to increase the area of suitable habitat.

The downward slope of the Kirtland's Warbler population has since been replaced by an upward Kirtland's Warbler slope (Figure 1).

Following the unexpected decline in warbler numbers in the 1971 data, the U.S. census was conducted annually. The Kirtland's Warbler population in Michigan has since recovered to the point that in April 2018, the U.S. Fish and Wildlife Service (USFWS) published a proposed rule to remove Endangered Species Act protection for the Kirtland's Warbler due to the species' recovery. Publication of this proposed rule means that the Service believes the Kirtland's Warbler no longer faces the threat of extinction (USFWS 2018b).

### Ontario Listing

The Ontario status of the Kirtland's Warbler remains Endangered and its rarity is noted in the most recent atlas (2001-2005) of Ontario's breeding birds (Aird 2007).



I was fortunate to have almost a month of free lodging in 1977 as a visiting scientist at the Petawawa National Forest Institute, part of the Canadian Forest Service (CFS), located beside the army base. But in one of his first acts, the newly appointed director of the Institute told me to leave. "We do not support research on birds," he said. So my research base shifted to my tent pitched at a nearby campground.

I lived with the male we had found from 9 June to 14 July 1977, hoping a female would appear. I made note of the soil and the associated plants and animals in the bird's habitat, and searched for Kirtland's Warblers in other areas nearby. Although the bird was very tame, I never tried to feed him or name him. I respected him as a native bird at home in his jack pine habitat, undisturbed by humans.

Ninety days after the confirmed sighting of the Petawawa bird, the Kirtland's Warbler was listed as the thirteenth species to be protected as "Endangered" under Ontario's *Endangered Species Act*.

### **Searches in 1978—First Finding in Québec**

Stimulated by our 1977 finding, an independent search in 1978 found two male birds near Black River Falls, Wisconsin. One of these had been banded six years earlier by Larry Walkinshaw as a nestling in Michigan. Also in 1978, the Ontario Ministry of Natural Resources (OMNR) coordinated a search for the Kirtland's Warbler which involved searchers from the OMNR, the Canadian Wildlife Service (CWS), the Royal Ontario Museum, the University of Toronto and several field naturalist clubs (Chamberlain 1979). The searchers had no success.

On 2 June 1978, I returned to the Petawawa plains and found the same Kirtland's Warbler singing and feeding in the same trees as in 1977. The unique arrangement of coloured bands on the bird's leg proved that it was the same male, and it used the same two territories. Even though I knew that birds may migrate to the same location each year, I was still surprised.

The next day, I was joined in Kazabazua, Québec, by Jo Wright, a colleague from my home town of Hudson, Québec, Michel Gosselin, National Museum of Canada, and Francis Brabant and J.D. Lafontaine, both with the Province of Québec Society for the Protection of Birds. While Jo and I searched one new area, the other two searched another. Jo and I were successful. This new Kirtland's Warbler also did not try to scare us away. Instead, it flew away from us while singing and we followed. Jo was the first to get a clear view of the bird and discovered that it had been banded. We took photographs, and then found that this bird had two territories close together. They were much smaller than those of the bird in the Petawawa area.

This was the first confirmed sighting of a Kirtland's Warbler in Québec (Figure 3).

I then contacted the CWS in Gatineau (then named Hull), Québec. They arranged to meet me later that day to net the bird and read the numbers on the band. We also took feather samples to be chemically analyzed and compared with the Petawawa and Michigan birds. The following day, the CWS contacted the USFWS in Washington, D.C. to report the numbers. We then learned that Québec's

Figure 3: Kirtland's Warbler found at Kazabazua, Québec. This evening composition was selected by the author. *Photo: J.D. Lafontaine*

Kirtland's Warbler had been banded by Larry Walkinshaw four years earlier as a nestling in Michigan. This was the first evidence that Michigan-born birds dispersed beyond Michigan, and the first evidence to support my hypothesis stated earlier.

I decided to tell the owner of the Kazabazua site about our finding that one of 200 extremely rare birds in the world was living on his property. I assumed that he would be very pleased to know this. On the contrary, he was, rightly, furious that we had trespassed. He shouted that a University of Toronto professor and colleagues trespassing on his land was intolerable. I apologized, but he demanded a letter of apology and threatened to sue me. I could have left at any time, but I needed his permission to check on the bird over several weeks to see if it found a mate. So I deliberately prolonged our conversation by asking about an elk herd he had once raised on his property, the names of his dogs as I was patting one, offering the names of my dogs, and discussing the history of Kazabazua.

I asked where he worked. He was the Ottawa, Ontario, representative of Nesbitt, Thomson Inc., investment dealers. I told him that I knew Deane Nesbitt very well. Nesbitt was Chief Executive Officer of Nesbitt, Thomson Inc., and my cousin. Our conversation continued very amiably. He kindly gave me permission to go onto his property whenever I wanted to check on the warbler. We shook hands when we parted. (Unfortunately, with the passage



of time, I regret that I did not ask his name and therefore cannot acknowledge his helpful contribution to my research.) While checking other areas nearby, I checked his property regularly from 27 May to 21 June. What I had found was another lonely male. It did not return in 1979 or 1980.

### **Assumption Challenged**

In 1977, it seemed possible that the Petawawa bird could be a remnant of an Ontario race of the Kirtland's Warbler, separate and distinct from the Michigan race. But by 1978 and 1979, this theory was demolished by finding birds in Québec and Wisconsin that had been banded by Larry Walkinshaw as nestlings in Michigan. A common assumption had been that outlying birds had flown temporarily off course and would soon return to the Michigan breeding centre. However, this assumption was weakened by the fact of the Petawawa warbler defending its territory for more than five weeks in 1977 and returning to the same territory for more than six weeks in 1978.



In 1985, my colleague Donald Pope and I found a lone male Kirtland's Warbler on territory 20 km northwest of Orillia, Ontario, during visits on 22 June and 9 July (Aird and Pope 1987). The OMNR District Forester, Conservation Officer and others visited the territory and confirmed the sighting. I was disappointed that the District Forester chose not to band the bird. Banding is a very useful research tool, as has been shown above.

We had discovered that the Kirtland's Warbler was living in both Ontario and Québec. Since 2015, the species has been found in three other areas in Ontario and two in Québec. The finders and I are reluctant to identify any exact locations.

### **Additional Ontario Search Areas**

There are some areas that may deserve to be searched again. There are extensive jack pine forests on Manitoulin Island and neighbouring islands. Manitoulin Island (Figure 4) is latitudinally south of and longitudinally close to Michigan's Upper Peninsula, where 53 singing males were counted in Michigan's 2016 Upper Peninsula Kirtland's Warbler census (Huron Pines 2016)

Among the best sites we have found to search for the Kirtland's Warbler have been the Chapleau, Ontario, area along Highway 129 and Highway 667 (Figure 5), well north of Thessalon. Jack pine forests stretch as far as the eye can see. We have searched parts of these sites for many years starting in 2005. One particularly promising area for searching is the result of the SAU 013 forest fire in 2007. The area is easily accessible from Highway 129 north of Sharpsand River and south of Black Creek, about 100 km south of

Chapleau. In the burn area, young jack pine grows on flat and gently rolling outwash sands, which is the ideal habitat for Kirtland's Warbler nesting), but it is much farther north than Michigan's Upper Peninsula.

### **Return to Petawawa, 2006**

Canada's *Species at Risk Act* became law on 5 June 2003 but was not proclaimed in its entirety until June 2004. Because of this law, CFB Petawawa was required to determine if species at risk were present on its property. In 2005, the base hired a consulting firm to search for endangered species, including the Kirtland's Warbler. In 2006, the firm asked me to help and I volunteered to do so. Male Kirtland's Warblers stop singing by about the end of June, so we met in early June. Also, we thoroughly searched both beside and between the roads. On the morning of the first day, consulting biologist Tammy Richard and I found a male Kirtland's Warbler. On the afternoon of the first day, Tammy, consulting biologist Nancy Hiscock and I found a second male Kirtland's Warbler. A few days later, Tammy and Nancy found a third male. None of the three birds had been banded.

It took time to define the territories of the three birds, for we needed to know exactly where to find each bird so that each could be banded. The OMNR at Pembroke kindly permitted District Ecologist Daryl Coulson to help map their territories. Daryl also recorded their songs and created sonograms that were very useful for confirming the identity of returning birds in the following years.

Ken Tuininga of the CWS invited Carol Bocetti, Chair of the US Kirtland's



Figure 4. Manitoulin Island area showing Jack pine areas searched for the Kirtland's Warbler on Manitoulin Island and nearby islands intermittently from the 1980s to 2015. M1 Quarry Bay, M2 Belanger Bay, M3 Misery Bay, M4 Clapperton Island, M5 East Rous Island, M6 Great La Cloche Island, M7 Birch Island. *Google Earth image: 2004.*

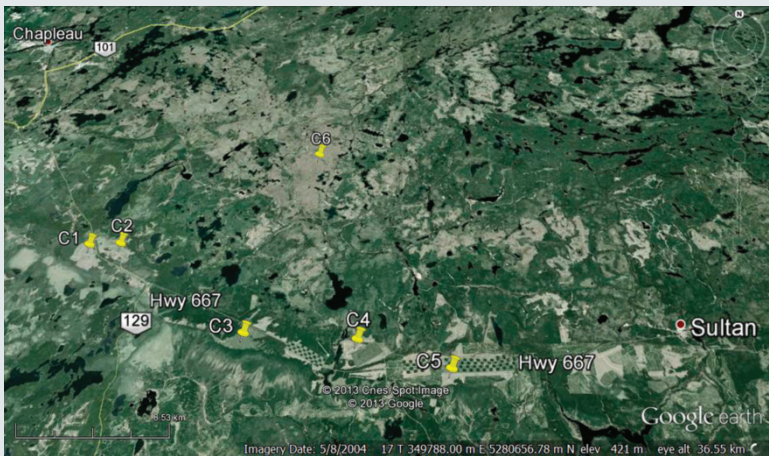


Figure 5. Chapleau, Ontario, area. Latitude 47°34'49.71" N; Longitude 83°02'17.90" W. The place marks (C1-C6) indicate most but not all of the jack pine areas searched for the Kirtland's Warbler southeast of Chapleau, Ontario. *Google Earth image: May 2004.*

Figure 6. The unique combination of coloured bands on this Kirtland's Warbler positively confirmed its presence on the same jack pine territory each year on CFB Petawawa from 2006 to 2012.

*Photo: Daryl Coulson, Ontario Ministry of Natural Resources and Forestry*



Warbler Recovery Team, to come to Ontario to band each bird and to discuss the conservation of endangered species. The CWS wanted to encourage a cooperative approach by including the U.S. Recovery Team in the recovery of the Kirtland's Warbler in Canada. I knew that Carol used a plastic lemon-shaped decoy to attract Kirtland's Warblers to fly into nets. I volunteered to provide it because such a container of lemon juice could not be carried across the Canada-U.S. border. The shape and colour of the container resembles the breast of a male Kirtland's Warbler. After a long mist net was strung between two poles, Carol stood on the side opposite the bird, broke a dead branch off a pine tree, pushed it into the soil (unaware of unexploded ordnance), dumped out the lemon juice, and pushed the container onto the other end of the branch. We both crouched down on the other side of the net. Daryl and Ken held the poles on

each end of the net, since they were not allowed to sink the poles in the ground because of unexploded ordnance in the area. I began playing a Kirtland's Warbler song on a tape recorder. Within three seconds, the bird tried to frighten the "intruder" away and was caught in the net. Carol quickly removed him from the net to measure, weigh, and clip three crown feathers from him for chemical analyses, banded and then released the bird (Figure 6).

Although I was not a participant in CFB Petawawa's searches after 2006 and do not have permission to share specific search results, I can nevertheless confirm that in more than one year since then, breeding pairs of Kirtland's Warblers have been found at Petawawa, with fledglings. As someone who has searched for these birds in Ontario for over 30 years and found several, it was extremely heartening to me to hear of their Ontario breeding success during my lifetime.

## U.S. vs. Canadian Approach

As a member of the Kirtland's Warbler Recovery Teams in both Canada and the United States, I was amazed at the starkly different approaches and attitudes of the armed forces to the conservation of Kirtland's Warbler habitat and the presence of the bird itself on their respective bases. At Camp Grayling, Michigan, the U.S. Army has, over many years, maintained an excellent working relationship with the U.S. Kirtland's Warbler Recovery Team. The U.S. Army is openly proud to contribute to the effort to conserve this endangered species on their lands. For example, Camp Grayling willingly adjusts land use for military training to protect Kirtland's Warbler habitat, permits Kirtland's Warbler Recovery Team members to conduct research on its base, and invites bus-loads of the public onto the base to see their birds on certain days of the year.

In contrast, since Kirtland's Warblers were found at CFB Petawawa in 2006, little information has been released on numbers of birds found, continuing searches for the birds, and maintenance of their habitats. I would like to know more. Is the Kirtland's Warbler's habitat increasing or decreasing at CFB Petawawa, and why?

We need to recognize and honour the fact that the Petawawa army base has been a summer home and a mating home for Kirtland's Warblers since at least 1916 — over a century.

I look forward to the day when CFB Petawawa, now named Garrison Petawawa, is proud of the fact that it is the custodian of the rare Kirtland's Warbler, one of Canada's national treasures thriving in its natural habitat. I hope and expect

that Garrison Petawawa will in future invite people to view, study, photograph and record the activities and songs of these exquisite birds during their May-June breeding season, and fully enjoy living with them and maintaining their habitat.

## Summary

To summarize the research and searching by me and my colleagues, it was generally assumed that Kirtland's Warblers could not be found by systematically searching beyond the northern limit of Michigan's lower peninsula, their only known nesting and breeding location. However, by searching for Kirtland's Warblers in jack pine habitats that resembled the best habitats in Michigan, Kirtland's Warblers have been found nesting in Ontario, Québec and Wisconsin. It had also been assumed that all outlying birds had simply flown off course and would return soon to the Michigan breeding centre. In fact, some Kirtland's Warblers living and breeding beyond Michigan have returned to live and breed beyond Michigan, year after year.

Hence, my 1977 hypothesis has been found to be supported over 40 years later: *Since Kirtland's Warbler nesting habitat becomes unsuitable within about 15 years, the ability of the Kirtland's Warbler to establish new nesting grounds beyond existing nesting grounds must be inherent in the individuals making up the species and essential to their continuing survival.*

The Kirtland's Warblers I have known have taught me this lesson: *How well we use, sustain and share our precious natural heritage of plants and animals defines our love of Canada and the world.*



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