Changes in Ontario bird populations: 1983-2016

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Wild Turkey. *Photo: Daniel Cadieux*

Introduction

There have been many changes to Ontario bird populations since the publication of the first issue of *Ontario Birds* in 1983. Some of these, such as the dramatic increase in Wild Turkey (*Meleagris gallopavo*) across southern and central Ontario, are evident to most observers, while others, such as the near extirpation of the Henslow's Sparrow (*Ammodramus henslowii)* have slipped by largely unnoticed by any but the most involved or informed. In this article, through a series of 11 brief summaries by Ontario experts, an overview is provided of some of the major changes that have taken place to individual species and groups of birds over the past three decades. The goal is not to provide a comprehensive analysis of bird population change, but to highlight certain species and/or groups that will help provide insight into changes of interest to readers of *Ontario Birds*. To better understand the information provided here, and for a broader perspective on how Ontario's birds are faring relative to those across the country and the continent, we highly recommend two recent publications: *The State of Canada's Birds* (NABCI-Canada 2012) and *The State of North America's Birds* (NABCI 2016).

The State of Canada's Birds (NABCI-Canada 2012) found that, on average, Canadian breeding bird populations have decreased 12% since 1983, when effective monitoring began for most species. For species with sufficient data to monitor their status, 44% have decreased, 33% have increased and 23% have shown

little overall change. Some groups, such as grassland birds, aerial insectivores and shorebirds, show substantial declines. Other groups such as waterfowl, raptors and colonial waterbirds are increasing, due to careful management, changes in habitat and reductions in environmental contaminants (NABCI-Canada 2012).

The situation at the continental scale provides additional cause for concern. *The State of North America's Birds* (NABCI 2016) — an unprecedented vulnerability assessment of our continent's birds, including Canada, the United States and Mexico — concludes that 432 of North America's 1,154 native bird species (37%) require urgent conservation action. In particular, birds that depend on oceans and tropical forests are most imperiled due to severe habitat threats, restricted ranges and declining populations. Species that rely on coasts, grasslands and arid lands are faring poorly on average, while results for temperate forests, tundra, wetlands and the boreal forest are mixed.

Familiar Ontario bird species can be found among the list of winners and losers at both the national and continental scales. Interestingly, the 22% of Canada's bird species that stay primarily year-round in Canada are doing very well generally, with an overall increase of 50% since 1970. But the 15% that winter in South America have declined by 60% in Canada in the same period (NABCI-Canada 2012). The reasons for this pattern are unknown, but it suggests that significant changes are underway either in the wintering areas, along migratory routes or both, and it is evident that the fate of migratory birds is intertwined with that of resident species and habitats outside of the province. A full lifecycle approach, addressing species' needs during breeding, migration and wintering, is essential for conserving Ontario's (and Canada's) birds.

The 25 species that have increased and decreased the most in Ontario since 1983 according to the Breeding Bird Survey (BBS) are shown in Table 1. The BBS is a road-side survey, so it represents terrestrial landbirds better than wetland and colonial species, and can only provide trends for areas with roads. As a result, some significant changes in numbers, such as those of the Trumpeter Swan (*Cygnus buccinator*) are not shown in this table, and there is no coverage for vast areas of northern Ontario's boreal forest and Hudson Bay Lowlands. Note also that some terrestrial species, such as the Northern Bobwhite (*Colinus virginianus*) and Yellow-breasted Chat (*Icteria virens*) do not appear on the table, despite their near extirpation from the province over the past 30 years, because they are encountered so infrequently that BBS does not track them reliably. Some of the patterns revealed in the table, such as the large increases in many "big" birds, the expansion of species edging northward into and within the province, and the decline of the grassland and aerial insectivore species are expanded on in the accounts that follow.

Table 1. The 25 species showing (a) the largest increases and (b) the largest decreases in Ontario in the period 1983-2013 according to the Breeding Bird Survey (Sauer *et al.* 2014). Nomenclature follows American Ornithologists' Union (2015). Trend shown is annual % change.

a) Largest Increases 1983-2013

Rank	Species	Trend
1	Wild Turkey	31.4
2	Canada Goose	18.1
3	Double-crested Cormorant	18.0
4	Sandhill Crane	16.5
5	Bald Eagle	14.5
6	House Finch	13.8
7	Red-bellied Woodpecker	11.6
8	Turkey Vulture	8.9
9	Palm Warbler	7.7
10	Northern Parula	7.3
11	Blue-winged Warbler	7.2
12	Orchard Oriole	5.1
13	Osprey	4.8
14	Philadelphia Vireo	4.7
15	Wood Duck	4.6
16	Blue-headed Vireo	4.4
17	Hooded Merganser	4.2
18	Pine Warbler	3.8
19	Cooper's Hawk	3.7
20	Brown Creeper	3.6
21	Yellow-bellied Flycatcher	3.5
22	Ring-billed Gull	3.5
23	Merlin	3.5
24	Northern Cardinal	3.2
25	Mallard	2.8

b) Largest Decreases 1983-2013

Rank	Species	Trend
1	Loggerhead Shrike	-11.0
2	Chimney Swift	-7.8
3	Cliff Swallow	-7.4
4	Common Gallinule	-6.7
5	Bank Swallow	-6.3
6	Evening Grosbeak	-6.1
7	Rusty Blackbird	-5.9
8	Black Tern	-5.7
9	Blue-winged Teal	-4.9
10	Purple Martin	-4.7
11	Western Meadowlark	-4.5
12	House Sparrow	-4.3
13	Ring-necked Pheasant	-4.2
14	Herring Gull	-3.8
15	Tennessee Warbler	-3.7
16	Tree Swallow	-3.7
17	Red-headed Woodpecker	-3.7
18	Brown-headed Cowbird	-3.7
19	Killdeer	-3.6
20	Bobolink	-3.5
21	Spotted Sandpiper	-3.5
22	Vesper Sparrow	-3.5
23	American Black Duck	-3.3
24	Upland Sandpiper	-3.2
25	Eastern Whip-poor-will	-3.0

Greater Snow Geese. *Photo: Brian Morin*

Species Accounts

Ontario's Goose Populations

The story of geese in Ontario since the first issue of *Ontario Birds* is one of an overall dramatic and positive response to human-caused landscape changes. Changes both within and beyond Ontario have resulted in more geese almost everywhere. The main cause is that the geese adopted new diets in the mid to late 20th century by foraging in agriculturally dominated habitats. With a single exception among regularly occurring species, diets of geese during migration and winter now consist primarily of cereal grains left after harvesting, and green forage plants in managed rural and urban grasslands. For temperate breeding Canada Geese (*Branta canadensis maxima*), this adaptation extends to all seasons as they also nest and rear young in agricultural and urban areas. Secondary causes of population increases include lower harvest rates/higher survival rates for Canada, Cackling (*B. hutchinsii*), Lesser Snow (*Chen caerulescens caerulescens*) and Greater Snow Geese (*C. c. atlantica*), a reflection of changing demographics among hunter populations.

Canada Geese in Ontario include temperate breeders of the south and near north, and subarctic breeders of the Hudson Bay Lowlands (HBL). Temperate breeders increased from about 10,000 to 180,000 breeding adults from 1980 to 2006, but have since declined somewhat (CWSWC 2015). Subarctic breeders increased throughout the mid 20th century to the late 1980s, to over 900,000 birds, but have declined gradually since then and have been relatively stable for the past decade at about 400,000 breeding adults (CWSWC 2015).

The Cackling Goose became recognized as a separate species from Canada Goose in 2004 (Banks *et al.* 2004). Ontario-observed Cackling Geese come from the Baffin Island breeding segment of the Mid-Continent Population (Abraham 2005), which grew from about 1 million in 1987 to almost 4 million in 2013 (CWSWC 2015).

Lesser Snow Geese breeding in Ontario's portion of the HBL increased from 120,000 in 1979 to over 400,000 breeding adults in the mid 1990s (Abraham *et al.* 1998), part of a continental population explosion. The number has since declined (Abraham 2007a) to about 300,000 birds.

One of the most dramatic goose status changes we have witnessed is the range expansion of Greater Snow Goose in extreme southeastern Ontario, an area which now hosts 70,000-100,000 birds for short periods during spring and fall migration to and from their breeding grounds in the eastern high arctic (Morin and Hughes 2010). This, too, is part of a continental growth spurt from 300,000 birds in the mid 1980s to 1.4 million in 2009.

In similar fashion, the Ross's Goose (*C. rossii*) has increased as both a migrant and a breeder in Ontario. A noteworthy rarity in 1982, it was removed from the review list of the Ontario Bird Records Committee (OBRC) for southern Ontario in 2006 (Crins 2007). The number of breeders in the Ontario HBL was estimated to be a few hundred pairs as of 2005 (Abraham 2007b), but has likely increased since then. Its Ontario status reflects an increase from about only 6,000 birds continentally in the 1940s to over 2.7 million in 2014 and a large-scale eastward range expansion (CWSWC 2015).

In Ontario, the pattern of increased observations of migrating White-fronted Geese (*Anser albifrons*) mimics the Ross's Goose story. The Mid-Continent Population, from which Ontario whitefronts are derived, increased from about 1 million to nearly 2.5 million between 1986 and 2013 (CWSWC 2015); it is being observed in Ontario in increasing numbers annually each spring.

The lone exception to this story of agriculturally-subsidized population growth is the Brant (*Branta bernicla*), which continues to rely on native habitats in all seasons for its diet and nutritional needs. It regularly migrates to and from its low arctic breeding grounds through eastern Ontario and James Bay in spring and fall, but does not nest in Ontario (but see Lumsden 1987a). The continental population has been stable with a long-term winter index average of 136,000 birds (CWSWC 2015).

Wood Duck. *Photo: Saul Bocian*

Ontario's Duck Populations

Ontario's duck picture over the last 33 years is mostly good news, with only one exception. Populations of almost all of Ontario's breeding species are either stable or increasing in numbers. Among the dabblers, the Mallard (*Anas platyrhynchos*) has increased the most since the early 1980s, especially in the north. Data from the Southern Ontario Waterfowl Plot Survey, ongoing through the early 1980s, shows a slight increase in the number of breeding pairs per year in the south (i.e., 0.5%), but both the Waterfowl Breeding Population and Habitat Survey (from the early 1980s in northwestern Ontario) and the Eastern Waterfowl Survey (ongoing since 1990 in northeastern Ontario) show an approximate two-fold and 1.2-fold increase in the breeding population of Mallards in the north (CWSWC 2015; USFWS 2016). At the same time, American Black Ducks (*Anas rubripes*) declined dramatically by close to 30% in the south from the early 1980s and approximately by 20% in the north since 1990. Recently, however, the breeding population appears to have stabilized (CWSWC 2015). Whether the increase in Mallards has caused the decline in black ducks is still unclear as landscape change and disturbance from cottage encroachment have also occurred concurrently.

For the divers, Ring-necked Duck (*Aythya collaris*) increased by almost 20% in the northeast and over 200% in the northwest, with an overall increase in all regions between breeding bird atlas periods (Leckie 2007). Similarly, the probability of observation for cavity-nesting species, such as Wood Duck *(Aix sponsa*), Hooded Merganser (*Lophodytes cucullatus*) and Bufflehead (*Bucephala albeola*), also increased in all regions between the two atlases (Bouvier 2007, Mallory 2007, Zimmerling 2007). For example, the Wood Duck has increased by close to 10% and 40% in the northern and southern parts of its range in Ontario while the Hooded Merganser has increased by 12% and 20% in these respective areas (CWSWC 2015).

Undoubtedly, some of the above changes stem from the creation of the North American Waterfowl Management Plan in 1986, which laid the foundation for species and habitat Joint Ventures, such as the Ontario Eastern Habitat Joint Venture. This partnership supports "on the ground" habitat work, landowner stewardship and public education and outreach, which have all greatly benefited Ontario's ducks.

The Blue-winged Teal (*Anas discors*) is the exception to the positive outlook for Ontario's ducks. In southern Ontario, it declined by close to 8% per year since 1981, with large losses occurring in the last 10 years (~14.8% per year) (CWSWC 2015). Similarly, a large decline in the probability of observation occurred in all regions between the two atlas periods (Ross 2007). Breeding numbers in northwestern Ontario, however, show an opposite trend, with an approximate two-fold increase in the population between the early 1980s and recent time periods (USFWS 2016). This result highlights the need to better understand factors driving Blue-winged Teal numbers in southern versus northern Ontario.

With respect to staging birds, major changes have occurred in the distribution and abundance of ducks on the lower Great Lakes since the early 1980s. For bay ducks (e.g., scaup [*Aythya* spp.], Redhead [*Aythya americana*] and Canvasback [*Aythya valisineria*]), numbers increased from the 1980s, then peaked in the mid to late 1990s, and since then have declined back to 1980 levels. Some of this change is related to steep declines in the continental scaup population since the 1980s, as many of these birds stage in Ontario (CWSWC 2015). Some areas (e.g., Rondeau Bay and Lake St. Clair), however, continue to have large numbers of bay ducks which may explain losses in other areas (e.g., Long Point) (Smith *et al.* 2013). Similarly, numbers of sea ducks (e.g., Black Scoter [*Melanitta americana*], White-winged Scoter [*Melanitta fusca*] and Long-tailed Ducks [*Clangula hyemalis*]) staging on the lower Great Lakes increased from the 1980s to the 1990s, but unlike bay ducks, continue to be found in high numbers, especially in the western and eastern basin of Lake Ontario. Presumably, the introduction of exotic Zebra (*Dreissena polymorpha*) and Quagga mussels (*Dreissena bugensis*) into the lower Great Lakes in the early 1990s explains some of these changes. These introductions and their subsequent colonization greatly changed the lower Great Lakes ecosystem by

Great Egret.
Photo: Brandon Holden

increasing water clarity and changing biotic communities (Skubinna *et al.* 1995). This, in addition to a new mussel food source and changes in winter ice cover, has opened up new opportunities for ducks to "short stop" during their migration. For example, during warm winters more than 100,000 Canvasbacks overwinter on the lower Great Lakes (Canadian Wildlife Service 2016).

Overall, Ontario's duck populations have improved since the 1980s and their future continues to look bright.

Great Lakes Colonial Waterbirds

The Great Lakes are home to more than two million colonially-nesting waterbirds: 13 species of gulls, terns, cormorants, pelicans and herons (Weseloh *et al.* 2003, unpubl. data). Since the mid-1970s, the nests of these species have been counted, Great Lakes-wide, by the U.S. Fish and Wildlife Service and the Canadian Wildlife Service approximately every decade. It is a huge undertaking that takes two to three years to complete. The methods and results of the counts for the first three decades, the 1970s, 1980s and 1990s, have been published widely (Weseloh *et al.* 1986; Blokpoel and Tessier 1997, 1998; Morris *et al.* 2011, Rush *et al.* 2015 and references therein). The goal of this paper is to present the general results of the fourth decadal survey (2007-08) in the Canadian Great Lakes for three representative species: the Double-crested Cormorant (*Phalacrocorax auritus,* henceforth cormorant), the Great Egret (*Ardea alba,* henceforth egret) and the Herring Gull (*Larus argentatus*), and to discuss the change in nest numbers of those species particularly during the years of *Ontario Birds*, 1983 – 2016.

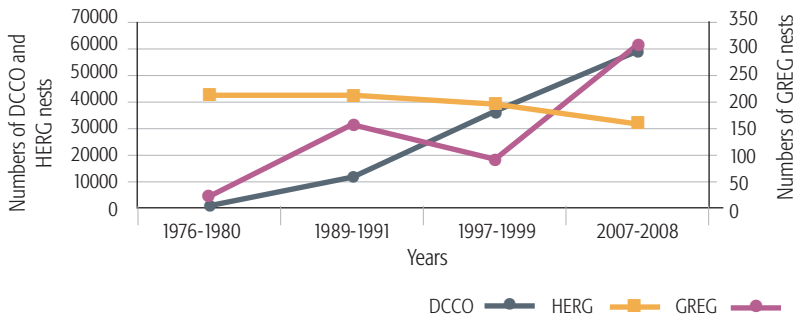
The study area included the shoreline and islands of the Canadian portions of Lakes Superior, Huron, St. Clair, Erie and Ontario as well as the St. Marys, Detroit, Niagara and St. Lawrence rivers, from the Minnesota-Ontario border to the Ontario-Quebec border. Virtually all nest sites were accessed by boat (or truck) and ground counts of individual nests were recorded; a very few sites had to be estimated from boats due to rough mooring or landing conditions.

The results and years of the four decadal surveys for the three species are shown in Figure 1. Within the *Ontario Birds* years, nest numbers of cormorants increased four-fold (405%) from 1989-2008. Nest numbers of egrets increased 99.4% (i.e., they nearly doubled) and nest numbers of Herring Gulls declined by nearly one quarter (23.7%).

The dramatic increase in cormorant nest numbers on the Great Lakes has been ongoing since the mid-1970s and has been well documented in both the US and Canada (Weseloh *et al.* 1995); from 1989 to 2008, nest numbers increased from 11,614 to 58,613. The main reasons cited for this species' increase are reduced contaminant levels in Great Lakes fish (the cormorants' main food), the abundant food supply in the Great Lakes due to the reduction of piscivorous predators during the 1950s to early 1970s and the increased protection for the species as a result of the *Migratory Bird Treaty Act* between the USA and Mexico in 1972 and Ontario provincial legislation (Price and Weseloh 1986, Keith 1995, Weseloh *et al.* 2002). Lake Huron and Lake Ontario had the largest number of cormorant nests in 2007-08 with just under 21,000 and 20,000 nests, respectively.

With the exception of 1997-99, nest numbers of egrets showed a steady increase (from 156 to 311 nests) but much slower than seen in cormorants. In 1997-99, the number of egret nests had declined by 39.7% since the previous survey with all of the decrease occurring on Lake Erie where the number of nests (at its two Canadian colonies) declined from 143 to 32. During that same period, the number of cormorant nests in Lake Erie increased by 280%, including at the two

Figure 1. Trends in nest numbers of Double-crested Cormorants (DCCO), Herring Gulls (HERG) and Great Egrets (GREG) on the Canadian Great Lakes, 1970s – 2000s.



egret colonies; presumably egret nests were usurped by cormorants as has been witnessed elsewhere (Gull Island, Presqu'ile Provincial Park, Brighton, Ontario, D. Moore, pers. obs.). In contrast, nest numbers have increased steadily on Lake Huron (217 nests in 2007-09; 70% of the Canadian Great Lakes total), due mainly to growth of a colony on Nottawasaga Island, near Collingwood, ON. The precise reason for the increase in egret nests is not known but the four egret colonies on the U.S. side of western Lake Erie supported over 1,400 nests in 1991 (Rush *et al.* 2015) and this was probably the nucleus from which egrets spread into Ontario.

In contrast to cormorants and egrets, Herring Gull nest numbers declined dramatically (from over 42,000 nests to under 32,000) on all waterbodies except Lake Ontario and the St. Lawrence River. The largest declines occurred in Georgian Bay (Lake Huron, a decline of over 4,200 nests) and in Lake Superior (over 2,900 nests). Lake Ontario and the St. Lawrence River, together, gained 120 nests. The decline in Herring Gulls has been attributed to several contributing factors: regime shifts within fish populations in Lake Huron (Ridgway and Middel 2015) and resulting shifts in Herring Gull diet and reproduction (Hebert *et al.* 2008, 2009), intentional release of raccoons and foxes on breeding colonies by fishermen to 'control' Double-crested Cormorants (Pekarik *et al.* 2016, C. Weseloh unpubl.) and destruction of gull nests and displacement by cormorants (e.g., Somers *et al.* 2011).

Colonially-nesting waterbirds are top-level predators in Ontario's aquatic environments, and as such are sentinels of ecosystem-wide changes in these habitats, especially on the Great Lakes. Dramatic increases, as seen in cormorants and egrets, or declines in iconic species like the Herring Gull, signal these ecosystem-level shifts. Continued long-term monitoring of these species is crucial for understanding the processes that are driving change, predicting population trajectories and conservation planning. The next wide-scale colonial waterbird census on the Great Lakes is planned to coincide with data collection for the third Ontario Breeding Bird Atlas (2021-2025).

Big Birds

One of the most evident changes in Ontario bird numbers since 1983, for birders and non-birders alike, is the increase in the "big" birds in Ontario. The 12 largest birds in the province by weight are shown in Table 2. All of these species, except the Great Blue Heron (*Ardea herodias*), increased substantially between the breeding bird atlas periods (1981-1985 and 2001-2005). Of the increasing species, all but the Tundra Swan (*Cygnus columbianus*) more than doubled the number of squares in which they were recorded between atlases, and the Tundra Swan increased by 67% (Abraham 2007c).

Important conservation activities of the past century have contributed significantly to these increases. Prior to the *Migratory Bird Convention Act* of 1916, large-scale market hunting of birds, particularly the larger species, was driving many birds towards extinction, and resulted in the extirpation of Ontario's

Sandhill Crane, Double-crested Cormorant.
Photos: Ken Newcombe

breeding populations of Wild Turkey and Trumpeter Swan. One hundred years later, the MBCA is still important. Species such as the Tundra Swan and Sandhill Crane (*Grus canadensis*) which, though still hunted in other parts of their range, are protected by the Act and its associated hunting regulations to ensure that populations continue to remain healthy. The crane, in particular, has become a familiar sight across much of southern Ontario, whereas during the early 1980s, its breeding range was just beginning to expand southwards onto Manitoulin Island and the northern tip of the Bruce Peninsula. The first breeding evidence for the Rondeau area, far outside its recently held range, was established during the year, 1983, that the first issue of *Ontario Birds* appeared (Lumsden 1987b).

Some of these large species, such as the Canada Goose, Trumpeter Swan and Wild Turkey, have benefited from reintroduction efforts designed to establish self-sustaining breeding populations in the province. In a highly human-modified environment, these birds have become widely re-established across and, in the case of the Wild Turkey, well beyond, much of their former southern and central Ontario range (Bowman 2007). The Wild Turkey reintroduction began in 1984 (Bowman 2007), and the species shows the largest increase in Ontario of any bird tracked by the Breeding Bird Survey since that time (Environment and Climate Change Canada, unpublished data).

The Bald Eagle (*Haliaeetus leucocephalus*) also benefitted from reintroduction programs, though the main reason for its increase in recent decades is another conservation milestone, the banning of the pesticide DDT (*dichloro diphenyl trichloroethane*) in the early 1970s in Canada and the US (Grier 1982). This ban also helped in the increase of the fish-eating Double-crested Cormorant

Table 2. The 12 largest birds in Ontario by weight (Cadman *et al.* 2007).

Species	Weight (g)
Trumpeter Swan	10,500
Mute Swan	10,000
American White Pelican	7,700
Tundra Swan	7,000
Wild Turkey	5,800
Golden Eagle	4,400
Bald Eagle	4,325
Sandhill Crane	4,100
Canada Goose	3,050
Great Blue Heron	2,400
Turkey Vulture	1,830
Double-crested Cormorant	1,700

(Weseloh *et al.* 1995), as well as the Golden Eagle (*Aquila chrysaetos*) and other smaller raptors such as the Peregrine Falcon (*Falco peregrinus*) and Merlin (*Falco columbarius*), both of which are also much more common in Ontario now than in 1983.

The Turkey Vulture (*Cathartes aura*) has been increasing in Ontario and across North America since the 1920s, perhaps due to the increase and northern expansion of the White-tailed Deer *(Odocoileus virginianus)*, at least in the east (Kirk and Mossman 1998). When *Ontario Birds* began in 1983, the Turkey Vulture was patchily distributed across southern Ontario, with extensive areas, such as much of eastern Ontario, with very few atlas records (Peck 2007). The species is now widespread across southern Ontario where the Turkey Vulture is now one of the most prominent birds in the sky and the expansion has continued into northwestern Ontario, though the numbers are far smaller than in the south.

The success of conservation measures in relation to these big birds should provide inspiration as we face increasing conservation challenges in the decades ahead.

Red Knot

The Red Knot (*Calidris canutus*) is a holarctic breeding shorebird with three recognized subspecies in North America, two of which nest in Canada. *C. c. roselaari* breeds in western Alaska, wintering on the west coast of the southern U.S., and Mexico, with smaller numbers in western Central America and northern South America. *C. c. islandica* breeds in Greenland and the higher latitudes of the Canadian Arctic, north of the Parry Channel, wintering in Western Europe. *C. c. rufa* nests in the central Canadian Arctic and winters predominantly in Tierra del Fuego, Argentina and Chile with smaller wintering populations in southeastern United States and northern Brazil (Clements *et al.* 2015). Banding results indicate *C. c. rufa* make up the vast majority of birds migrating and staging in Ontario (SBRDM 2015).

Since the 1970s, shorebird population numbers in Canada have been showing major declines (NABCI-Canada 2012). In the mid-1980s, *C. c. rufa* numbers were estimated to be between 100,000 – 150,000 birds, but have declined precipitously since then. The most recent *rufa* population estimate is 42,000 birds (Andres *et al.* 2012) and from 1994 to

2002, demographic studies showed that annual adult survival rates had declined from 85% to 56% (Niles *et al.* 2008). The reasons for the survival and population declines remain imperfectly known. Several factors have been implicated in the population decline, including reduced availability of food resources, deterioration of habitat along migration routes and climate change. For example, the overharvest of horseshoe crab eggs in Delaware Bay reduced the amount of available food to northbound migrants during their staging period. Without adequate food resources, individuals leave Delaware Bay for the breeding grounds less prepared for their journey (i.e., with insufficient fat reserves), resulting in a reduced survival rate (Baker *et al.* 2004). *Calidris canuta rufa* has been designated endangered in Canada under the *Species at Risk Act* (SARA) and in Ontario under the *Endangered Species Act, 2007* (ESA).

In southern Ontario, *C. c. rufa* is considered a rare spring and fall transient (Curry 2006, Black and Roy 2010), arriving individually or in small numbers with only occasional larger flocks forced down by poor weather onto the eastern shores of Lake Ontario and the St Lawrence River. However, farther to the north, the southwest James Bay coast is known to be a critical staging area for several shorebird species, including the Red Knot (Morrison *et al.* 2001, Ross *et al.* 2003). From mid-July to mid-August about 15% of the estimated population of *C. c. rufa* stages along James Bay during their southbound migration, gaining the necessary reserves to complete their migration to wintering areas.

Figure 2. Individually colour-marked Red Knot banded in Argentina. Flagged birds allow researchers to track individual knots throughout the flyway providing valuable data on sex, survival and staging times.
Photo: Mark Peck.

Figure 3. Red Knots, White-rumped Sandpiper (*Calidris fuscicollis*), Semipalmated Sandpiper (*C. pusilla*) and Dunlin (*C. alpina*) all stage in large numbers in southwest James Bay, Ontario, during southbound migration. *Photo: Mark Peck.*

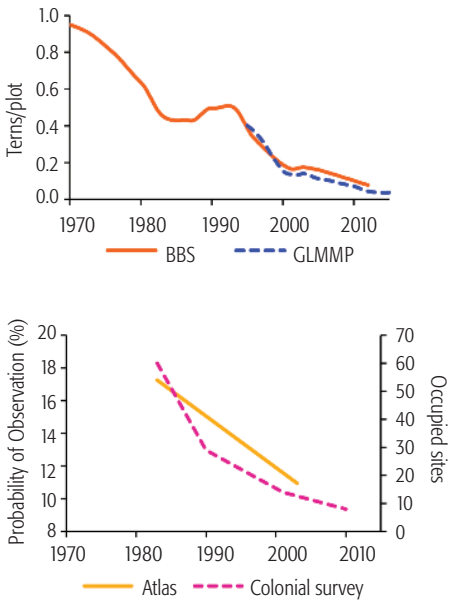
International teams, partnering throughout the Americas, have been working to determine reasons for declines observed in shorebird populations in the Western Hemisphere. With continued monitoring and the use of new technology (e.g., geolocators, molecular sexing and radio transmitter tags — see pages 134 and 124 in this issue), we now have a much better understanding of Red Knot ecology throughout the flyway. Due to this research and coordinated conservation efforts, the Red Knot population decline has leveled off and, we hope, will improve in the future.

Black Tern

This "restless waif of the air, flitting about hither and thither," as described by Bent (1921) was a common breeder in wetlands throughout southern Ontario until the early 1900s (McIlwraith 1894, Baillie and Harrington 1936). The Black Tern (*Chlidonias niger*) was still fairly common when standardized bird monitoring began in Ontario with the BBS in 1970, but by 1983, when *Ontario Birds* began, it had declined considerably (Figure 4). Today the species is even less common, as illustrated by various monitoring programs including the BBS (Environment Canada

2014a), Bird Studies Canada's Great Lakes Marsh Monitoring Program (Tozer 2013, 2016), the Ontario Breeding Bird Atlas projects (Weseloh 2007) and surveys focused on colonial marsh birds (Canadian Wildlife Service – Ontario Region, unpublished data) (Figure 4). While the species is listed as not at risk by the national body, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), it has been classified as special concern under Ontario's ESA.

Figure. 4. Top panel: Mean number of Black Terns detected by the Breeding Bird Survey (BBS) and Great Lakes Marsh Monitoring Program (GLMMP) in southern Ontario.
Bottom panel: Mean probability of observation of Black Terns within Ontario Breeding Bird Atlas squares in the Carolinian and Lake Simcoe-Rideau atlas regions and number of occupied sites detected during Great Lakes colonial marsh bird surveys. See text for sources.



The population information for Ontario is grim, with declines of 90% over the past few decades in some areas (Austen *et al.* 1994). Most Ontario birders will personally attest to the disappearance of this attractive and sought-after species from their own "hither and thither" wanderings. Sadly, the grim story is not unique to the Black Tern. It is representative of declines in populations of several other marsh birds in southern Ontario including: American Bittern (*Botaurus lentiginosus*), American Coot (*Fulica americana*), Common Gallinule (*Gallinula galeata*), Least Bittern (*Ixobrychus exilis*), Pied-billed Grebe (*Podilymbus podiceps*), Sora (*Porzana carolina*) and Virginia Rail (*Rallus limicola*) (Tozer 2013, 2016). The Black Tern, however, is decreasing faster than any other marsh bird.

What has caused Black Terns and other marsh birds to decline? The answer is not straightforward. Like other groups of declining species, we can point to a long list of factors that are probably responsible, but there is no "smoking gun" explanation. This uncertainty has more to do with the complicated ways that ecological processes influence population declines than with any shortcomings in our efforts to understand the decreases.

Population declines in Black Terns and other marsh birds in southern Ontario have likely occurred due to loss and fragmentation of marshes, changes in water levels, encroachment by urban sprawl, pollution and the spread of invasive species (Chin *et al.* 2014; Tozer 2013, 2016). Loss and fragmentation of wetlands is particularly troublesome for Black Terns because they favour large wetlands

Black Tern *Photo: Daniel Cadieux*

surrounded by other wetlands (Naugle *et al.* 1999, 2000). Water level changes and associated spread of dense emergent vegetation, such as the invasive *Phragmites australis*, can negatively influence the Black Tern's specialized floating nest sites and surrounding open-water pools (Graham *et al.* 2002, Zimmerman *et al.* 2002). Urban sprawl and pollution may take a heavier toll on Black Terns because of the effects of surface runoff of excess nutrients and chemicals on large aquatic insects and small fish, which are more important for successful chick rearing by Black Terns than for many other species (Beintema 1997). Great Horned Owls (*Bubo virginianus*) have recently been identified as a significant egg predator of Black Terns in the Kawartha Lakes region (von Zuben and Nocera 2015), although this owl has declined in numbers in southern Ontario over the past couple of decades, which may suggest that it is not a major factor contributing to Black Tern declines (Bird Studies Canada's Ontario Nocturnal Owl Survey, unpublished data; Sleep 2007). Black Tern declines are also likely influenced by factors that occur during migration and on the wintering grounds (Heath *et al.* 2009).

Strategies have been prepared which outline activities needed to recover populations of species like Black Terns and Least Bitterns (Burke 2012, Environment Canada 2014b). Many of the recovery activities for these species will benefit the other declining species. We have proven with waterfowl and raptors that we are capable of bringing back bird populations when they are in trouble. The same will hopefully be true in the future for marsh birds in Ontario.

Chimney Swift

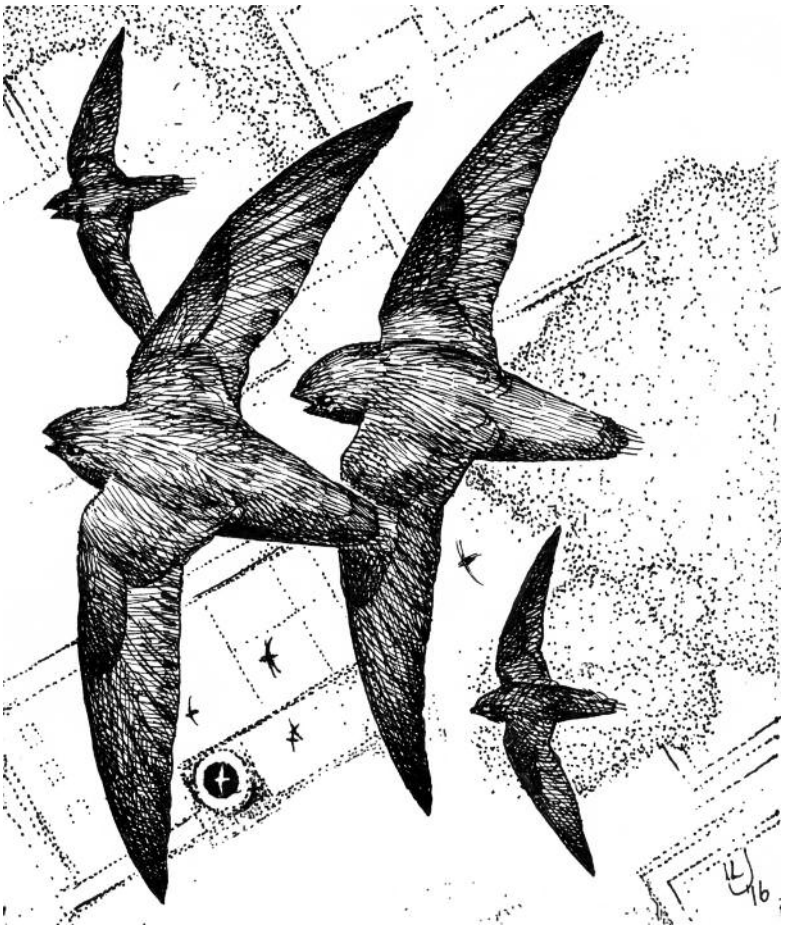
In 1983, when the first issue of *Ontario Birds* appeared, the Chimney Swift (*Chaetura pelagica*) was widespread across the southern half of the province, and was reported in 70% of the 10-km squares in southern Ontario during the first atlas (1981-1985) (Helleiner 1987). By the end of the second atlas (2001-2005), it was reported in only 44% of those same squares (Cadman 2007). From 2004, around the end of the second atlas, to 2014, the BBS has shown a further decline of 52% in the swift population, the 6th largest decline of any species in that period, and the largest of any aerial insectivore (Environment and Climate Change Canada, unpublished data).

The reasons for the decline are uncertain. The number of suitable chimneys is in decline, with old chimneys being destroyed or capped, and new chimneys having metal liners unsuitable for nesting or roosting birds. However, a study has shown that there are still a lot of suitable chimneys going unused, so that chimneys may not be the limiting factor (Fitzgerald *et al.* 2014). A study of Chimney Swift guano (Nocera *et al.* 2012) showed a shift in diet from primarily Beetles (Coleoptera) to less nutritious True Bugs (Hemiptera) that coincided with the advent of DDT use, and suggests that changing insect populations might be an important factor in aerial insectivore decline more generally.

Although swifts (and nighthawks) are now far less numerous in the skies over the cities than in 1982, large numbers of Chimney Swifts still roost communally in some places, with the largest Ontario roost occurring near the northern edge of its Ontario range in a 46 m tall chimney at the shutdown Nuclear Power Demonstration plant, near Chalk River. That roost was used by 2,563 birds on 1 June 2014 and 1,456 on 19 May 2015 (Canadian Nuclear Laboratories, unpublished data). Other cities such as Ottawa, Sault Ste. Marie and Toronto each had more than 1,000 swifts in large roosts on 20 May 2015 (BSC 2015), but those numbers pale next to some historical concentrations, such as 10,000 birds reported over Kingston on 14 May 1945 (Bowman 1952).

Other aerial insectivores such as the Bank Swallow (*Riparia riparia*) and Barn Swallow (*Hirundo rustica*) and the Common Nighthawk (*Chordeiles minor*), have shown similar trends to the swift. All have a diet of flying insects, and they all also winter in South America. This suggests either that changes in South American wintering areas might be important factors in aerial insectivore decline, or that long-distance migration

From 2004, around the end of the second atlas, to 2014, the BBS has shown a further decline of 52% in the swift population, the 6th largest decline of any species in that period, and the largest of any aerial insectivore ...



Chimney Swifts. *Illustration: Ian Jones*

is more hazardous than previously thought due to the increasing human footprint on the landscape and perhaps the rigours of climate change affecting the birds at all stages of their annual cycle. Other factors that may play a part include the availability of natural nesting cavities such as the large (<50 cm DBH) trees with "chimney" cavities in which pairs of swifts nest. Logged hardwood forests may have fewer of these rare trees (Zanchetta *et al.* 2014).

A recovery strategy is being written for the Chimney Swift, in hope that the decline can be halted in time for the 200th issue of *Ontario Birds.*

Wood Thrush. *Photo: Claude King*

Wood Thrush

The Wood Thrush (*Hylocichla mustelina*) breeds in deciduous and mixed forests throughout its North American breeding range. It was considered an uncommon breeding bird in southern Ontario in the 1930s (Baillie and Harrington 1937). However, the species underwent a significant northward range expansion from its population stronghold in the eastern United States during the first half of the 20th century and subsequently became well entrenched in Ontario. By the mid-1980s, the first *Atlas of the Breeding Birds of Ontario* reported that Wood Thrushes occurred in almost every square south of the Canadian Shield and that range expansion was still trending northwards (Sadler 1987). BBS data from that time also pointed to a significant population increase for the species in southern Ontario.

The second Atlas reported that the species' distribution had not changed significantly since the first Atlas (Friesen 2007). It also noted that although severe population declines had recently been reported in many parts of the species' North American breeding range, Ontario BBS data from 1981 to 2005 showed just the opposite — a significant increase! Several possible explanations were given for the population spike: a three-fold increase in forest cover south of the Canadian Shield in Ontario since the 1920s (Larson *et al.* 1999), and a widespread ice-storm in eastern Ontario in the late 1990s that, by opening the forest canopy, produced a flush of optimum Wood Thrush breeding habitat.

By 2012, however, BBS data from Ontario — where almost 80% of Canada's Wood Thrushes occurred — were painting a dramatically different picture

of the species' population status. In Canada, the species had declined by 83% over the preceding 41 years, and by 38% in the 10 years from 2001 to 2011 alone (COSEWIC 2012a). Trends were similarly negative for the U.S., where BBS data showed declines of more than 60% from 1966 to 2011 (Sauer *et al.* 2014).

The plight of the Wood Thrush is puzzling for a number of reasons. It is one of the more fragmentation-tolerant forest birds, often found in areas having only small, isolated woodlots (Sadler 1987, Friesen *et al.* 1999). The Wood Thrush is not regarded as being a particular habitat specialist, as are other forest songbirds such as the Cerulean Warbler (*Setophaga cerulea*) and Acadian Flycatcher (*Empidonax virescens*). Moreover, the Wood Thrush produces two, and occasionally three, broods in a single breeding season (Friesen *et al.* 2000, 2001). This buffers it from some of the worst impacts of predation and nest parasitism, such that nesting success and productivity can be high, even in highly fragmented landscapes (Friesen *et al.* 1999).

In summary, the Wood Thrush is not a species one would have expected to be 'at risk' a few decades ago when *Ontario Birds* began. Nevertheless, it was designated as threatened by COSEWIC in 2012 and special concern by Ontario's Committee on the Status of Species at Risk in Ontario in 2014, because of the recent declines.

Identifying the reasons for the Wood Thrush's plight is full of complexities, not the least of which is that the species moves thousands of kilometers between its breeding and wintering ranges. Serious problems could lie at either end of the annual migratory cycle, or even in between, and the scientific pendulum has swung back and forth attempting to diagnose where the stresses are most severe. One view is that habitat loss and degradation on the breeding grounds may be the most important factors behind the decline of long-distance migrants, including Wood Thrushes (Sherry and Holmes 1992, Rushing *et al.* 2016). An alternative view is that Wood Thrushes and other songbirds are limited primarily by events on the wintering grounds (Terborgh 1989). Most of Ontario's Wood Thrushes overwinter in Nicaragua, Honduras and Costa Rica, where deforestation rates are relentless and accelerating (Stanley *et al.* 2014).

Unfortunately, the Wood Thrush is not the only temperate forest bird that has flown into trouble. Of the 144 species that breed in temperate forests across North America, 30 are on the 'Watch List' (NABCI 2016). The declines are most acute for long-distance migrants, with species that migrate the farthest distances tending to show the largest declines (NABCI-Canada 2012). The development of sound management plans to stem the declines will require continued monitoring and research of Wood Thrushes and other long-distance migrants throughout their annual life cycle to understand the relative importance of breeding/wintering ground effects.

Evening Grosbeak. *Photo: Ann Brokelman*

Evening Grosbeak

The Evening Grosbeak (*Coccothraustes vespertinus*) is perhaps one of North America's most itinerant year-round species, breeding across a vast expanse of the southern boreal and western coniferous forests in summer, and making occasional forays into the southern United States during winter. Considered to be an irruptive migrant, it is constantly on the move, tracking and capitalizing on highly ephemeral food resources. It is this penchant for movement that likely resulted in the significant expansion of its historical range from west of the Rocky Mountains to much of central and eastern Canada over a century ago (Brunton 1994). The human settlement of much of the prairies during this time may have facilitated this expansion due to the planting of shelterbelt trees, such as Manitoba maple (*Acer negundo*), which provided an abundant and reliable food source that enabled them to survive harsh winters (Forbush 1929). Even today, the species remains highly nomadic and its occurrence, while exciting, is often unpredictable and enigmatic.

While understanding this transient nature was the focus of widespread bird banding efforts in the last century, this aspect of the species' ecology also makes it difficult to track and systematically monitor. As a result, it has taken many decades of data from several monitoring programs to obtain credible status and trend data for Evening Grosbeak populations in Canada. According to long-term trend data from the BBS, populations in Canada declined by -4.6%/yr between 1970-2012, with more severe declines in Ontario (-5.9%/yr) during the same period (Environment Canada 2014a). Data from the second Ontario Breeding Bird Atlas also indicated a significant decline, with the probability of

observation 30% less than during the first atlas (Hoar 2007). Christmas Bird Count (CBC) data also indicate a significant decline, especially between 1980 and 1998, with the most serious declines in the Great Lakes region (National Audubon Society 2010).

While these long-term and widespread declines are concerning, it's difficult to pinpoint a single mechanism or issue responsible (Bonter and Harvey 2008). Along with Bay-breasted Warbler (*Setophaga castanea*), Cape May Warbler (*S. tigrina*) and Tennessee Warbler (*Oreothlypis peregrina*), Evening Grosbeaks are thought to target the eastern spruce budworm (*Choristoneura fumiferana*) as a prey item. For these species, there is strong evidence that changes in their distribution and population size are tightly linked to the cyclical patterns in budworm outbreaks (Venier and Holmes 2010). All four species were much more abundant in the early 1970s, and the extent of their declines in recent decades mirror declines in the severity and extent of budworm outbreaks across Canada, suggesting a critical link between the birds and their insect prey. Forests dominated by spruce and fir, which the Evening Grosbeak prefers, have also declined over much of the northeast in recent decades, due to commercial timber harvest, outbreaks of other forest pests, pollution, anthropogenic development and climate change (Ralston *et al.* 2015). Finally, grosbeak mortality can also be relatively high in winter, along roads where birds aggregate to consume grit or salt, or through window-collisions at residential bird feeders (Gillihan and Byers 2001).

Given the trend of declining population and concerns over apparent range contraction in recent decades, COSEWIC will assess the conservation status of this species at its November 2016 meeting (COSEWIC 2016). COSEWIC will then forward its assessment to the Canadian government for consideration and possibly formal listing under SARA, invoking legal protection and initiating recovery planning. Hopefully, once the mechanisms responsible for these observed declines are identified, the current population trends can be reversed, and this charismatic and boisterous bird will once again be a common and widespread member of Canada's avifaunal community.

Bobolink and other Grassland Birds

Southern Ontario is home to about 13% of the world's Bobolink (*Dolichonyx oryzivorus*) population (Ontario Partners in Flight 2008). As with other grassland bird species, the Bobolink has experienced significant rangewide declines.

Before Europeans settled eastern North America, Bobolinks would have nested in native prairies, savannahs, alvar grasslands, coastal meadow marshes, beaver meadows, burned-over areas and areas that were originally cleared for agriculture by First Nations (Askins *et al.* 2007, Riley 2013). Most such habitat was destroyed following European settlement. For example, only 2% of native tallgrass prairie remains in North America (Samson *et al.* 2004) and even less remains in Ontario.

Bobolink. *Photo: Saul Bocian*

At about the same time, European settlement also brought sizable benefits to grassland birds in eastern North America. Many species adopted large acreages of newly-created surrogate grasslands (pastures and hayfields) as nesting habitat. Though still fairly common and widespread, the Bobolink is now designated as a threatened species in Ontario as a result of strong population declines. According to BBS results from 1983 to 2013, this species has been declining by about 3.5% per year in Ontario, which is equivalent to a loss of about 69% of the population since *Ontario Birds* began.

There are several factors responsible for Bobolink declines. Chief among them is loss of breeding habitat, especially pasturelands and hayfields, which have either been abandoned outright (especially in eastern Ontario) or have been converted to other crop types, notably corn and soy, with an attendant reduced emphasis on the production of beef and dairy cattle (McCracken *et al.* 2013, Smith 2015). Habitat loss also figures prominently on the Bobolink's wintering grounds and on migration routes. In addition, there have been changes in hayfield composition that negatively affect habitat quality for Bobolinks. In particular, there has been a dramatic move from grass-based forage crops over to alfalfa (McCracken *et al.* 2013).

Poor reproductive output is also an important factor. Nest losses are unsustainably high in hayfields when the mowing period overlaps with the peak of the Bobolink's breeding season (e.g., Nocera *et al.* 2005, 2007; Perlut *et al.* 2006; With *et al.* 2008). Bobolinks also face additional threats on their South American wintering grounds, where they may be exposed to direct human persecution and to toxic effects from insecticides used on rice crops (Basili 1997, Renfrew and Saavedra 2007, Renfrew *et al.* 2007).

A recovery strategy has been developed for Ontario's Bobolinks (McCracken *et al.* 2013). But even stabilizing the population at its current level presents a major conservation challenge, because we will somehow need to address the continued loss of agricultural grasslands in the face of global market forces. Creating increased market-demand for pasture-fed beef may be part of the path forward.

In the meantime, the Bobolink's plight in Ontario is mirrored by declines in many other grassland-obligate species, including Northern Bobwhite, Barn Owl (*Tyto alba*), Short-eared Owl (*Asio flammeus*), Loggerhead Shrike (*Lanius ludovicianus*), Henslow's Sparrow, Grasshopper Sparrow (*A. savannarum*) and Eastern (*Sturnella magna*) and Western (*S. neglecta*) meadowlarks. These declines began even before the first issue of *Ontario Birds* was printed, and are mostly due to loss of grassland habitat and agricultural intensification.

Carolinian Birds

The "Carolinian Zone" is the southernmost part of Ontario and Canada, extending as far south as 42°N. It is home to numerous "Carolinian species", the Canadian ranges of which are, or were, largely confined to that area extending roughly south and west of Toronto. Carolinian bird species, occurring primarily within the United States, reach the northern peripheries of their breeding ranges in this area. Several Carolinian species have shown notable changes since 1983. These include three forest and woodland species, the Hooded Warbler (*Setophaga citrina*), Tufted Titmouse (*Baeolophus bicolor*) and Red-bellied Woodpecker (*Melanerpes carolinus*), all of which have expanded northward and the Yellow-breasted Chat, a species of early-successional woodland, the range of which is retracting southward into the US.

The Hooded Warbler, Tufted Titmouse and Red-bellied Woodpecker, have all increased by >200% between atlases. The increase in the Hooded Warbler is rather remarkable given its apparent absence or near absence from the province as a breeding species prior to 1949 (Gartshore 1988). However, its recent history has been one of steady expansion, increasing from 21 to 81 squares with breeding evidence between atlases. Its breeding distribution was largely confined to the Carolinian Zone but now includes an extra-Carolinian distribution covering at least 17 municipalities. The censused population is 436 territorial males with a total estimated population comprising 1,000 to 2,000 individuals in 2011 (COSEWIC 2012b). This expansion is consistent with the US portion of this species' range where BBS data indicate a northward shift in the breeding distribution of 115 km during a 26-year period (Hitch and Leberg 2007). The reasons for this expansion are several and include increasing habitat availability, habitat connectivity and climatic favorability (Melles *et al.* 2011).

The increases for Tufted Titmouse and Red-bellied Woodpecker have been no less dramatic. Tufted Titmouse increased from 21 to 99 squares with breeding evidence and with a change in probability of observation of around 300% between atlases (Read 2007). Although subject to West Nile Virus which resulted in locally severe rates of mortality (Ladeau *et al.*

Red-bellied Woodpecker. *Photo: Homer Caliwag*

2007), Tufted Titmouse is nevertheless reasonably fecund with relatively high fledgling survival and with dispersal of young by as much as 75 km from natal territories (Ritchison *et al.* 2015). Similarly expanding populations in adjacent U.S. states combined with high dispersal rates of fledged young and increasing winter survival due to climate change and the availability of winter bird feeders are all thought to be factors in this species' increasing population (Price 2004, Ritchison *et al.* 2015).

Perhaps more conspicuous has been the increase in Red-bellied Woodpecker over the past 30 years. Highly vocal and easily detected, it formerly was known to be a relatively rare and consummately Carolinian species in the province. Between atlases, however, it increased by more than 250% in the number of squares with breeding evidence (from 115 to 441). Moreover, both its range-edge and core range expanded northward by 112 and 32 km, respectively (Bavrlic 2007). This pattern of expansion is consistent with that observed elsewhere along the northern edge of this species' range. While expansion in the northeast began prior to 1950, it has been most dramatic since the 1970s, facilitated by climate change, the forced dispersal of young from natal territories and increased winter survival, particularly of males, through supplementary food provided by bird feeders (Kirchman and Schneider 2014).

Among Carolinian species that have declined in the past 30 years, the case of the Yellow-breasted Chat is perhaps most compelling. While never common in the province, the chat has declined substantially since 1983. Recorded in 45 squares during the first atlas, breeding evidence was found in only 27 squares during the second atlas (Eagles 2007). This declining trend has continued unabated since the atlas and the species has now largely disappeared from its former strongholds within Point Pelee National Park and on Pelee Island and appears to be near extirpation in the province as a breeding species. This decline is consistent with observations in the adjacent US states of Michigan, Ohio, Pennsylvania and New York where BBS data indicate significant declines and a general southward retraction of the species' breeding range (COSEWIC 2011).

A scant three decades ago, who would have predicted that such common and widespread species as Barn Swallow, Bank Swallow, Eastern Whip-poor-will, Common Nighthawk and Chimney Swift would have landed on the provincial list of species at risk?

Concluding Discussion

The preceding accounts help illustrate how dynamic bird populations have been since 1983 in Ontario. While definitive explanations for many of these changes are not yet available, most of the changes outlined can be attributed with varying degrees of certainty to changes brought about by humanity. Although some species have benefitted from the development of large parts of the landscape, the overall pattern has been one of decline since the 1970s, even in a place like Ontario with large undeveloped areas. The "ecological footprint" of humanity continues to expand with human population, development of the land and intensification of land-use, and changes to the climate, so that birds are subject to loss of or increasing change to their habitat and in many cases their food supply. The patterns revealed in the *State of Canada's Birds* (NABCI-Canada 2012) suggest that dealing with such extensive change may be especially difficult for migratory species, and particularly those that migrate long distances, presenting challenges to their populations and even threats to the existence of some species.

Since the first issue of *Ontario Birds* appeared in 1983, we have seen large shifts in our thinking about species at risk and conservation priorities. Back then in Ontario, we were understandably very concerned about the plight of diurnal raptors (especially Bald Eagle, Peregrine Falcon and Red-shouldered Hawk (*Buteo lineatus*)). Those worries are now largely behind us, thanks to stricter controls on pesticides, better community understanding of the importance of raptors and a couple of very successful re-introduction programs. It may sound odd today, but back then we were also quite worried about populations of Eastern Bluebirds (*Sialia sialis*). Their populations have since rebounded magnificently, owing largely to the large network of bluebird enthusiasts and their nest box programs. We have also seen remarkable population increases stemming from the expansion and maturation of woodland in southern Ontario (Larson *et al.* 1999) and eastern North America (Askins 2000), perhaps coupled with a warming climate (e.g., witness the huge expansion of Hooded Warblers and several other Carolinian species of woodland birds). Waterfowl are also largely faring better, thanks to more effective wetland protection efforts and substantial financial commitments through the North American Waterfowl Management Plan. Despite this success, marsh birds such as the Black Tern and Common Gallinule continue to decline, suggesting that some of these more specialized wetland species will require more targeted conservation efforts.

On the downside, southern Ontario has more bird species at risk than any other region of Canada. We have seen the continued decline of grassland birds across most of the province. While not common in 1983, Loggerhead Shrike, Henslow's Sparrow, Barn Owl and Northern Bobwhite were once much more widespread and even fairly "easy to find". They are all now teetering on the edge of extirpation. Although still plentiful, Bobolink and Eastern Meadowlark seem to be on the same trajectory. Arguably the biggest conservation concern that has emerged since 1983 is the decline of aerial insectivores. A scant three decades ago, who would have predicted that such common and widespread species as Barn Swallow, Bank Swallow, Eastern Whip-poor-will (*Antrostomus vociferous*), Common Nighthawk and Chimney Swift would have landed on the provincial list of species at risk?

The success of the MBCA of 1916 and a ban on the use of DDT in Canada in 1972 indicate that much can be done to rectify the changes wrought by humanity, but it will require an unprecedented effort to prevent the projected climate changes from occurring and further reducing bird populations. We sincerely hope that by the time of the 200th issue of *Ontario Birds*, some of these processes will be well underway, paving the way for a bountiful future for our birds and those who enjoy them so much.

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