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PAGES 1– 80

Articles

Book Reviews

Nikon Photo Quiz

Erratum

Cover Illustration: Kirtland's Warbler (*Dendroica kirtlandii)*
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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 proximately 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 Hiscock 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 m^2 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 Warbler 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 (*Dendrioca 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. McPeek 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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The successful nesting of the Piping Plover at Sauble Beach marks a return to the Canadian Great Lakes after 30 years

Brendan A. Toews, Kimberly J. Toews and Cindy E.J. Cartwright

Introduction

The soft piping and plaintive call of the Piping Plover (*Charadrius melodus*) was once heard on many beaches throughout the lower Great Lakes and Lake of the Woods in northwestern Ontario.

The Piping Plover is a small shorebird with a single black neck band, white collar across the nape, pale sand coloured upperparts, a complete white band across the upper tail coverts and orange legs. The two recognized subspecies (the Atlantic coastal *C. m. melodus* and the inland or Prairie *C. m. circumcinctus*) are distinguished by the respective absence or presence of a complete neck band (Moser 1942, AOU 1945), as well as their geographic distribution. Great Lakes birds align more closely with the Prairie population rather than Atlantic birds, based on recent mitochondrial DNA analyses (Elliot-Smith and Haig 2004). Experience with colour-banded birds suggests that there is no mixing between these two subspecies on the breeding grounds (Haig and Oring 1988).

Figure 1. Adult male Piping Plover with 32 day old juvenile at Sauble Beach on 26 July 2007.
Photo: Brendan Toews

The Piping Plover was declared an endangered species in Ontario in 1977, and in Canada, by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), in 1985 (Lambert 1987). The 2001 total estimated species population was 5,945 adults, with 1,454 in Canada, and the Northern Great Plains/Great Lakes population (*C. m. circumcinctus*) was estimated to be 3,026 adults, with 974 in Canada (Ferland and Haig 2002, Haig *et al.* 2005). The recovery goal for this subspecies in Canada is a minimum of 1626 adult birds found on three consecutive censuses (Environment Canada 2006).

Breeding is restricted to North America along the Atlantic coast from Newfoundland, Saint Pierre and Miquelon, and the Maritime provinces, south as far as North Carolina; inland breeding extends from Kansas and Nebraska in the Great Plains to the southern Prairie Provinces, and the western Great Lakes in Minnesota, Wisconsin and Michigan, and the Rainy River District of western Ontario (Haig 1992).

It winters in the southern United States, from North Carolina south along the coast to Texas, and into Mexico. Occasional sightings and surveys suggest that small numbers also winter on the Caribbean islands.

The Piping Plover has bred historically in Ontario on Lake Huron at Ipperwash Beach (1928-1953), Oliphant (1966-1972), Wasaga Beach (1913-1938) and Manitoulin Island (1970); on Lake Erie at Point Pelee (1906-1938), Pelee Island (1933), Holiday Beach (1909), Erieau (1946), Rondeau Provincial Park (1926-1947), Turkey Point (1924), Long Point (1905-1977), Long Beach (1938), Sherkston (1933-1944), Crystal Beach (1934) and Crescent Beach (1936); on Lake Ontario at Hamilton (1934), Toronto (1907-1934), Presqu'ile Provincial Park (1915-1916) and Prince Edward County (1924-1930); on the St. Lawrence River at Rockport (1894); in eastern Ontario on Collins Lake (1903); and in Rainy River District (1929-2007) in southeastern Lake of the Woods.

Historical breeding records of the Piping Plover in Ontario

The discovery of a pair of Piping Plovers at Sauble Beach, on 13 May 2007, by Brendan and Kimberly Toews, marked the first documented breeding record for Bruce County in 35 years, the first nest record on the Canadian Great Lakes in 30 years, and the only pair known to nest successfully in Ontario in 2007 (Figure 1). The purpose of this paper is to outline what is known of the historical breeding status of the Piping Plover in Ontario, and to provide behavioural and chronological observations of the 2007 nesting.

Historically, the Ontario breeding population of the Piping Plover was estimated to be 152-162 pairs (Russell 1983). This may have been an over-estimation based on the extrapolation of known birds to the entire potential available habitat. Many remote beaches were never surveyed, and few sites were checked consistently for breeding pairs, even when the species was known to be in decline. See Table 1 for a summary of the confirmed historical breeding records of the Piping Plover in Ontario. The large number of records for Long Point in the 1960s and 1970s is due to the presence of the Long Point Bird Observatory and its concerted census efforts, in addition to the availability of large tracts of undisturbed habitat. The extensive beaches of Long Point once hosted the largest breeding concentration of the Piping Plover anywhere on the Great Lakes (Snyder and Logier 1931, Sheppard 1935, Hussell and Montgomerie 1966, Cartar 1976, Bradstreet *et al.* 1977, Lambert and Nol 1978, McCracken *et al.* 1981). The beaches at Oliphant were not regularly checked after 1968, due to few local volunteers. The entire available beach habitat at Point Pelee, where they summered and may have nested as late as 1953 (Alan Wormington, pers. comm.), was likely inadequately surveyed after the 1930s as well.

Table 1: Summary of confirmed breeding records of the Piping Plover in Ontario (all records involving nests unless otherwise noted).

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
Rainy River District	1929	Sable Islands	James L. Baillie & Lester L. Snyder	Eight young observed	Successful two young collected (ROM# 29.9.9.20 & 29.9.9.21)
	1978	Sable Islands	Alan Wormington	Two nests	Outcome unknown
	1981	Sable Islands	William J. Crins & Ron Ridout	Two nests	Outcome unknown
	1987	Sable Islands	David H. Elder & Leo E. Heyens	Two nests	Outcome unknown
	1987	Sable Islands	Bruce Duncan	One nest	Outcome unknown
	1991	Sable Islands	Leo E. Heyens	One nest	Successful
	2007	Sable Islands	Leo E. Heyens	One nest	Failed due to flooding
	1987	Windy Point	David H. Elder	One nest	Outcome unknown
	1992	Windy Point	P. Allen Woodliffe & Leo E. Heyens	One nest	Outcome unknown
	1992	Windy Point	Leo E. Heyens	One nest	Outcome unknown
	1993	Windy Point	Glenn Coady	One nest	Outcome unknown
	1995	Windy Point	Leo E. Heyens	One nest	Outcome unknown
	1996	Windy Point	Leo E. Heyens	One nest	Successful
	1997	Windy Point	Leo E. Heyens	One nest	Successful
	1998	Windy Point	Leo E. Heyens	Two nests	Both successful
	1999	Windy Point	Leo E. Heyens	One nest	Successful
	2000	Windy Point	Leo E. Heyens	One nest	Outcome unknown
	2001	Windy Point	Leo E. Heyens	One nest	Failed due to flooding
	2002	Windy Point	Leo E. Heyens	Two nests	Failed due to flooding
	2007	Windy Point	Leo E. Heyens	Two nests	Failed due to flooding
Manitoulin	1970	Carter Bay	John C. Nicholson & Christopher T. Bell	Adults with downy young	Successful

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
Bruce	1966	Oliphant	Malcolm D. Kirk	Two nests	Outcome unknown
	1966	Oliphant	Ken Carmichael	One nest	Outcome unknown
	1967	Oliphant	Eric A. Nasmith	One nest	Outcome unknown
	1968	Oliphant	Eric A. Nasmith	One nest	Outcome unknown
	1972	Oliphant	Donald A. Sutherland	One nest	Outcome unknown
	2007	Sauble Beach	Brendan A. Toews & Kimberly J. Toews	One nest	Successful
Simcoe	1913	Wasaga Beach	Paul Harrington	One nest	Successful
	1921	Wasaga Beach	Paul Harrington & Frederic A.E. Starr	One nest	Collected (ROM# 5274)
	1933	Wasaga Beach	Otto E. Devitt	One nest	Successful
	1934	Wasaga Beach	Otto E. Devitt	One nest	Outcome unknown
	1938	Wasaga Beach	Otto E. Devitt	One nest	Outcome unknown
Essex	1906	Point Pelee	William E. Saunders	Two nests	Outcome unknown
	1907	Point Pelee	William E. Saunders	Two nests	Outcome unknown
	1937	Point Pelee	Otto E. Devitt	One nest	Outcome unknown
	1938	Point Pelee	James L. Baillie	One nest	Outcome unknown
	1909	Holiday Beach	William E. Saunders	One nest (6-8 pairs)	Successful
	1933	Pelee Island	Edgar M.S. Dale	Two nests	Outcome unknown
Lambton	1928	Ipperwash Beach	William E. Saunders	Young observed	Successful
	1953	Ipperwash Beach	*fide* Alice H. Kelley	Pair with downy young	Successful
Chatham -Kent	1926	Rondeau Provincial Park	Albert A. Wood	Two nests	Collected (ROM# 12558)
	1937	Rondeau Provincial Park	Douglas S. Middleton	One nest	Outcome unknown
	1938	Rondeau Provincial Park	Douglas S. Middleton	One nest	Outcome unknown
	1947	Rondeau Provincial Park	Douglas S. Middleton	One nest	Outcome unknown

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
	1946	Erieau	Albert A. Wood	One nest	Outcome unknown
Norfolk	1924	Turkey Point	Gerald W. Knechtel	One nest	Outcome unknown
	1905	Long Point	William E. Saunders	Six nests	Outcome unknown for all nests
	1907	Long Point	W.E. Clyde Todd	One nest	Successful
	1908	Long Point	William E. Saunders	Seven nests	One nest collected (ROM# 5277) Outcome unknown for six nests
	1924	Long Point	William E. Saunders	Eight nests	Outcome unknown
	1927	Long Point	Lester L. Snyder	One nest	Successful
	1928	Long Point	Lester L. Snyder	Two nests	Both collected (ROM# 314 & 8026)
	1949	Long Point	Harold L. Lancaster	One nest	Outcome unknown
	1957	Long Point	George Francis	One nest	Outcome unknown
	1961	Long Point	James K. Woodford & David J.T. Hussell	Two nests	One nest successful One outcome unknown
	1962	Long Point	James L. Baillie	One nest	Outcome unknown
	1962	Long Point	Ralph McLeary	Three nests	Outcome unknown for all nests
	1962	Long Point	David J.T. Hussell & Robert D. Montgomerie	Four nests	Outcome unknown
	1963	Long Point	David J.T. Hussell & Robert D. Montgomerie	Five nests	Three nests successful Two outcome unknown
	1964	Long Point	Richard C. Rosche	One nest	Outcome unknown
	1964	Long Point	David J.T. Hussell	Six nests	One nest successful Three nests failed due to predation Outcome unknown for two nests
	1965	Long Point	Tony Davis & Robert D. Montgomerie	One nest	Collected (ROM# 9962)

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
	1965	Long Point	Tony Davis	Six nests	Three nests successful Three nests failed due to predation
	1966	Long Point	Gary W. Page	Two nests	One nest failed due to predation One nest successful
	1967	Long Point	Gary W. Page	Three nests	Two nests successful One nest failed
	1968	Long Point	Michael S.W. Bradstreet	One nest	Nest failed due to predation
	1968	Long Point	Robert Whittam	One nest	Successful
	1969	Long Point	Michael S.W. Bradstreet & Gary W. Page	One nest	Nest successful
	1970	Long Point	George W. North	One nest	Nest successful
	1971	Long Point	Ralph Carter	Young observed	Successful
	1972	Long Point	Alan Wormington	One nest	Outcome unknown
	1973	Long Point	Douglas Nakashima	One nest	Successful
	1974	Long Point	Gary W. Miller	Four nests	Two nests successful Two nests outcome unknown
	1975	Long Point	Will Joyce	One nest	Outcome unknown
	1975	Long Point	Gary W. Miller	Three nests	Two nests failed due to predation One nest successful
	1975	Long Point	Benton Basham	One nest	Outcome unknown
	1975	Long Point	Ron Pittaway	One nest	Outcome unknown
	1976	Long Point	Gary W. Miller	Six nests	One nest successful Four nests failed due to predation One nest failed due to flooding
	1977	Long Point	Gary W. Miller	One nest & six unmated males	Nest failure
Niagara R.M.	1933	Sherkston	Mr. & Mrs. T.M.Kelly	Young observed	Successful

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
	1934	Sherkston	Mr. & Mrs. T.M. Kelly	One nest	Outcome unknown
	1936	Sherkston	Alice E. Sherman	One nest	Successful
	1938	Sherkston	T.M. Kelly, Lloyd Mansfield *et al*.	One nest	Outcome unknown
	1944	Sherkston	Robert F. Andrle, John Filor, Arthur Schaffner *et al*.	Two nests	Outcome unknown
	1934	Crystal Beach	Mr. & Mrs. T.M. Kelly	One nest	Outcome unknown
	1936	Crescent Beach	Winston W. Brockner & Bertha Schwenger	One nest	Outcome unknown
	1938	Long Beach	Thomas L. Bourne	Young observed	Successful
Hamilton	1934	Van Wagners Beach	George W. North & Otto E. Devitt	One nest	Successful
City of Toronto	1907	Fisherman's Island	W.R. Humphreys	One nest	Successful
	1908	Toronto Island	James H. Fleming	Three nests	Two nests successful One outcome unknown
	1910	Toronto	James A. Munro	One nest	Outcome unknown
	1923	Toronto Island	Jack Satterly	Two nests	Outcome unknown
	1928	Fisherman's Island	Frederick H. Emery & James L. Baillie	One nest	Collected
	1928	Fisherman's Island	Paul Harrington & James L. Baillie	One nest	Collected (ROM# 10988)
	1928	Fisherman's Island	Stuart L. Thompson & James L. Baillie	One nest	Collected (ROM# 7637)
	1928	Fisherman's Island	James L. Baillie	One nest	Collected
	1929	Fisherman's Island	K.W. Lomax	One nest	Outcome unknown
	1929	Fisherman's Island	Frederic A.E. Starr	One nest	Outcome unknown
	1934	Hanlan's Point	G. Hubert Richardson	One nest	Downy young collected (ROM# 92484/92485)
Northumb-erland	1915	Presqu'ile Provincial Park	Charles J. Young	One nest	Outcome unknown

COUNTY	YEAR	LOCATION	OBSERVER	EVIDENCE	OUTCOME
	1916	Presqu'ile Provincial Park	Charles J. Young	One nest	Outcome unknown
Prince Edward	1924	Bald Head Island	Edwin Beaupré	One nest	Collected (ROM# 4466)
	1924	Consecon	Edwin Beaupré & Charles J. Young	Five breeding pairs	Outcome unknown
	1926	Consecon	Edwin Beaupré	One nest	Collected (ROM# 19)
	1930	Sandbanks Provincial Park	Lester L. Snyder	One nest	Adults collected
Frontenac	1903	Collins Lake	Edwin Beaupré	One nest	Collected (ROM# 283)
Leeds	1894	Rockport	Charles J. Young	One nest	Collected (CMN# CMNAV E319)

ROM = Royal Ontario Museum CMN = Canadian Museum of Nature

The Piping Plover has faced many threats in the past 40 years which have led to its endangered status. The increased use of beaches for recreational activities has been a significant contributing factor in its decline. The most frequently recognized problem is the accidental destruction of nests by pedestrians and vehicles and the disturbance of nesting birds. Vehicular use of beaches also damages the delicate ecosystem, contributing to a decrease in insects and microfauna available to foraging birds and the destruction of plant cover. Predator species such as gulls, crows, Merlin (*Falco columbarius*), Northern Raccoon (*Procyon lotor*), skunks and Virginia Opossum (*Didelphis virginianus*), have all increased since the 1960s, likely further contributing to the decline (Lambert 1987, Sauer *et al.* 2003). Sustained high water levels from the mid-1970s, to the 1986 peak levels, either flooded or remodeled much of the suitable beach habitat in the lower Great Lakes. This extensive habitat loss coincided with the timing of the extirpation of the Piping Plover from the lower Great Lakes. High water levels continue to be a problem for stable beach habitat in the Lake of the Woods area today.

The increase in severe weather during migration and on the wintering grounds may influence the remaining population numbers. Development, dredging and beach stabilization projects on the wintering grounds may also be a contributing factor and more research is needed in this area. Additional threats to the Piping Plover include

boats, oil spills, mosquito control, hurricanes and West Nile virus (Stucker and Cuthbert 2006).

Anecdotal evidence from local residents in Bruce County suggests possible historical nesting of Piping Plovers on the beaches at Southampton, Sauble and Oliphant in the first half of the twentieth century, but no specific details or documentation has been located. Prior to daily beach grooming, it is plausible that plovers used these sites due to the availability of suitable habitat. There are five nest records for Bruce County between 1966 and 1972 (see Table 1) in the Ontario Nest Record Scheme (ONRS). Due to a lack of regular surveys and local researchers, the beaches in this area were not routinely checked for Piping Plovers in subsequent years. International Piping Plover surveys conducted in Bruce County in 2001 and 2006 did not locate any birds.

Records of single transient Piping Plovers in Bruce County have occurred at: Singing Sands, Dorcas Bay on 8 May 1989; Oliphant on 26 April 1990 and 21 May 1991 (Bain 1992); Point Clark on 27 May 1991 (Bain 1992); Sauble Beach on 31 May 1991 (Dobos 1999); and Miramichi Bay, Saugeen Shores from 22-23 May 2000 (Roy 2001). On 18 May 2002, a pair was discovered at Oliphant Beach by Don Sutherland, but only a single bird remained until 9 June, before disappearing, possibly disturbed by beach activities (Heyens 2007).

The last known attempted nesting of the Piping Plover on the Canadian shores of the Great Lakes was a failed nest at Long Point in 1977 (Lambert and Nol 1978). The loss of the long-thriving population at Long Point was attributed to a combination of increased predation from raccoons and a newly expanded population of Ring-billed Gulls (*Larus delawarensis*) and nest destruction and changes in beach structure due to flooding associated with high water levels (Ludwig 1974, Miller 1977, Hussell 1980, McCracken *et al.* 1981).

Since 1977, there have been very few records involving potential breeding evidence for the Piping Plover on the Canadian side of the Great Lakes. In 1978, three unmated, territorial males were seen at Long Point, but no females or nests were located.

On 27 June 1981, a territorial pair was found at Wasaga Beach by Alvaro Jaramillo, but no evidence of nesting was confirmed (Lambert 1987, Wormington 1987). Unmated territorial male Piping Plovers were observed at Long Point from 23 May – 2 June 1989 (Wormington and Curry 1990), 5 June – 15 July 1992 (Bain 1993), 2 June – 15 July 2000 (Roy 2001) and 10 – 15 June 2001 (Crins 2003). The pair found at Oliphant by Don Sutherland on 18 May 2002 apparently failed to nest, with only a single bird remaining until 8-9 June (D. A. Sutherland, unpublished). A territorial pair was observed courting at Wasaga Beach throughout May 2005, but despite very promising indications, the female disappeared thereafter. Although the male remained present

throughout much of June, no evidence of an occupied nest was recorded (Heyens 2005, Jackson 2005).

Recent breeding by the Piping Plover is documented in three Great Lakes states (Michigan, Wisconsin and Minnesota) adjacent to Ontario. The Michigan population of 58 breeding pairs in 2005 is reported to have a self-sustaining rate of fledged young (Cuthbert 2006), and is a potential source of immigration for re-colonizing historical breeding sites in Ontario, since first year Piping Plovers in the Great Lakes basin have demonstrated a range of natal dispersal distances from 2 – 430 kilometres (Price 2002) and an annual adult survival rate of 73% (Wemmer *et al.* 2001). The Great Lakes basin population has more than tripled, from 40 individuals in 1991 to ~125 individuals in 2005 (Environment Canada 2006).

Individual migrant Piping Plovers documented at Beaverton on 2 June 1996 (Dobos 1997), Darlington Provincial Park from 1–4 May 2002 (Worthington 2002, Crins 2003), Burlington Beach on 7 May 2004 (Crins 2005, Curry 2006), Rondeau Provincial Park on 17 May 2004 (Crins 2005), Presqu'ile Provincial Park from 21 May – 8 June 2005 (Crins 2007) and 29-30 May 2006, as well as the courting pair documented at Wasaga Beach in May 2005 (Heyens 2005, Jackson 2005), the pair that nested successfully at Sauble Beach in 2007, and the single adult observed at Wasaga Beach on 9 August 2007, were all identified by colour bands as originating from the growing Michigan population.

Despite high adult breeding site fidelity of 84% (Wiens and Cuthbert 1988) and natal philopatry of 70% (Haig and Oring 1987), the small breeding population remaining in the Lake of the Woods area of northern Minnesota has declined dramatically from 40 to 50 individuals in the early 1980s (Wiens and Cuthbert 1984) to five adults (and only one breeding pair) in 2003 (Haws 2005). The crash of this population threatens the continued occurrence of the Piping Plover as a breeder in western Rainy River District, and perhaps its extirpation from Ontario entirely. This is of great concern, since this population serves as the only geographical link between the Northern Great Plains/Prairie population and the recovering Great Lakes population (Environment Canada 2006).

Discovery of the Piping Plover pair at Sauble Beach in 2007

The discovery and successful nesting of the Piping Plover pair at north Sauble Beach was an exciting and historical event in 2007. On the afternoon of 13 May, Brendan and Kimberly Toews set out from their summer residence to visit Sauble Beach in Bruce County. The family had been coming to the area since 1989, and knew that the beach was a good site for birds. Brendan brought his binoculars and digital camera, and they walked along the beach observing and photographing Ring-billed Gulls,

Figure 2. Beach dune habitat of the Piping Plover territory on 15 May 2007. *Photo: Brendan Toews*

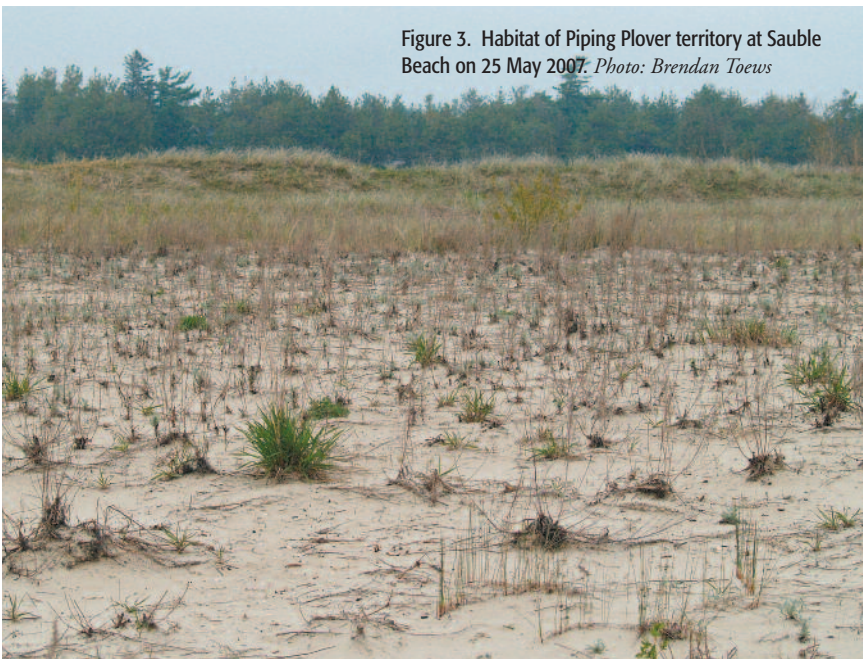

Figure 3. Habitat of Piping Plover territory at Sauble Beach on 25 May 2007. *Photo: Brendan Toews*

Herring Gulls (*Larus argentatus*), Common Terns (*Sterna hirundo*), Caspian Terns (*Hydroprogne caspia*) and Killdeer (*Charadrius vociferus*).

Upon arrival at the north end of the beach, Kimberly observed a small shorebird foraging at the water's edge. This shorebird did not vocalize or act defensively. She brought it to Brendan's attention and he immediately realized that the bird was either a Piping Plover or Snowy Plover (*Charadrius alexandrinus*). Although neither observer had previous experience with the species, by working through the field marks, Brendan correctly identified it as a Piping Plover. This was also confirmed by comparing photographs of the bird with several field guides.

There was extensive Piping Plover nesting habitat available at Sauble Beach, since the dunes had been allowed to regenerate and naturalize over several years (Figures 2 and 3). Since 2000, the Friends of Sauble Beach (a non-profit group of volunteers that actively promote respect for this fragile environment) had been engaged in efforts to naturalize this beach. This included planting native flora to rehabilitate the beach dunes and reducing the number of beach access points from nearly two hundred to twelve.

Although finding an endangered species in Canada was the highlight of the Toews' birding season, it was even more exciting that this sighting involved the rarest of Ontario's four breeding plover species in alternate plumage.

Figure 4. Adult female (left) and adult male (right) Piping Plovers at Sauble Beach on 17 May 2007.
Photo: Brendan Toews

Both observers quickly noted that the plover was banded. They knew that the Piping Plover was designated an endangered species in Ontario and Canada, and that they would need to report the bird to authorities. Within moments of Kimberly discovering the male plover, Brendan located a banded female Piping Plover that was heading inland towards the vegetated dunes. He identified it as a likely female because it was much paler in colour compared to the first bird, with reduced amounts of black. The presumed male had more prominent forehead and breast bands and its back

was darker in colour (Figure 4). The sexes of these birds were confirmed subsequently by their colour band combinations. Brendan understood that there had not been a Piping Plover nest record in the general area since the early 1970s.

Nesting chronology of the Piping Plovers at Sauble Beach in 2007

On 14 May, Brendan and Kimberly returned to the north end of the beach to confirm that the Piping Plover pair was still present before reporting the sighting to others. That evening, Brendan completed an on-line rare bird report for the Ontario Bird Records Committee (OBRC). Ian Richards, Secretary of the OBRC, promptly replied to Brendan, thanking him for submitting the online report, and asked him to forward some of his photographs. Ian confirmed that these were Piping Plovers in appropriate habitat, and that he suspected nesting might be likely. Ian contacted Donald Sutherland at the Natural Heritage Information Centre (NHIC) of the Ontario Ministry of Natural Resources (OMNR), and Jeff Robinson of Environment Canada's

Canadian Wildlife Service (CWS), in order to get the Piping Plover recovery team quickly involved in protecting any potential breeding attempt.

On the morning of 15 May, Jeff Robinson contacted the regional Species at Risk staff of Environment Canada to initiate an effort to secure the site in the case of a breeding attempt. He also forwarded Brendan's images to Jack Dingledine, a Michigan biologist with the United States Fish and Wildlife Service (USFWS), to determine the origins of the banded Piping Plovers. The leg band combinations documented in the photographs confirmed that the male (band combination: aluminum on right tibia, blue/orange/blue on right tarsus, orange on the left tibia) had hatched and fledged in 2006 on the shore of Lake Michigan at Ludington State Park, Michigan, making it a first time breeder (Figure 5). The female (band combination: aluminum on the right tibia, very pale green on right tarsus, no bands on the left leg) was four years old, and originally from Sleeping Bear Dunes National Lakeshore, Michigan, on the shore of Lake Michigan (Figure 6).

(top) Figure 5. Adult male Piping Plover at Sauble Beach on 7 July 2007. *Photo: Brendan Toews*

(right) Figure 6. Adult female Piping Plover at Sauble Beach on 3 July 2007. *Photo: Brendan Toews*

(far right) Figure 7. Male Piping Plover performing aggression display toward a Killdeer at Sauble Beach on 15 May 2007. *Photo: Brendan Toews*

Figure 8. Male Piping Plover performing courtship display for the female at the nest scrape on 17 May 2007. *Photo: Brendan Toews*

Figure 9. Male Piping Plover excavating the nest scrape on 17 May 2007. *Photo: Brendan Toews*

That afternoon, the likelihood of local breeding appeared high, as Kimberly and Brendan witnessed the male Piping Plover performing displays of territorial aggression toward a Killdeer that approached it too closely (Figure 7).

On 17 May, Brendan and Kimberly first noted a nest scrape in a section of dune on the south side of the north end beach access. The male was observed doing courtship displays to the female (Figure 8) and aggression displays towards nearby Ring-billed Gulls near this scrape. The male was photographed excavating this nest scrape (Figure 9), and the pair then took turns sitting on the nest. A second nest scrape was also located.

On this day, Norah Toth, Natural Heritage Education Specialist at MacGregor Point Provincial Park, was the first to organize volunteers to help monitor the plover pair at the request of the OMNR. Along with birder Mike Pickup from Saugeen Shores, she began organizing volunteers from the Bruce Birding Club and the Owen Sound Field Naturalists to help monitor the plovers.

On 19 May, the first volunteers began what would become a nearly continuous stewardship program in aid of these endangered breeding birds. Brendan and Kimberly briefed the volunteer groups on the locations of the nesting and principal foraging areas of the plovers, as well as the various immediate threats they faced from off-leash dogs, stray cats, raccoons, foxes, gulls, beach walkers, cyclists, fireworks, and motorized vehicles (all-terrain vehicles for by-law enforcement, garbage collection vehicles, and tractors for beach grooming). Beach raking operations in the area were suspended so that the birds would not be harmed or disturbed. There was also a moratorium placed on vehicle access and garbage bins were removed from the immediate area to deter scavenging gulls and mammals.

The committed corps of volunteers was drawn from Sauble Beach, (local area residents, cottage owners, local businesses), the Bruce Birding Club, the Owen Sound Field Naturalists, Friends of Sauble Beach, Friends of MacGregor Point Provincial Park, Ontario Parks, the Huron Fringe Birding Festival Committee, Parks Canada, the Ontario Field Ornithologists, as well as many others who made special effort to help with the program. The volunteer guardians monitored the nest site in all types of weather, from dawn until late in the evening, and around the clock on holiday weekends. They observed and photographed behaviours of the birds and recorded daily observations. The guardians wore white shirts with a Piping Plover on the back and the motto "helping one bird at a time". Besides serving to protect the nesting plovers, the volunteer stewards played a valuable role in public relations and visitor education, eventually distributing over 1500 information brochures to more than 3000 interested visitors. They served as knowledgeable interpreters at spotting scopes set up for the public to view the birds from a safe

distance. Stewart Nutt from Southampton was eventually appointed as coordinator of this volunteer group of guardians. This exemplary conservation effort eventually became a popular media story, garnering coverage from the Owen Sound Sun Times, the Toronto Star, the Ottawa Citizen, Rogers Cable television, and the Canadian Broadcasting Corporation, among others.

Copulation by the plovers was first observed by Peter Middleton on the afternoon of 24 May. Plans were being formulated between CWS and OMNR staff to erect a predator exclosure around any eventual nest site, using trained staff working under the auspices of federal permit.

On the morning of 25 May, the male was vigorously vocalizing and repeatedly throwing sand from one of the nest scrapes. At 0904 hrs, the pair was observed copulating at the nest site (Figure 10). Following copulation, both plovers took turns sitting on the nest. While the female was sitting on the nest, the male displayed and vocalized in front of her with its tail fanned and wings outstretched. Whenever the female vacated the nest, the male immediately either sat in the nest or continued excavating.

Figure 10. Pair of Piping Plovers copulating over the nest scrape on 25 May 2007.
Photo: Brendan Toews

Figure 11. Male Piping Plover foraging on the Lake Huron shoreline at Sauble Beach on 3 July 2007. *Photo: Brendan Toews*

The Piping Plovers appeared to feed on aquatic insects and larvae gleaned from the dune plants and the lakeshore, crustaceans, larvae from wrack, and various aquatic invertebrates. They would alternately sprint a short distance, abruptly pause, then peck or probe for food in the sand along the water, or on plants. Rarely, the birds would scrape the sand near the water with one foot, and then peck and feed. They foraged in the dunes, on the shoreline, and at the edge of creeks (Figure 11).

Observations of the nest scrape were kept to a minimum and made exclusively by trained staff working under the authority of federal permit. The first pale, buff-coloured, black-speckled egg was detected in this nest at 1159 hrs on 26

Figure 12. Nest and three eggs of the Piping Plover pair on 30 May 2007. *Photo: Brendan Toews*

May (ONRS #191787). The nest still contained one egg at 0654 hrs, and at 2120 hrs on 27 May the nest contained a second egg. On 28 May, both sexes alternated between incubation duties and feeding opportunities.

As a protective measure, the nest area was widely cordoned off and a restricted perimeter was defined with long metal fence posts, nylon rope, yellow caution tape and Piping Plover signage, on 29 May. All protective measures taken on behalf of this endangered species were done under the authority of federal permit, and all photographs were limited to being taken from beyond the cordoned area once it was established. At 0630 hrs on 30 May, the nest contained three eggs, and the nest scrape contained some shells, pebbles and sticks (Figure 12). By 1 June, the nest contained a complete clutch of four eggs, and efforts were underway to erect an exclosure to ensure the birds had the best chance

at successful nesting (Nest location: 17 478013 4945121 NAD83; 44° 39′ 32.82″ N, 81° 16′ 38.4″ W).

Predator exclosures significantly reduce nest predation by protecting the eggs and birds from gulls, crows, merlins, owls, raccoons, skunks, foxes, dogs, cats, and other predators. Precedent and guidelines for the use of such exclosures are well established (Richardson 1997, Schmelzeisen and Engley 2003). Prior to its construction over the nest, three practice runs were performed further down the beach, to work on reducing the disturbance associated with the time required to erect it. After flushing the female from the nest, Angela McConnell (CWS), Jessica Jackson (OMNR), Kirk Silver (OMNR), Peter Middleton and Norah Toth completed construction of the exclosure in a mere 17 minutes (Figure 13). During this time, both the male and female plovers remained in the area vocalizing constantly, with the female feigning a broken wing display.

Upon completion of the exclosure, the female returned to the nest without hesitation, and both birds were subsequently observed taking turns at incubation duties (Figure 14).

Figure 13. Newly erected nest exclosure on 1 June 2007. *Photo: Brendan Toews*

This exclosure required no repairs in the 70 days it was left in place, and remarkable plant growth occurred in this undisturbed area (Nutt 2007).

For most of the remainder of the incubation period, the male and female plovers alternated incubation duties every 30–60 minutes, leaving the exclosure periodically whenever disturbed by potential predators such as gulls, foxes and cats. The adults were frequently observed attacking a gull when it ventured too close to the nest. The female also left the nest unattended for short periods, and once for a longer period, when the male was missing for more than a day.

Figure 14. Male Piping Plover incubating four eggs within the nest exclosure in June 2007.
Photo: Brendan Toews

On 20 June, a live trap was set up for a Red Fox (*Vulpes vulpes*) that habitually visited the nesting area, and interpretive Piping Plover signage (donated by Jack Dingledine on behalf of the USFWS) was installed at the perimeter of the exclusion area.

By 23 June, the plovers were switching duties at the nest more frequently (every 15 minutes), and spent noticeably more time readjusting the eggs. On 24 June, the female was seen removing a piece of egg shell from the nest. Two hours later, confirmation of the emergence of the first chick was made. This downy chick moved about a metre away from the nest and stayed there for 10 – 15 seconds before running under the adult. By that afternoon, the second and third chicks were seen, and they stayed out for 1 – 3 minutes before moving back to the nest to be brooded under the male. The fourth chick was first seen on 26 June, when it was considerably smaller than the other three chicks.

All four chicks followed the adults to the south end of the cordoned nesting area to forage. The chicks typically moved under the wings of both of the adults and would instinctively freeze in a crouch position in response to alarm notes from either adult. The female brooded all four chicks several times throughout the day (Figure 15). On 27 June, there were very strong winds at the beach, and the chicks remained high up in the dunes among the thick vegetation for most of the day. Two of the chicks were becoming more independent, foraging by themselves and straying a little further from the adults.

Both the male and female actively defended the chicks from aerial attacks by gulls. Despite their strong defense instinct, however, one of the chicks was lost to unknown causes on 29 June.

Figure 15. Female Piping Plover brooding four day old chicks at Sauble Beach on 28 June 2007. *Photo: Brendan Toews*

Figure 17. Piping Plover pair exhibiting defensive display in leading a Ring-billed Gull away from their young on 7 July 2007.
Photo: Brendan Toews

Figure 16. Nine day old Piping Plover chick at Sauble Beach on 3 July 2007.
Photo: Brendan Toews

The rest of the plover family then moved about 250 m north to the river, where they would spend much of their time over the next few weeks.

On 1 July, the Canada Day weekend crowds inevitably meant that the volunteer guardians had to spend more time on crowd control to allow the increasingly mobile plover family to safely move to and from favoured foraging areas.

In the early morning of 2 July, a fox appeared from the north and moved through the cordoned area three times over forty minutes. When it approached the chicks, they were vigorously defended by the adults, who led the fox away from the young by flying in front of it, crouching or feigning a broken wing display, and then flying and landing further away to divert its approach.

By 3 July, the young could move quickly on foot, although one of the three chicks was smaller and often lagged behind its siblings. One of the nine day

Figure 18. An 18 day old Piping Plover chick being banded at Sauble Beach on 12 July 2007. *Photo: Brendan Toews*

old chicks was observed making an aborted early attempt at flight. It was running around in circles and flapping its wings. With the warmer temperatures, the chicks spent less time being brooded and more time foraging independently (Figure 16).

On 5 July at 0530 hrs, the plover chicks were banded by Martin Wernaart, Madeline Austen (CWS), Jeff Robinson (CWS) and Christine Vance (Parks Canada), aided by Stewart Nutt, and volunteer guardians Peter Middleton, Doug Pedwell and Don Kennedy. When the chicks were being brooded under the male, they were then carefully directed to an area of open beach and quickly caught. The entire banding process took about 15 minutes from capture to release. The three chicks quickly rejoined the male after the banding operation was complete. Two of the chicks weighed 18 grams and the third weighed 17 grams. All of the chicks were deemed healthy and banded with different combinations of aluminum USFWS band and orange and yellow colour bands (Nutt 2007).

On 7 July, the adults spent much of the time defending the chicks from Ring-billed Gulls. The male attacked and the female exhibited broken wing

behavior, both leading the gulls away from the chicks. At other times, the pair intercepted individual gulls, walking beside the gull and moving ahead of it, while turning away and crouching on the sand (Figure 17). Both adults were also very aggressive towards a Spotted Sandpiper (*Actitis macularius)* which landed near them. The male chased it about 200 metres down the beach.

In the afternoon, a group of beach partiers set up too close to the plovers and refused requests by the volunteer guardians to move a little further away. They agreed to move when subsequently requested to do so by local bylaw enforcement officials and the Ontario Provincial Police.

At 2120 hrs, the Piping Plover chicks came under attack by a Merlin, and one chick had a particularly close call. Although none of the birds were taken, the chicks could not be located for some time. Both adults flew directly at the Merlin, forced it to the ground twice, and eventually chased it completely out of the area.

On the afternoon of 9 July, Brendan and Kimberly heard the male plover vocalizing a loud "*pipe-pipe-pipe*" call. It was then observed displaying to the female by erecting its feathers and bringing its wings forward and spreading its tail, aggressively facing and moving toward the female.

On 10 July, sixteen days after the hatching of the first chick, the female left the area for good, leaving the family in the care of the male. Females commonly desert broods 5-17 days after hatching (Elliott-Smith and Haig 2004). Although the male vocalized for an extended period (even continuously for up to 25 minutes), presumably trying to establish contact with the female, it ultimately concentrated its efforts on guarding the chicks. The first of the chicks was later observed making its first abrupt flight of less than a metre.

On 12 July, a successful effort was made to re-check the bands on all of the chicks, since it was noticed from photographs that one of the bands on a chick had become displaced. The young were corralled toward the beach by Don Kennedy, Ethan Meleg, Peter Middleton, Stewart Nutt, Doug Pedwell, Brendan Toews and Kimberly Toews, and were quickly captured and examined by Martin Wernaart, Christine Vance and Jeff Robinson. All three chicks had their bands checked and their weights measured, and were then quickly released back in the vicinity of the male. All of the chicks had doubled their weight from 18 to 36 grams in the seven days since they were first banded (Figure 18).

From 15–18 July, the juvenile plovers spent the majority of their time foraging and resting, and began to exercise their wings extensively, including taking some short flights. On 19 July, one of the chicks was observed in flight for more than 40 metres. By 21 July, the three juveniles appeared to be similar in size to the male and began to forage further away from the male with greater frequency. On 22 July, the male was

Figure 19. Three 32 day old juvenile Piping Plovers huddled together in a sand depression at Sauble Beach on 26 July 2007. *Photo: Brendan Toews*

observed defending the juvenile plovers from persistent foxes and driving away a Merlin after another unsuccessful attack on the young. Later, all four plovers were observed bathing in the waves. One juvenile was observed running into the water and performing a barrel roll.

By 24 July, the juvenile plovers were flying well and foraging widely up and down the beach (seen as far away as 2.5 km south of the nest area). They were able to keep up with the male, and followed its lead in flying, bathing, foraging and resting. The male continued to vocalize alarm notes to warn them of possible predators.

The last day that the male and all three juvenile plovers were observed together was 26 July. They were all seen foraging along the creek, in the dunes, and on the beach.

The juveniles appeared to be much more independent, and were able to avoid gulls without any assistance from the male. All three juveniles were observed huddling together in a deep impression in the sand (Figure 19). At this point, the juvenile plovers were quite comfortable foraging along the beach in close proximity to people (Figure 20).

On 28 July, the male and one juvenile were observed on the beach, and

Figure 20. Juvenile Piping Plover (32 days old) at Sauble Beach on 26 July 2007.
Photo: Brendan Toews

then seen flying across the Sauble River. They were not seen for the remainder of the day. On 29 July, the male plover and one juvenile were last observed at 0840 hrs flying west over the breakwall at the Sauble River. Although observers were present until 2200 hrs, no plovers were found again. Likewise, no plovers were observed at Sauble Beach from 0645 – 1500 hrs on 30 July. A search by volunteers of beaches from Southampton to Oliphant failed to locate any Piping Plovers (Nutt 2007). As the nesting had come to its successful conclusion, a media event and volunteer appreciation dinner were hosted at the Sauble Beach Community Centre on 2 August by the Friends of Sauble Beach, to celebrate

the experience and thank all those who worked to help ensure the wonderful outcome.

Conclusion

This record represents the first nesting of the Piping Plover on the Canadian shore of the Great Lakes since 1977. It also marks the first nest record in Bruce County since 1972. This record also involves the only pair of Piping Plovers known to nest successfully anywhere in Ontario in 2007.

Few observers would have imagined that their spring and summer at Sauble Beach would be spent assisting an endangered bird species struggling to keep its place on the planet. The success of these birds was a tribute to both the great skill of the adult plovers and the excellent collaboration and leadership from the community, volunteer organizations and officials from three levels of government, all cooperating in a manner that was timely and unselfish. It was a tremendous success to have three fledged and healthy young result from this nesting. It is hoped that Piping Plovers will return to Sauble Beach in 2008 and help pioneer a return of this species to additional sites on Ontario's Great Lakes shores.

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Literature Cited

American Ornithologists' Union. 1945. Twentieth Supplement to the Check-list of North American Birds. Auk 62:436-449.

Bain, M. 1992. Ontario Bird Records Committee Report for 1991. Ontario Birds 10:43-63.

Bain, M. 1993. Ontario Bird Records Committee Report for 1992. Ontario Birds 11:46-63.

Bradstreet, M.S.W., G.W. Page and **W.G. Johnson.** 1977. Shorebirds at Long Point, Lake Erie, 1966-1971; seasonal occurrence, habitat preference, and variation in abundance. Canadian Field-Naturalist 91:225-236.

Cartar, R. 1976. The status of the Piping Plover at Long Point, Ontario, 1966-1974. Ontario Field Biologist 30:42-45.

Crins, W.J. 2003. Ontario Bird Records Committee Report for 2002. Ontario Birds 21:54-76.

Crins, W.J. 2005. Ontario Bird Records Committee Report for 2004. Ontario Birds 23:50-75.

Crins, W.J. 2007. Ontario Bird Records Committee Report for 2006. Ontario Birds 25:50-68.

Curry, R. 2006. Birds of Hamilton and surrounding areas. Hamilton Naturalists Club, Hamilton, Ontario.

Cuthbert, F.J. 2006. Summary of Great Lakes Piping Plover reproductive success, 1984-2005. University of Minnesota Great Lakes Piping Plover Research Program, Minneapolis-St. Paul, Minnesota.

Dobos, R.Z. 1997. Ontario Bird Records Committee Report for 1996. Ontario Birds 15:47-66.

Dobos, R.Z. 1999. Ontario Bird Records Committee Report for 1998. Ontario Birds 17:62-83.

Elliott-Smith, E. and **S.M. Haig**. 2004. Piping Plover (*Charadrius melodus*), The Birds of North America Online (A. Poole, Ed.). Ithaca, New York: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/002

Environment Canada. 2006. Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa, Ontario.

Ferland, C.L. and **S.M. Haig**. 2002. 2001 International Piping Plover census. United States Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon.

Haig, S.M. 1992. Piping Plover. *In* The Birds of North America, No. 2. (A. Poole, P. Stettenheim and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and the American Ornithologists' Union, Washington, D.C.

Haig, S.M. and **L.W. Oring**. 1987. Population studies of Piping Plovers at Lake of the Woods, Minnesota, 1982-1987. Loon 59:113-117.

Haig, S.M. and **L.W. Oring**. 1988. Distribution and dispersal in the Piping Plover. Auk 105:636-638.

Haig, S.M., C.L. Ferland, F.J. Cuthbert, J. Dingledine, J.P. Goossen, A. Hecht and **N. McPhillips**. 2005. A complete species census and evidence for regional declines in Piping Plovers. Journal of Wildlife Management 69:160-173.

Haws, K.V. 2005. Piping Plover and Common Tern investigations, Lake of the Woods, 2003-2004. Minnesota Department of Natural Resources. Bemidji, Minnesota.

Heyens, L.E. 2005. Ontario report. Piping Plover Recovery Team. *Charadrius melodus circumcinctus.* Unpublished Ontario Ministry of Natural Resources report. Kenora, Ontario.

Heyens, L.E. 2007. Piping Plover, pp. 214-215 *in* Atlas of the Breeding Birds of Ontario, 2001-2005. (Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier, eds.). Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario.

Hussell, D.J.T. 1980. The last of the Piping Plovers? Long Point Bird Observatory Newsletter 12(2):1-2.

Hussell, D.J.T. and **R.D. Montgomerie**. 1966. The status of the Piping Plover at Long Point, 1960-1965. Ontario Field Biologist 20:14-16.

Jackson, J. 2005. Summary of Piping Plover survey results and management practices for Wasaga Beach Provincial Park. Ontario Ministry of Natural Resources, Ontario Parks.

Lambert, A.B. 1987. Piping Plover, pp. 162-163 *in* Atlas of the Breeding Birds of Ontario (Cadman, M.D., P.F.J. Eagles and F.M. Helleiner, eds.). Federation of Ontario Naturalists and the Long Point Bird Observatory, University of Waterloo Press, Waterloo, Ontario.

Lambert, A.B. and **E. Nol**. 1978. Status of the Piping Plover at Long Point. Long Point Bird Observatory, Port Rowan, Ontario.

Ludwig, J.P. 1974. Recent changes in the Ring-billed Gull population and biology in the Laurentian Great Lakes. Auk 91:575-594.

McCracken, J.D., M.S.W. Bradstreet and **G.L. Holroyd**. 1981. Breeding birds of Long Point, Lake Erie: a study in community succession. Canadian Wildlife Service Report Series, Number 44, Ottawa, Ontario.

Miller, G.W. 1977. The current status and breeding performance of the Long Point Piping Plovers — a survey of an endangered species population. Unpublished report. Long Point Bird Observatory, Port Rowan, Ontario.

Moser, R.A. 1942. Should the Belted Piping Plover be recognized as a valid race? Nebraska Bird Review 10:31-37.

Nutt, S. 2007. The Piping Plover Project Report. Unpublished report prepared for the Canadian Wildlife Service and Ontario Ministry of Natural Resources, Sauble Beach, Ontario.

Price, E.W. 2002. Piping Plover recolonization potential in the Great Lakes: assessment of historic habitat and dispersal events. M.Sc. thesis, University of Minnesota, Minneapolis-St. Paul, Minnesota.

Richardson, I.M. 1997. Guidelines for the use of predator exclosures to protect Piping Plover (*Charadrius melodus*) nests. Wildlife Management Division, Alberta Environmental Protection, Edmonton, Alberta.

Roy, K.J. 2001. Ontario Bird Records Committee Report for 2000. Ontario Birds 19:45-64.

Russell, R. 1983. The Piping Plover in the Great Lakes region. American Birds 37:951-955.

Sauer, J.R., J.E. Hines and **J. Fallon.** 2003. The North American Breeding Bird Survey, results and analysis, 1966-2002. Version 2003.1. Patuxent Wildlife Research Center, United States Geological Survey, Laurel, Maryland.

Sheppard, R.W. 1935. Mid-summer bird notes from Long Point, Norfolk County, Ontario. Auk 52:196-197.

Schmelzeisen, R. and **L. Engley**. 2003. Alberta Piping Plover predator exclosure and population monitoring program. Unpublished report. Alberta Conservation Association, Edmonton, Alberta.

Snyder, L.L. and **E.B.S. Logier** (Eds.). 1931. A faunal investigation of Long Point and vicinity, Norfolk County, Ontario. Transactions of the Royal Canadian Institute 18:117-236.

Stucker, J.H. and **F.J. Cuthbert.** 2006. Distribution of non-breeding Great Lakes Piping Plovers along Atlantic and Gulf of Mexico Coastlines: 10 years of band resightings. United States Fish and Wildlife Service, East Lansing, Michigan, Panama City, Florida.

Wemmer, L.C., U. Ozesmi and **F.J. Cuthbert**. 2001. A habitat based population model for the Great Lakes population of Piping Plover (*Charadrius melodus*). Biological Conservation. 99:169-181.

Wiens, T.P. and **F.J. Cuthbert**. 1984. Status and reproductive success of the Piping Plover in Lake of the Woods. Loon 56:106-109.

Wiens, T.P. and **F.J. Cuthbert**. 1988. Nest site tenacity and mate retention of the Piping Plover. Wilson Bulletin 100:545-553.

Wormington, A. 1987. Ontario Bird Records Committee Report for 1986. Ontario Birds 5:42-63.

Wormington, A. and **R.H. Curry.** 1990. Ontario Bird Records Committee Report for 1989. Ontario Birds 8:4-33.

Worthington, D. 2002. Greater Toronto Area bird records. Toronto Ornithological Club Newsletter 127:4-14.

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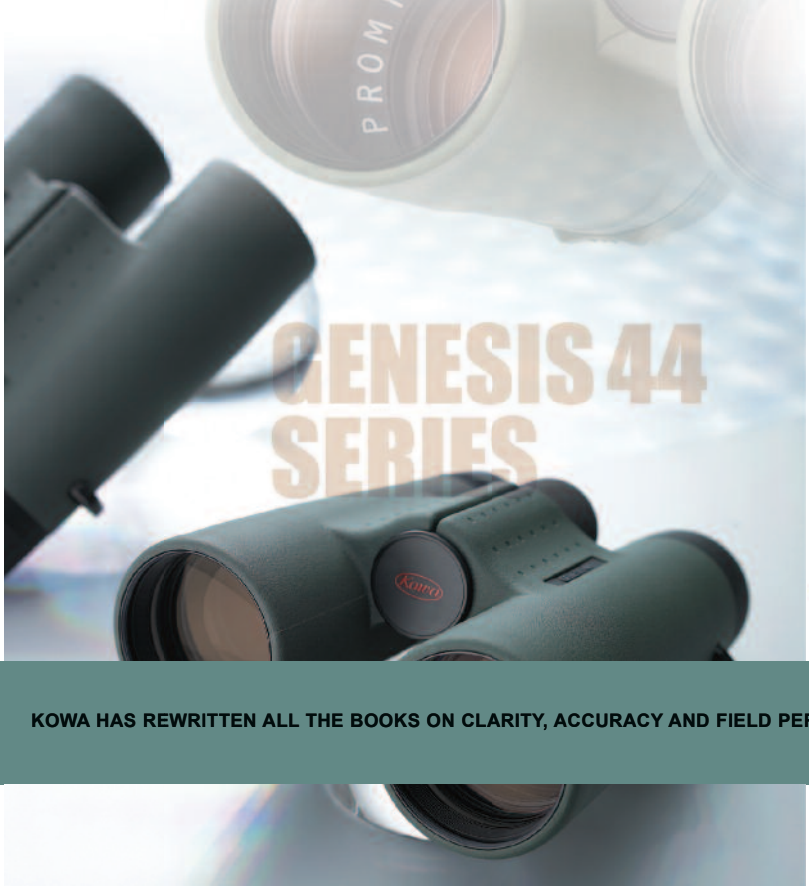

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Manx Shearwaters on the Great Lakes

Robert Curry and Bruce Di Labio

There are now four records of Manx Shearwater (*Puffinus puffinus*) from the lower Great Lakes or adjacent water bodies and land areas. This paper will discuss in detail observations of the bird at Hamilton in 2006. It will also summarize what is known about the other three records and speculate about their origins.

Armada, Michigan, 19 August 2000

The first Manx Shearwater for the Great Lakes was found in emaciated condition on a lawn. Armada is in Macomb County in the southeastern part of Michigan, due north of Windsor, Ontario, and southwest of Sarnia (Brewer 2003, Chartier 2000).

Apart from the fact that this bird most probably passed through Ontario, the most intriguing fact is that it was banded as a nestling on Copeland Island, County Down, Northern Ireland, on 7 September 1991. When found it was nine years old (Brewer 2003).

Ottawa, Ontario, 26 August 2001

On 26 August 2001, while walking along the Shirley's Bay dyke west of Ottawa along the Ottawa River, Bruce Squirrel noticed a black and white bird floating in the water (Di Labio 2001). Noting it looked unusual for a gull, he retrieved the bird. It was in excellent condition and appeared to have just recently expired. The specimen was put in a freezer and Di Labio was contacted, through Peter Dunn of Ottawa, about this unusual specimen. On 9 September 2001, Di Labio picked up the specimen and later took it to the Canadian Museum of Nature where he and Michel Gosselin confirmed the

Figure 1: Manx Shearwater found dead at Shirleys Bay, Ottawa, 26 August 2001.
Photo: Bruce DiLabio

identification. Photographs were taken (Figure 1) and Di Labio prepared the bird as a study skin (specimen number CMNAV 77920). The shearwater was emaciated, weighing only 248.6 grams, and its stomach was empty. Average weight of healthy female individuals ranges from 375 to 447 grams (Cramp and Simmons, 1977). Sex was a female; ovaries measured 10 mm X 4 mm. The feathers were in relatively good shape and there was no unusual wear. The record was accepted by the Ontario Bird Record Committee as the first record for Ontario (Roy 2002)

Hamilton, Ontario, (Van Wagners Beach) 31 August – 1 September 2006

Lake watchers at the western end of Lake Ontario have established that among the best periods to watch for Canadian Arctic birds on passage to their wintering grounds on southern oceans are at the end of August and the first 10 days of September. Conditions at the end of August 2006 were particularly ideal when a nine-day period of strong northeast winds caused birds on the lake to drift to the western end. Barry Cherriere and others began a daily vigil on 24 August (Cherriere 2007).

On 31 August, the seventh day of such favourable winds, observers tallied numbers of Parasitic Jaegers (*Stercorarius parasiticus*). At 1400h, Cherriere was stunned to observe the characteristic stiff-winged roller coaster flight of an apparent shearwater as it flew through the field of view of his spotting scope from left to right; five others were present and observed the bird at this time. Using Harrison (1983) they identified the bird as a Manx Shearwater. They observed the bird flying by out in

Figure 2: Manx Shearwater at Van Wagners Beach, Hamilton, 31 August 2006, showing black upperparts. *Photo: Barry S. Cherriere*

Figure 3: Manx Shearwater at Van Wagners Beach, 31 August 2006. Note all white undertail coverts and very black upperparts. *Photo: Barry S. Cherriere*

Figure 4: Manx Shearwater at Van Wagners Beach, 31 August 2006, commencing descent from high, arching glide. *Photo: Barry S. Cherriere*

the lake several more times over the next hour or so. However, as birders began to gather, the bird was not being seen. Fortunately, at 1830h, the gathered group was treated with two "fly-bys". The shearwater flew past from east to west at an estimated distance of 200 m then, presumably finding itself cut off by the end of the lake, returned from west to east at a distance of approximately 400 m. On this second pass Cherriere obtained photographs (Figures 2 – 4).

The following morning, 1 September, a much larger group of happy birders managed to see the Manx Shearwater. Unfortunately, after about 0900h the bird disappeared, although in the late afternoon a few watchers managed to observe it farther out in the lake. This was the last observation of the Manx Shearwater at Hamilton.

Only a few similar shearwaters are small, dark above and white below. Three that occur in the northwestern North Atlantic are the Audubon's (*P. lherminieri*), Little (*P. assimilis)* and Manx Shearwaters (Dunn and Alderfer 2006, Post 1967).The Manx Shearwater is by far the most likely of these three to be seen inland. Audubon's is a warm-water species and is a postbreeding inhabitant of the Gulf Stream, occurring rarely as far north as Canadian Atlantic waters (Godfrey 1986). There is one Ontario record of Audubon's Shearwater — of a bird found dead at Almonte, *Lanark*, on 8 September 1975 (Godfrey 1976, 1986). This bird's

arrival so far inland probably resulted from Hurricane Caroline, a category 3 storm, when it made landfall in western Florida, and which dissipated into a tropical depression on 1 September in eastern Kentucky (Wormington 2008). The Little Shearwater breeds on islands in the eastern Atlantic and is a vagrant to the western Atlantic. The Manx Shearwater, on the other hand, has changed drastically in status on this side of the Atlantic, and is discussed later.

Observations and photographs of the Hamilton bird illustrate the diagnostic features of Manx Shearwater and clearly eliminate Audubon's and Little Shearwaters. Manx is noticeably longer-winged than the other two, and is the only one that habitually soars high above the water, interspersed with long glides in a rolling fashion. The long-winged shape, pointed primaries and soaring behavior, were carefully noted by observers at Van Wagners Beach, and are apparent in the photographs. It was uniformly black on the entire upper-parts. It was gleaming white on the under-parts, including white wing linings, and had white undertail-coverts. The leading and trailing edges of the wings were black, as were the undersides of the outer primaries. It was difficult under the conditions of observation to note the exact pattern of the head, except to note that the crown was dark and this black extended down to the eye and onto the sides of the neck. Little Shearwater is a small, short-winged species that flies close to the water with a more laboured flight. Audubon's Shearwater is proportionately shorter and rounder winged, has dark brown upperparts and dusky undertail coverts, and does not normally tower in flight.

Derby Hill, New York, 23 October 2006

On this date, Bill Purcell and Dave Wheeler watched a Manx Shearwater flying west into the wind off Derby Hill at the southeast end of Lake Ontario (Iron and Pittaway 2006, Veit and Paxton 2007). They observed the salient features and their description appears to clearly eliminate Audubon's Shearwater. They submitted a report to the New York State Avian Records Committee but it had not been reviewed at the time of writing this paper (Jean Skelly, pers. comm.).

The only other inland record of Manx Shearwater in North America was one observed, on 30 May 2004, by a birding tour group at Ninepipe National Wildlife Refuge Reservoir in western Montana (Holt *et al.* 2007). Unlike the Great Lakes birds, this shearwater likely originated in the North Pacific, where since the first report in 1975, The Manx Shearwater has increased dramatically up to the present time; now about 15 are found annually (Mlodinow 2004). Also, unlike the Great Lakes birds, the Manx Shearwater in Montana must have crossed a considerable extent of land, including mountains, to arrive at the observation point.

Status and Origin of Great Lakes Manx Shearwaters

The majority of Manx Shearwaters breed in the eastern Atlantic, mostly in the United Kingdom and Ireland, but also on islands off the coast of Europe and Africa (Lee 1999). The world population is estimated to be 340,000 – 410,000 pairs (Mitchell *et al.* 2004). The bulk of the population undertakes a long and rapid trans-equatorial migration to the South Atlantic and overwinters off the east coast of South America, although a few remain in Northern Atlantic waters (Lee 1999).

In the western Atlantic, there were a few reports and specimens of Manx Shearwater beginning with 1833, when Audubon claimed to have obtained a specimen to the west of Newfoundland (Post 1967). The species is known to have bred three times in Bermuda, but not after 1905 (Lee 1999). Beginning in the 1950s Manx Shearwater was reported regularly from North American waters. The first North American nest was found on Penikese Island, Massachusetts, in 1973 (Bierregaard *et al.* 1975). Manx Shearwaters were first found nesting on Middle Lawn Island, off the Burin Peninsula in southern Newfoundland, in 1977 (Storey and Lien 1985). They continue to nest there. Numbers in waters off the east coast of Canada and the United States have increased dramatically since the 1970s (Mlodinow 2004).

Manx Shearwater has a preference for the shallower waters of the continental shelf and now is the commonest shearwater found in inshore waters of Nova Scotia (Lee and Haney 1996). For example, Di Labio *et al.* (unpubl. data) counted more than 100 Manx Shearwaters, on 31 August 2001, in the Bay of Fundy off Grand Manan Island. It is by far the most common shearwater in the St. Lawrence estuary with at least 25 records west of Matane, Quebec (M. Gosselin pers. comm.). There are at least two records as far upriver as Quebec City (31 July 1984, 20 August 2006), and one was reported near Sherbrooke, on 20 August 1993 (M. Gosselin, pers. comm.).

The large numbers of Manx Shearwaters off Canada's east coast are not all breeding in Canada. Some nonbreeding adults and juveniles from the European colonies spend the summer in North American waters and others may visit northwest Atlantic feeding grounds before migrating to the South Atlantic. The Michigan bird, although originally banded in Northern Ireland, may have already been over the Canadian continental shelf before it moved inland

Note the tight grouping of three of these records; they occurred in a space of 13 days, 19 August – 31 August, and also all three in the span of seven years between 2000 and 2006. Nonbreeding adult Manx Shearwaters and juveniles depart their North Atlantic breeding grounds in July – August, followed by

breeding adults in August – September (Lee and Haney 1996). Almost certainly all these Great Lakes Manx Shearwaters flew up the St. Lawrence River, perhaps as they wandered prior to southward migration (Iron and Pittaway 2006). There is no evidence to suggest that their arrival inland was weather related, i.e. hurricanes.

The increasing numbers of Manx Shearwaters in the St. Lawrence estuary suggest this species may become a more frequent vagrant to the Great Lakes region.

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Literature Cited

Bierregaard, R.O. Jr., **A.B. David, II**, **T.D. Baird** and **R.E. Woodruff** .1975. First northwestern Atlantic breeding record of the Manx Shearwater. Auk 92:145–147.

Brewer, D. 2003. Manx Shearwater: The possible first Ontario record? Ontario Birds 21:98–99.

Chartier, A.T. 2000. Manx Shearwater in Michigan. Bird Banders Forum, 25 August 2000. Available online at http://listserv.arizona.edu/cgi-bin/wa?A2=ind0008d&L=birdband&T=0&P=2340

Cherriere, B. 2007. Manx Shearwater found in Hamilton! The Wood Duck 60:172–173.

Cramp, S. and **K. E. L. Simmons** (editors). 1977. The Birds of the Western Palearctic: Handbook of the Birds of Europe, the Middle East, and North Africa. Volume 1: Ostrich to Ducks. Oxford University Press, London.

Dunn, J.L. and **J. Alderfer** (editors). 2006. National Geographic Field Guide to the Birds of North America. National Geographic Society, Washington D.C.

Di Labio, B. 2001. Anything is Possible!: Specimen record of Manx Shearwater for Ontario : Ontario Birding News 6:4.

Godfrey, W.E. 1976. Audubon's Shearwater, a species new for Canada. Canadian Field-Naturalist 90:494.

Godfrey, W.E. 1986. The Birds of Canada, Revised Edition. National Museum of Natural Sciences, Ottawa.

Harrison, P. 1983. Seabirds an Identification Guide. Houghton Mifflin, Boston.

Holt, D.W., B. Mulrooney and **J.M. White**. 2007. A Manx Shearwater (*Puffinus puffinus*) from Montana. Northwest Naturalist 88:14–16.

Iron, J. and **R. Pittaway**. 2006. Another Manx Shearwater on Lake Ontario. Ontbirds Listserv 24 October 2006.

Lee, D.S. 1999. A closer look: Manx Shearwater. Birding 31:526-531.

Lee, D.S. and **J.C. Haney.** 1996. Manx Shearwater (*Puffinus puffinus*). *In* the Birds of North America, No. 257 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, Pennsylvania, and The American Ornithologists' Union, Washington D.C.

Mitchell, P.I., **S.F. Newton**, **N. Ratcliff** and **T.E. Dunn**. 2004. Seabird Populations of Britain and Ireland. T & A.D. Poyser, London.

Mlodinow, S.G. 2004. Manx Shearwaters in the north Pacific Ocean. Birding 36:608–615.

Post, P.W. 1967. Manx, Audubon's and Little Shearwaters in the northwestern North Atlantic. Journal of Field Ornithology 38:278–305.

Roy, K.J. 2002. Ontario Bird Records Committee report for 2001. Ontario Birds 20:54–74.

Storey, A.E. and **J. Lien**. 1985. Development of the first North American colony of Manx Shearwaters. Auk 102:395–401.

Veit, R.R. and **R.O. Paxton**. 2007. Hudson-Delaware. North American Birds 61:42–46.

Wormington, A. 2008. The Rare Birds of Ontario: A catalogue of distributional records. Unpublished manuscript.

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Another Leucistic Bird: Common Goldeneye

Barry Cherriere

Figure 1. A leucistic female Common Goldeneye, 8 December 2001, Stony Creek, Niagara R.M.
Photo: Barry Cherriere

Further to the five leucistic birds mentioned in the December 2007 Ontario Birds (25:115-120), a leucistic female Common Goldeneye (*Bucephala clangula*) was sighted on 8 December 2001, at the end of Grays Road, in Stony Creek, Niagara Region. It was with a mixed flock of hundreds of other wintering ducks, and almost never came close to my position. The distant photo (Figure 1) illustrates a very pale looking bird; the head was almost white, but with a dark bill, the wings were a very light gray and white; the back feathering was dappled medium and light gray. The most noticable loss of pigment was in the melanins contributing to the black of the wings and the brown of the head.

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Use of Black Alder (*Alnus glutinosa*) by Birds in Southern Ontario

Kenneth W. Dance

Introduction

Black Alder is a tree which was introduced into Southern Ontario, by European settlers, 200 or more years ago. The original range of this tree includes Great Britain and western and central Europe. In Ontario, Black Alder is considered to be an aggressive exotic species that can dominate a site to exclude all other plant species and remain dominant on the site indefinitely. It is also considered to be a top priority species for control (Urban Forest Associates Inc. 2002).

This tree has been planted at Hanlan's Point on Toronto Island and has been collected in Haldimand-Norfolk, Elgin and Oxford Counties (Soper and Heimburger 1982). The author has observed it growing in Halton and Waterloo Regions and Brant, Elgin, Norfolk and Oxford Counties. This tree has been planted, spread and has naturalized in eastern North America, from Illinois to Massachusetts, and south to New Jersey (More and White 2002). Lauriault (1989) indicates that Black Alder was originally introduced in Canada for the production of charcoal.

The Black Alder can grow into a tree up to 20 m or more in height. In Ontario, the largest Black Alder listed on the Ontario Honour Roll of Trees was 18.4 m tall and 72 cm diameter, measured 1.3 m above the ground (Ontario Forestry Association undated). As with the native alder species, Black Alder seeds are produced in a woody, cone-like catkin which persists after the seeds are shed in late autumn or winter.

The author has observed that Black Alder trees produce thousands of seeds which float on water. McVean (1953) reports that the average number of seeds produced by a Black Alder is 240,000, and that the seeds float for 30 days. This trait aids downstream distribution of seeds of this tree, which thrives in lowland habitats: wetlands, stream, river and lake shores.

There are two native species of alder in Ontario, Speckled Alder, *Alnus incana* spp. *rugosa*, and Green Alder, *Alnus viridis* spp. *crispa*. These are both shrubby species. Speckled Alder is present throughout Ontario, except near the western end of Lake Erie. The Green Alder is distributed across Northern Ontario, but is rare south of 46° N and is absent south of the Canadian Shield. Both species occur across Eurasia (Soper and Heimburger 1982).

Several bird species are known to consume buds, catkins and /or seeds of the native alder species e.g. Ruffed Grouse (*Bonasa umbellus*), American Woodcock (*Scolopax minor*), Common Redpoll (*Carduelis flammea*), Hoary Redpoll (*C. hornemanni)*, Pine Siskin (*C. pinus*) and American Goldfinch (*C. tristis*) (Martin *et al.* 1951). There are only scattered reports of birds using Black Alder in North America e.g. the Pine Grosbeak (*Pinicola enucleator*) was reported to consume Black Alder seeds (Bent 1968).

Birds attracted to the Black Alder in North America include: Great Blue Heron (*Ardea herodias*), Pine Siskin, American Goldfinch, Scarlet Tanager (*Piranga olivacea*), Blue Jay (*Cyanocitta cristata*), grosbeaks, sapsuckers and warblers. Seeds, insects on leaves, shelter, nesting sites and sap are listed as uses of the Black Alder by birds (The Morton Arboretum 2002). A study of birds in north-central Saskatchewan found that the Red-eyed Vireo (*Vireo olivaceus*) was associated with the shrubby Black Alder habitat present in the stands studied (Kirk and Hobson 2001).

The only detailed reference to Black Alder use by birds in Ontario that I have encountered was reported in (Olbermann and Gordon undated). Black Alder was one of nine or more tree and shrub species planted to widen the treed buffer along a stream located in Oxford County, Ontario. Followup bird surveys revealed that the number of bird species nesting and foraging in the rehabilitated areas was greater than in the control area. An autumn season survey revealed higher numbers of Blue Jay, Song Sparrow (*Melospiza melodia*), Black-capped Chickadee (*Poecile atricapillus*), Cedar Waxwing (*Bombycilla cedrorum)* and Yellow-rumped Warbler (*Dendroica coronata*) present in a wide buffer planting than were present in the narrow buffer and control areas.

The purpose of the present paper is to document the magnitude of use by birds of a tree which has been present in the southern Ontario landscape for approximately two centuries.

Methods

Detailed notes were kept of the species, numbers, uses and behaviour of birds observed on or immediately adjacent to Black Alder trees.

The observation period ranged between 5 January 2003 and 25 October 2007. Specific use(s) by birds were observed during 163 trips.

More than ninety-five percent of the observations were recorded in the Nith

River valley at Wolverton, Blandford-Blenheim Township, Oxford County. Many observations were near the confluence of Wolverton Creek (a coldwater stream) and the Nith River (17T 538500 4790100 NAD 1983). Black Alder trees line the banks of both Wolverton Creek and portions of the Nith River in this location.

Less frequently, observations were recorded at Glen Morris, Brant County; Otterville, Oxford County; Port Burwell, Elgin County and Blair, Regional Municipality of Waterloo.

Results

Tables 1 through 4 contain a summary of the number of observations of various uses of Black Alder arranged by bird species. Black Alder seeds were observed to be consumed by eight bird species (Table 1). Six bird species were observed to be foraging on or within the boles or snags of Black Alder trees (Table 2). Twenty-seven bird species were recorded foraging for insects on the leaves, twigs and/or branches of Black Alder, (Table 3). Table 4 indicates that 42 species were observed using Black Alder as a foraging perch (e.g. by insectivores which sally out to capture prey), a resting or preening perch, for cover and/or as nest sites.

Table 1. Number of Observations of Black Alder Seed Consumption by Bird Species.

Species	Number of observations
Black-capped Chickadee	16
American Tree Sparrow	2
Dark-eyed Junco	5
House Finch	1
White-winged Crossbill	1
Common Redpoll	1
Pine Siskin	22
American Goldfinch	52

Table 2. Number of Observations of Foraging on Black Alder Boles or Snags by Bird Species.

Species	Number of observations
Downy Woodpecker	20
Hairy Woodpecker	2
Pileated Woodpecker	2
White-breasted Nuthatch	10
Brown Creeper	15
Carolina Wren	1

Discussion

Finches, sparrows and Black-capped Chickadees were observed consuming Black Alder seeds (Table 1). The American Goldfinch and Pine Siskin were observed most frequently extracting seeds from the Black Alder cones. Mixed flocks of these two species were frequently observed, with flock sizes reaching up to an estimated 300 individuals. Although the observation dates are not reported here in detail, a review of my notes indicates that seed availability and consumption was concentrated

between the end of October and mid-April, with December through late March being the most intensive season of seed consumption.

As noted earlier, several of the bird species listed in Table 1 are known to consume seed of the native alder species also, e.g. American Goldfinch, Common and Hoary Redpoll and Pine Siskin (Martin *et al.* 1951). Root (1988) described alder (species unspecified) seed use by the American Goldfinch. Root also indicates that goldfinches can be members of mixed species flocks containing redpolls, siskins and American Tree Sparrows (*Spizella arborea*).

For those bird species which feed on Black Alder seeds it is an important phenomenon that, although the quantity of seed produced has been found to vary from year to year, both in Europe and the eastern United States, seed crops are generally heavy (McVean 1955, Pizelle 1984).

Table 2 reveals that species such as the Downy Woodpecker (*Picoides pubescens*) and Brown Creeper (*Certhia americana*) forage on, or in, the boles or snags of Black Alder. It was observed that many of the bole/snag foragers were members of mixed flocks, including the Black-capped Chickadee and

Table 3. Number of Observations of Foraging for Insects on Black Alder Leaves, Twigs and/or Branches by Bird Species

Species	Number of observations		
Blue-headed Vireo	2	Yellow-rumped Warbler	7
Warbling Vireo	3	Black-throated Green Warbler	1
Philadelphia Vireo	1	Palm Warbler	1
Red-eyed Vireo	1	Bay-breasted Warbler	1
Black-capped Chickadee	56	American Redstart	2
Winter Wren	1	Mourning Warbler	1
Golden-crowned Kinglet	7	Common Yellowthroat	1
Ruby-crowned Kinglet	10	Song Sparrow	1
Blue-gray Gnatcatcher	1	White-throated Sparrow	4
Gray Catbird	1	Rose-breasted Grosbeak	1
Yellow Warbler	8	Red-winged Blackbird	3
Chestnut-sided Warbler	1	Common Grackle	2
Cape May Warbler	1	Baltimore Oriole	1
		American Goldfinch	3

kinglets, which moved through and foraged on Black Alder patches together. Table 3 documents the considerable variety of insectivores which were observed foraging on Black Alder leaves, twigs and branches. Vireo, warbler, kinglet and sparrow species, among others, were recorded. Insect taxa observed to be among the prey items included Lepidoptera (moths and butterflies) adults and larvae, adult Plecoptera (stoneflies) and adult Chironomidae (midge flies). Since the alders grow adjacent to or hang over Wolverton Creek and the Nith River, it is not surprising that an abundance of recently emerged aquatic insects is present on these trees.

Black Alder leaves persist on the tree well into November, and insects present among the leaves were frequently gleaned by autumn migrating kinglets. Many of the vireo and warbler species observations with low occurrence numbers were spring migrants feeding on early emerging Chironomids. Insects from Black Alders were also used by autumn migrants. The Black-capped Chickadee was observed most frequently gleaning insects from Black Alder leaves, twigs or branches (56 occasions). This resident species was observed gleaning on Black Alder every month of the year except August.

On many dates, Black-capped Chickadees appeared to be the leaders of mixed species flocks which foraged among the Black Alders, with winter birds and/or migrants joining these flocks. Examples of mixed flock observations included 5 January 2003, when a flock of Black-capped Chickadee, American Tree Sparrow and American Goldfinch was consuming seeds. On 27 September 2003, a mixed flock including Black-capped Chickadee, White-breasted Nuthatch (*Sitta carolinensis*), Gray Catbird (*Dumetella carolinensis*), Bay-breasted Warbler (*Dendroica castanea*) and White-throated Sparrow *(Zonotrichia albicollis*) was observed. All of these species were gleaning insects from Black Alder trees.

Forty-two bird species were recorded making other uses of Black Alder (Table 4). A variety of duck species was observed feeding and loafing in areas where the tree cover on the adjacent bank was Black Alder. The raptor species observed were either hunting and/or perching in areas where Black Alder was the predominant tree cover.

A great variety of resident song bird species was observed perching in Black Alder. The trees provided cover and several species were observed sallying out from alders to capture insects. A number of other species was observed moving from Black Alder cover to adjacent food sources such as Wild Cucumber (*Echinocystis lobata*), Giant Ragweed (*Ambrosia trifida*) and Riverbank Grape (*Vitis riparia*). Several species, e.g. Black-capped Chickadee and Red-winged Blackbird (*Agelaius phoeniceus*), took Giant Ragweed seeds back to Black Alder branches for "processing" and consumption.

Table 4. Number of Observations of Other Uses* of Black Alder by Bird Species

Species	Number of observations of uses
Canada Goose	C (5)
Wood Duck	C (2)
American Black Duck	C (4)
Mallard	C (1)
Common Merganser	C (6)
Wild Turkey	C (2)
Great Blue Heron	P (1)
Turkey Vulture	P (1)
Osprey	P (1), F (1)
Bald Eagle	F (1)
Red-tailed Hawk	P (1), F (1)
American Woodcock	C (1)
Mourning Dove	P (2)
Ruby-throated Hummingbird	P (1)
Belted Kingfisher	P (1)
Red-bellied Woodpecker	P (1)
Least Flycatcher	P (3)
Eastern Phoebe	P (7),F (1)
Blue Jay	P (6)
American Crow	P (4)
Tree Swallow	P (1)
Barn Swallow	P (1)
Black-capped Chickadee	P (11), N (1)
Winter Wren	C (1)
American Robin	P (9), N (2)
Gray Catbird	P (1)
European Starling	P (1)
Cedar Waxwing	P (7), F (1)
Yellow Warbler	P (3), N (2)
Common Yellowthroat	P (3)
Song Sparrow	P (9)
White-throated Sparrow	P (5)
Dark-eyed Junco	P (4)
Northern Cardinal	P (6)
Rose-breasted Grosbeak	P (4)
Red-winged Blackbird	P (13)
Common Grackle	P (5)
Brown-headed Cowbird	P (2)
Baltimore Oriole	N (1)
Purple Finch	P (1)
Pine Siskin	P (1)
American Goldfinch	P (5), N (1)

Legend

- Other uses include: foraging territory (F), perching (P), provision of cover (C), nest sites (N).
- Number in brackets indicates number of observations of each use type.

Black Alder trees or snags were used as nest sites by Black-capped Chickadee, American Robin (*Turdus migratorius*), Yellow Warbler (*Dendroica petechia*), Baltimore Oriole (*Icterus galbula*) and American Goldfinch. In Europe, a variety of bird species have been documented to nest in cavities located in Black Alder trees. Wesolowski (1995) found that in an eastern Polish forest, bird nest cavities were more abundant in Black Alder than in five other tree species studied. All six tree species hosted some nest cavities. The bird taxa using the cavities in trees studied included tit species (*Parus*), flycatchers species (*Ficedula*), a nuthatch, European Starling (*Sturnus vulgaris*) and the Great Spotted Woodpecker (*Dendrocopos major*). Of the nest cavities present in the Black Alders, 8.5% were subsequently lost due to injury compartmentalization (wounds sealed over by tree tissue growth).

In Scotland, the Common Goldeneye (*Bucephala clangula*) and Gray Wagtail (*Motacilla cinerea*) were reported to nest in old stands of Black Alder where these bird species sought holes to nest in (Wild Scotland 2006). Stanevicius and Balevicius (2005) found Black Alder sticks in nests of Marsh Harrier (*Circus aeruginosis*) at three sites located in Lithuania.

Additional observation effort during the breeding season in Southern Ontario would undoubtedly confirm nesting of more bird species in Black Alders.

Charcteristics of Black Alder of Benefit to Birds

Seed Production and Availability

The abundant and reliable seed production provides a food source during the late autumn through early spring period. Since seeds are held in cones, this food source is protected from snow until the seeds are eaten or fall out of the cone. Dark-eyed Juncos (*Junco hyemalis*) were observed foraging on seeds which had fallen onto snow. One example of interesting seed foraging behaviour was an observation, on 19 November 2005, involving a single American Tree Sparrow flying to several groups of twigs that had seed catkins attached, landing on the twigs and shaking the seed cones by quivering its body. I did not, however, observe the Tree Sparrow retrieving any seeds, which would have been shaken loose. This type of behaviour, involving seeds knocked from birch catkins, has been described for Common Redpolls (Brooks 1978).

Since Black Alder seeds float, they continue to be a food source when deposited among flood debris. American Goldfinches were observed feeding on windrows of seeds deposited on logs as melt water receded, on 24 March 2003.

Nutrient Value of Catkins

Martin *et al.* (1951) reported that nutrient content of the catkins from an unspecified alder species was 8% protein, 7% fat and 25% sugar and starch.

The values for alder catkins were all greater than those for cauliflower (*Brassica oleracea* var. *botrytis*). Ruffed Grouse are known to consume alder catkins.

Physical Structure of the Tree

The layered and relatively dense structure of the branches, twigs and leaves, and long seasonal persistence of leaves, creates several "benefits" for birds. Cover from predators is provided. Surfaces available for insect colonization are extensive, but are open enough for birds to forage. Black-capped Chickadees and Downy Woodpeckers present in an oak-hickory forest during winter were found to concentrate foraging on small live branches and twigs (Brawn *et al.*, 1982). The structure of Black Alder provides an abundance of small branches and twigs. The present study found (Table 3) that the Black-capped Chickadee was frequently observed on Black Alder leaves, twigs and /or branches.

Robinson and Holmes (1984) studied a northern deciduous forest where native alders were an acknowledged component of the "multilayered" leaf distribution of successional tree species. Several vireo and wood warbler species were studied. These authors found that the different ways that forest birds searched for and captured prey appeared to be influenced by the arrangement of leaves, branching patterns and other parameters of foliage structure. The dense leaf and twig structure of Black Alder hanging over Wolverton Creek and the Nith River attracted insects which provided food for a variety of migrant vireo, warbler and sparrow species, among others. The migrant vireo and warbler species would be familiar with native alder species present in the breeding range of many of these birds.

The fissured bark of larger diameter Black Alders provides cover for insects and other arthropods which attracted a variety of resident and migrant bark gleaning bird species. Downy Woodpecker, Brown Creeper and White-breasted Nuthatch were most frequently observed gleaning on boles.

The persistence of Black Alder leaves on trees into mid- and late-November provides cover when most other trees have lost their leaves, a foraging substrate which is used by Black-capped Chickadees and other leaf gleaners.

Examination of a sample of Black Alder cones in March of 2004 and 2005 revealed that seeds were still present. The availability of this food source throughout the entire winter is important and has been commented on by others. Dunn and Tessaglia-Hymes (1990) indicate that alder (species unspecified) seeds play an important role in the winter diets of redpolls, Pine Siskins and American Goldfinch. According to these authors, American Goldfinches rely on weed seeds until snow covers these sources, then alder and birch seeds, which are suspended high above the ground, become important.

The tops of mature Black Alders frequently break off, leaving snags that were observed to be used as perches by a variety of large birds, as foraging sites for birds seeking wood-boring insects, and as nest sites by Black-capped Chickadees.

Other Roles of Black Alder

From a broader ecological perspective, Black Alders assist in the restoration of poor quality soils by fixing nitrogen, and by stabilizing stream and river margins through the rapid colonization of eroding and slumping banks. The root systems and dense stem structure of Black Alder saplings reduce the erosive forces of flood waters.

The distribution of Black Alder in the landscape is usually clumped or linear, being associated with moist soils. In the present study area (the valleys of streams and rivers that flow south into Lake Erie), Black Alder is concentrated along known bird migration routes and bird overwintering habitats. The tree species, thus, plays a significant role in the provision of food and cover to migrating and overwintering birds.

Beneficial Role of Birds for the Black Alder

There is evidence that birds play a role in dispersing the seeds of Black Alder. Perhaps the most interesting finding in this regard is the conclusion that birds may have played a significant role in dispersing Black Alder seed from western France to the British Isles several thousand years ago (Chambers and Elliott 1989).

Summary

Over a period of two hundred years or more, dozens of bird species have adapted to using the introduced Black Alder tree for food and cover in Southern Ontario. Seed consumption by winter flocks of several hundred American Goldfinch and Pine Siskin is one major use which is documented here. Insectivores forage extensively among Black Alders during the spring and autumn migrations. Dozens of bird species were observed using the Black Alder as a preening, singing or resting perch. Five breeding bird species were observed nesting in Black Alder trees or snags.

A number of physical characteristics of the Black Alder seem to affect its benefits for birds. The occurrence of Black Alder in stream and river valleys that are key migration and overwintering habitats contributes to this tree's strategic role in bird ecology. Birds in turn benefit the tree by dispersing the seeds of Black Alder following consumption.

Information Sources

Olebermann, M. and **A.M. Gordon**. Undated. Washington Creek, case studies restoring the North American ecological landscape. www.nelson.wisc.edu/old/international/landscape/case_study_washington_creek.

Urban Forest Associates Inc. 2002. Invasive exotic species ranking for southern Ontario. Listed on Society for Ecological Restoration – Ontario Chapter website.

Literature Cited

Bent, A.C. 1968. Life histories of North American Cardinals, Grosbeaks, Buntings, Towhees, Finches, Sparrows, and Allies. Dover Publications, Inc., New York, New York.

Brawn, J.D., W. H. Elder and **K.E. Evans**. 1982. Winter foraging by cavity nesting birds in an oak-hickory forest. Wildlife Society Bulletin 10:271-275.

Brooks, W.S. 1978. Triphasic feeding behavior and the esophageal diverticulum in redpolls. Auk 95:182-183.

Chambers, F.M. and **L. Elliott**. 1989. Spread and expansion of *Alnus* Mill. in the British Isles: timing, agencies and possible vectors. Journal of Biogeography 16:541-550.

Dunn, E.H. and **D.L. Tessanglia-Hymes**. 1990. Birds at Your Feeder. W.W. Norton & Company, New York, New York.

Kirk, D.A. and **K.A. Hobson**. 2001. Bird–habitat relationships in Jack Pine boreal forests. Forest Ecology and Management 147:217-243.

Lauriault, J. 1989. Identification Guide to the Trees of Canada. National Museum of Natural Sciences. Fitzhenry & Whiteside, Ottawa., Ontario. 479pp.

Martin, A.C., H.S. Zim and **A.L. Nelson**. 1951. American Wildlife and Plants. McGraw-Hill, Toronto, Ontario. 500pp.

McVean, D.N. 1953. Biological flora of the British Isles: *Alnus glutinosa* (L) Gaertn. *(A. rotundifolia* Stokes). Journal of Ecology 41:447-466.

McVean, D.N. 1955. Ecology of *Alnus glutinosa* (L) Gaertn. Fruit formation. Journal of Ecology 43:46-60.

More, D. and **J. White.** 2002. The Illustrated Encyclopedia of Trees. Timber Press, Inc. Portland, Oregon.

Morton Arboretum. 2002. Trees and Shrubs That Attract Birds. Lisle, Illinois.

Ontario Forestry Association. Undated pamphlet. The Honour Roll of Ontario Trees. Ontario Forestry Association.

Pizelle, G. 1984. Seasonal variations of the sexual reproductive growth and nitrogenase activity W2112 in mature *Alnus glutinosa.* Plant and Soil 78:181-188.

Robinson, S.K. and **R.T. Holmes.** 1984. Effects of plant species and foliage structure on the foraging behavior of forest birds. Auk 101:672-684.

Root, T. 1988. Atlas of the Wintering North American Birds. University of Chicago Press, Chicago, Illinois. 312pp.

Soper, J.H. and **M.L. Heimburger**. 1982. Shrubs of Ontario. Royal Ontario Museum, Toronto, Ontario. 495pp.

Stanevicius, V. and **A. Balevicius**. 2005. Factors influencing nest material selection in Marsh Harrier (*Circus aeruginosus*). Acta Zoologica Lituanica 15:21-30.

Wesolowski, T. 1995. The loss of avian cavities by injury compartmentalization in a primeval European forest. Condor 97:256-257.

Wild Scotland. 2006. Alder, *Alnus glutinosa.* Wild Scotland, Inverness, Scotland.

Kenneth W. Dance, Falcon Ridge Farm, R.R. #1 Drumbo, Ontario N0J 1G0

Figure 1: Nashville Warbler probing Pin Cherry flowers, 15 May 2007, Algonquin Park Visitor Centre, Nipissing District, Ontario. *Photo: Rick Stronks.*

Nectar-Feeding by a Nashville Warbler

Justin Peter

Introduction

On 15 May 2007, at 1530h, I observed a male Nashville Warbler (*Vermivora ruficapilla*) foraging in a mature, blooming Pin Cherry (*Prunus pensylvanica*) tree located at the Algonquin Park Visitor Centre (Sproule Township, *Nipissing*, Ontario). The warbler moved deliberately from one umbel of blossoms to the next, systematically and finely probing each flower that was within reach. It would then quickly hop or fly a short distance to another umbel and repeat the routine. In so doing, the Nashville Warbler covered approximately three cubic metres of the cherry's crown volume over 20 minutes.

In watching the warbler's behaviour I began to wonder whether it might be nectar-feeding at the cherry blossoms. I alerted my colleague Rick Stronks, who began taking photographs of the bird (Figure 1). The warbler did not conduct an exaggerated gross visual inspection of each flower prior to probing it, nor did the bird appear to discriminate between flowers equally within its reach. With binoculars, I confirmed that the warbler was not moving its bill or head in such a way that would suggest the seizing and ingesting of arthropod prey, nor did it bill-swipe. I later inspected some of the umbels of this cherry tree up-close, as well as those of a nearby blooming Pin Cherry stand (20^{+} stems), and saw no evidence of arthropods either on or inside the flowers, or on the foliage. The temperature at the time of the observation was 13.3° C, with overcast skies, fog and intermittent light mist.

On 17 May 2007, a sunny and mild day, I again observed a male Nashville Warbler foraging in the same cherry tree; this time, it was vigorously gleaning

and hawking. Insect activity was well in evidence as many flying insects including hymenopterans were visible about the cherry, attracted to its blossoms. This second Nashville Warbler did not exhibit any behaviour that suggested nectar-feeding as had the warbler of 15 May 2007.

Discussion

Nectar-feeding is a well-documented behaviour among various Neotropical migrant wood-warblers on their wintering grounds in Central and South America. This includes the Tennessee Warbler (*V. peregrina*; Rimmer and McFarland 1998), the Cape May Warbler (*Dendroica tigrina*; Baltz and Latta 1998) and the Palm Warbler (*D. palmarum*; Wilson Jr. 1996). The Cerulean Warbler *(D. cerulea)* and other species have been observed nectar-feeding at the tubular blossoms of the *Erythrina* tree in shade-grown coffee plantations on the warblers' wintering grounds in Mexico (Jones *et al.* 2000). I found one published account of nectar-feeding by the Nashville Warbler in winter; it was observed at two species of *Salvia* in Mexico during early return migration in February (Del Coro Arizmendi 2001). The Nashville Warbler has also been observed flocking with other warbler species in flowering trees on its wintering grounds (Howell and Webb 1995 in Williams 1996).

The extent to which the Nashville Warbler or other wood-warblers feed on nectar later during spring migration, or on their breeding grounds, is much less well-documented. The Nashville Warbler's diet at all times is thought to consist almost entirely of insects (adults and larvae), which it captures mainly by gleaning, but also occasionally by hovering (Bent 1953, Williams 1996). Observations of nectar-feeding made in North America during spring migration, however, suggest that flower nectar may serve as a surrogate food source for some warblers during periods of low insect activity. Sealy (1989) observed Cape May Warblers nectar-feeding on Peachleaved Willow (*Salix amygdaloides*) in Manitoba during an unseasonably cool spring migration, but never during five previous springs with seasonable temperatures. Nashville Warblers, Cape May Warblers and Tennessee Warblers were observed nectar-feeding on a species of native plum (*Prunus* sp.) in Minnesota during May 1997, following several days of unseasonably cool weather in a late spring migration (Rogers 1997).

Weather conditions at Algonquin Park during the period of 10 through 15 May 2007 were highly variable. Temperatures were unseasonably mild at first and then seasonal, but this was followed by a hard frost on the night of 12-13 May (temperature several degrees below 0º C) and a lighter frost on the night of 13-14 May. Nighttime temperatures thereafter moderated through 15 May; however, daytime solar radiation decreased and relative humidity increased

to above 90%, creating what can be described as damp and unpleasant conditions on the day of the observation. Insect activity was visibly depressed. In addition to the lack of insects on the cherry trees already noted, no flying insects were observed on 15 May. In this context, it appears that the Nashville Warbler I observed was opportunistically exploiting the nectar in the Pin Cherry blossoms as an alternative food source due to the unavailability of otherwise staple arthropod prey.

This observation is further evidence of dietary plasticity by warblers during migration, and suggests that nectar-feeding during migration or on the breeding grounds may actually be more common than previously thought. Whether Neotropical migrant warblers by their nectar-feeding are significant pollinators of *Prunus* and other flowering plants along their migration routes and on their breeding territories remains undetermined.

Acknowledgements

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Literature Cited

Bent, A.C. 1953. Life Histories of North American Wood Warblers, Part 1. United States National Museum Bulletin No. 203.

Baltz, M.E. and **S.C. Latta**.1998. Cape May Warbler (*Dendroica tigrina*). *In* The Birds of North America, No. 332 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania.

Del Coro Arizmendi, M. 2001. Multiple ecological interactions: Nectar robbers and hummingbirds in a highland forest in Mexico. Canadian Journal of Zoology 29:997-1006.

Jones, J., P.R. Perazzf, E.H. Carruthers and **R.J. Robertson.** 2000. Sociality and foraging behavior of the Cerulean Warbler in Venezuelan shade-coffee plantations. Condor 102:958-962.

Rimmer, C.C. and **K.P. McFarland.** 1998. Tennessee Warbler (*Vermivora peregrina).* *In* The Birds of North America, No. 350 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania.

Rogers, L.L. 1997. Nectar-feeding by Cape May, Tennessee, and Nashville Warblers in Minnesota. The Loon 69:55-56.

Sealy, S.G. 1989. Defense of nectar resources by migrating Cape May Warblers. Journal of Field Ornithology 60:89-93.

Williams, J. 1996. Nashville Warbler (*Vermivora ruficapilla*). *In* The Birds of North America, No. 205 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania.

Wilson, Jr., W.H. 1996. Palm Warbler (*Dendroica palmarum). In* The Birds of North America, No. 238 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, Pennsylvania.

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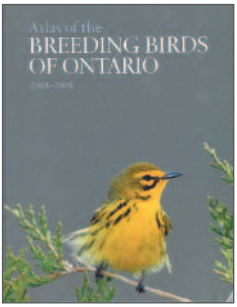
Book Reviews



Atlas of the Breeding Birds of Ontario, 2001-2005. 2007. Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.). Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp., 900+ distribution and relative abundance maps, 400+ photos of birds and habitats, and 300 graphs showing population change by life zone. ISBN 978-1-896059-15-0. Hardcover, $92.50 + GST.

In 1987, the Federation of Ontario Naturalists and the Long Point Observatory published *Atlas of the Breeding Birds of Ontario*, compiled by Michael Cadman *et al.* A total of 1,351 atlassers reported 123,879 hours of data collection, and breeding status was indicated in shades of red for 292 species and 2 hybrids in a 617-page book.

The new volume is totally different. More than 3,000 atlassers contributed in excess of 150,000 field hours and submitted 1.2 million bird records. The results for 286 species and two hybrids are presented in full color on 9x12-inch glossy pages.

The opening chapters consist of Acknowledgments, Goals, Methods, Ontario biogeography, Overview of coverage and results, Changes in bird distributions between atlases, and Interpreting species accounts. Among the 43 coloured maps are target point count coverage throughout the province, precipitation, growing season, elevation, human population, forest cover, fieldwork hours, species per 10-km square and 100-km block, species per square adjusted to 20 hours of effort, number of point counts per square and per 100-km block, human population change and change in improved pasture from 1981 to 2001, and change in total species and in forest species, grassland species, shrubland species, and aerial foragers since the 1981-1985 atlas.

The species accounts follow the customary two-page bird atlas format, with a stunning colored photo of the breeding bird and a colored map of southern Ontario showing the current breeding evidence (Possible, Probable, or Confirmed) for each 10-km square. A central black dot is added in each square where the species was found in the first atlas but not the second, and a central yellow dot designates each square where a species was found in the second atlas but not the first. A smaller map shows

map shows current presence and changes for the entire province of Ontario by 100-km blocks. The facing page, for most species, shows contour mapping in bright colors of the relative abundance (birds per 25 5-minute point counts) as well as a bar graph showing probability of observation in the first and second atlases in each of the five physiographic regions and for the entire province. One can tell at a glance whether a species in increasing or declining, and where these changes are taking place. The bird name is given in English, French, and Latin. After a brief introductory paragraph, the species text, which is all new, is grouped in three paragraphs: Distribution and population status, Breeding biology, and Abundance.

Following the species accounts are paragraphs on the status of twenty species of historical breeders. Appendices, in addition to the required Literature Cited and Index, include details of data processing and validation, collection and mapping of abundance data, species at risk, gazetteer of place names, list of plant and animal names, a glossary, bird conservation initiatives, and three fascinating tables: (1) For each species the number of squares with Possible, Probable, and Confirmed status in the first and second atlas in each of the five regions of Ontario; (2) The proportional change from the first to the second atlas for each species, grouped by habitat, arranged from species of greatest increase to greatest decline; and (3) Population size estimates by region, based on point counts in the second atlas corrected for detectability.

This book will surely serve as a model for other atlas projects worldwide, as it shows how the raw data from atlas projects can be refined in various ways to make them more useful for conservation planning. It is a classic in several respects. It represents a unique collaboration among national, provincial, and non-governmental organizations; a Herculean effort to sample the huge roadless areas of northern Ontario; use of five-minute point counts adjusted for time of day to estimate relative abundance throughout the province; and use of kriging to interpolate abundance from the 24 nearest neighbors to each target cell for abundance mapping. As a salute to the environment, the paper on which the book is printed was harvested from responsibly managed forests certified by the Forest Stewardship Council, and net profits from the book will be used for bird conservation projects in Ontario.

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Nikon Photo Quiz

Sponsored by Nikon Canada *Glenn Coady*

Photo A

Photo B

As a tribute to our recently published Ontario Breeding Bird Atlas 2001-2005, this photo quiz is a little more unconventional than usual. Perhaps it will assist those still experiencing pangs of withdrawal in this third breeding season since field work on the atlas was completed.

In these two photographs, I have presented the reader with two views of the same nest, both before and after the hatching of the first egg.

Your assignment for this photo quiz is three-fold: decide how many species have laid eggs in this nest; identify the species which laid the eggs; and identify the species of the nestling.

The first impression we see from photo A is of a twig nest with minimal lining, containing three unmarked,

bluish eggs. Considering the colour of the eggs alone, the list of potential candidates is already fairly limited.

The number of Ontario breeding species that can have unmarked bluish eggs includes Double-crested Cormorant, several heron species (Great Blue Heron, Great Egret, Snowy Egret, Black-crowned Night-Heron and Green Heron), a variety of ducks (Mallard, Northern Pintail, Common Goldeneye, etc.), cuckoos (Black-billed Cuckoo and Yellow-billed Cuckoo), Gray Catbird, thrushes (American Robin, Wood Thrush, Hermit Thrush, Veery and Eastern Bluebird) and Dickcissel.

The placement of these three eggs in a twig nest within a bush effectively rules out further consideration of any duck species. A quick look at the nestling in photo B reveals that it is lacking the long, stout bill one would expect to see with nestlings of the Double-crested Cormorant, Great Blue Heron, Great Egret, Snowy Egret, Black-crowned Night-Heron or Green Heron.

Another species easily eliminated is the Gray Catbird. It usually builds a nest that is completely lined, and its eggs are a much deeper, darker blue-green than any of the eggs in these photographs.

Likewise, most of the thrushes that lay unmarked blue eggs (American Robin, Wood Thrush, Hermit Thrush and Veery), have considerably deeper blue eggs than those seen in this nest. They also tend to have smaller eggs than those we see here, and clutch sizes that are generally larger. They also tend to build nests that are neater, more interwoven, and much more completely lined. The Dickcissel can also be ruled out using all of these same considerations.

Eastern Bluebird eggs are generally pale blue, but they are smaller than these eggs and the clutch size is usually larger. The Eastern Bluebird is almost exclusively a cavity nester, with open cup nests being

extremely rare. Recently hatched bluebird nestlings have bare dark skin and bright yellow gape lines along the bill, unlike our quiz bird.

By process of elimination, we now know that our quiz bird is therefore one of the two cuckoo species that breed in Ontario. One feature that we can see in the photographs that clearly supports that conclusion is the flimsy and loosely interwoven nest made of long twigs, and which has very minimal lining. These are typical characteristics of cuckoo nests.

The clearest indication that this is a cuckoo nest is found by observing the nestling in photo B. This bird has glossy, black skin with long, gray, almost porcupine-like or hair-like projections (neossoptiles) from the bare skin. The bird's open gape is bright red, with a complex pattern of (both small and large) creamy-white, disk-shaped markings, or papillae, on the palate and tongue. This is a distinctive pattern that readily identifies cuckoo nestlings.

The eggs of the two species of cuckoo in Ontario can be easily differentiated. The eggs of the Black-billed Cuckoo are darker, bluer, and smaller than eggs of the Yellow-billed Cuckoo, which are predominantly white with a faint blue cast. Looking at photo A, this nest has two smaller, darker blue eggs and one larger egg with a faint blue cast. It would appear that this nest has eggs of both cuckoos. These two species of cuckoo are known to parasitize each others' nests frequently. Parasitism of either species by the Brown-headed Cowbird is rare, and the much shorter incubation and nestling periods for both cuckoos makes it most unlikely for a Brown-headed Cowbird chick to fledge successfully from a cuckoo nest.

Incubation by cuckoos is nearly continuous, and it begins with the laying of the first egg. This means the first egg to hatch in a parasitized nest is very highly likely to belong to the host species. The two photographs clearly show that one of the smaller, brighter blue eggs was the one that hatched, and therefore our nestling is a **Black-billed Cuckoo.** This Black-billed Cuckoo nest has been parasitized by a Yellow-billed Cuckoo. Since intraspecific parasitism is known for both cuckoos, it is even impossible to be certain that both of the Black-billed Cuckoo eggs were laid by the same female!

This Black-billed Cuckoo nest was found north of Tilsonburg, Oxford County, by Jeff Balsdon, and photographed on 6 and 8 June 2006 by Mark Peck.

Photo: Brian Morin

ERRATUM

Great Black-backed Gulls

In our recent article on the nesting of Great Black-backed Gulls on Lake Erie (Ontario Birds 25 [3]: 124-132), we overlooked a critical nest record for this water body. Peck and James (1994, Ontario Birds 12 [1]: 11-18) reported a single Great Black-backed Gull nest on Mohawk Island (Haldimand-Norfolk County) in 1991 (p.12), making this the first nest record for this species on Lake Erie. Therefore, single nests on Mohawk Island in 1991, 1993 and 1996 would be the first, second and fourth records, respectively, for Lake Erie; single nests at the Port Colborne Breakwall in 1995, 1996 and 1999-2001 constitute the third, fifth and subsequent nest records, respectively. We are grateful to George Peck for bringing this record to our attention, and apologize for any inconvenience our omission has caused.

Sincerely,
Dave Moore, Ralph Morris
and *Chip Weseloh*

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