

OBSERVATIONS AND COMMENTS ON BIRD MIGRATION THROUGH THE KINGSTON, ONTARIO, AREA DURING SPRING AND AUTUMN*

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1.0 Introduction

Among the 378 bird species known to occur in the Kingston Ontario area, many millions during spring either migrate through the region on their way to nesting areas located elsewhere or remain to raise their young locally. Those numbers rise by two or three fold during autumn augmented by the young of the year who join the adults for the journey southwards. Depending on the bird family, those twice yearly journeys may be executed entirely during hours of night, or entirely by day, or by a combination of diurnal and nocturnal passage. The risk to their lives by migrating is great, but on the evolutionary scale the risk must be less than trying to raise their young in areas where migration would be unnecessary.

Disasters due to weather overtaking the migrants on passage are well known and include fog, hurricanes and sudden torrential rains. Mankind has increased those risks by means of tall obstacles such as buildings, especially lighted buildings at night, communication towers, chimneys, and windmills. The use of floodlights on buildings and towers has proven disastrous. Environmental studies have led to the use of strobe or flashing lights on tall obstacles that avoids bird kills and warns aircraft rather than use floodlights.

It is helpful to put in perspective the numbers of birds that either breed within or pass through the Kingston area. Of the 378 species known to occur in our area, there is nesting evidence for 193 species. Based on the studies 2001-05, there are $(1,298,800 \pm 170,400)$ pairs among the top 20 nesting species in the Kingston area every year [1]. The total number of nesting pairs is much greater when the remaining 173 breeding species are included. Most of these species migrate to and from Kingston annually. In addition, when the species that do not breed in our area are included, the number of migrants passing through the Kingston twice per year area amounts to tens of millions.

The location of Kingston at the confluence of Lake Ontario, the St. Lawrence River and the Cataraqui River/Rideau canal system, and the offshore islands (Howe, Wolfe, Amherst, Main Ducks, the Galloos, Timber and False Ducks) exert a significant influence on the migrants that results in differences in how the birds use our area during spring and autumn migration. In general, raptors, which migrate by day, and owls that pass through by night, prefer not to cross wide water crossings and tend to avoid the obstacle by following its shoreline to seek a more continuous land route. This behaviour accounts for the reason why raptor migrants are far more numerous in the Kingston area during autumn than spring. However, nature always produces exceptions among which are the harriers and Osprey, some of whom cross Lake Ontario directly without hesitation during spring and autumn. Detailed comments on raptor

migration are left to Gerry Smith, who is well versed to address that issue during this workshop. The passage of loons, grebes, geese and ducks into and through the Kingston area may occur during the day or night. These powerful fliers are not deterred by water obstacles as they live their lives on the water. David Okines plans to focus his expert attention on these families during this workshop.

My comments and observations will include most other families of birds in our area for which I have information. Most of the birds in these families migrate by night and do not hesitate to cross water obstacles. Under a clear night sky, the birds fly at altitudes up to 500 metres. Songbirds require light to feed and therefore they do so during daylight hours. During the migration flight, they are not able to feed while flying with the exception of the swallows. Hence they have adapted to feed during day one, migrate that same night having previously accumulated fat reserves for the journey, and feed during the next day. Depending on the extent of the fat reserves, many individuals will stage and feed for a few days in a protected area such as Prince Edward Point before resuming their night flight.

In general for the Kingston region, spring passage is a rushed affair as the birds are in a hurry to establish nesting territories and raise their young. April and May see the heaviest influx of breeders and migrants. By contrast, the autumn migration is a more leisurely passage extending from late July to November with most of the insect eating passerines and shorebirds moving through during August and September, raptors during September and October, and waterfowl September to November.

2.0 Methods

The information contained in this presentation is based on my field observations gathered in the Kingston region over the past 40 years. The observations by day have been gathered systematically by me and others in the KFN from shoreline sites from Ivy Lea on the east side of the City, Kingston City, Bath Road west to Glenora, South Marysburg township to include the peninsula and its shoreline from Prince Edward Point to the west by 20 km, the offshore islands of Wolfe, Amherst, Main Ducks, Yorkshire, and Timber. In addition, the nocturnal netting programme by the KFN at Prince Edward Point over about 10 years helped define the mechanics of owl migration. The study of the bird kills at the Lennox Generating Station during the 1970s also contributed useful insights.

Night migrants call regularly in flight as a method of communicating with others within a group, as do Canada Geese, or with any other bird migrating, perhaps to help avoid collisions with each other. Song birds do not migrate in flocks but rather as lone individuals, although there are usually many other individuals of that species and other species also flying on the same night as they take advantage of ideal weather conditions. A tail wind is always helpful to increase their velocity and optimise their use of energy. The call notes uttered by a number of species are distinctive especially the herons, shorebirds, thrushes and some sparrows, and they can be readily identified by an experienced observer. However, the call notes of many species, especially flycatchers, warblers and vireos, are very similar and identifying the species by their squeaks and peeps by night requires recording the calls and subsequently de-convoluting the sonogram, which in turn requires sophisticated equipment.

During spring and autumn passage, I have gathered the nocturnal data by counting the number of calls passing overhead within a 10 or 15 minute period during every hour from about 2300 h to 0600 h on those nights when migration was in progress. Species assignment was made for several species that are easily identified. Those that could not be identified with respect to species were lumped together as 'birds heard per hour' passing the listening post. Those listening posts were mainly at shoreline sites on the eastern, central and western areas of Kingston City, Bath Road and Prince Edward Point. A few sites were chosen north of Kingston City away from settlement.

The calls of a single individual could be heard within about 200 metres in all directions of the listening station. Duplicate counting of an individual was avoided or minimised as each migrant called regularly and its path overhead was readily followed as the bird approached from the north, passed overhead and moved away towards the south. At the hours of listening, interfering noise was minimum and usually arose from an occasional train heard at some distance from the listening post.

3.0 Results and discussion

During the spring and autumn migration periods, the northwards and southward bound migrants, respectively, appear to distribute themselves along a broad front as they pass over the Kingston area. There is no evidence based on the nocturnal results that the birds follow a narrow flyway through our region. In addition, during both of these migration periods, the migrants appear to shift to lower flying altitudes that is especially apparent as dawn approaches, perhaps a move related to seeking out a ground refuge as they prepare to end the night flight.

Geographical features concentrate the birds as dawn overtakes them and brighter light becomes available. The birds clearly seek land sites for sanctuary, rest and food. During both seasons, the shoreline vegetation of the Kingston mainland, the offshore islands, the peninsula of South Marysburgh township all the way west towards Pt. Petrie are prime sites where large numbers of migrant birds concentrate at dawn. At Prince Edward Point, the geographical features of the land extending out into Lake Ontario act as a funnel where tens of thousands of migrants can be found.

Weather conditions during the night flight play a significant role for the migrants in terms of their flight altitude. Nights with low cloud force the migrants to low altitudes and increase the chances of a collision with a tall man-made obstacle. When foggy or rainy conditions are encountered, confusion results as the birds seek out artificial lighting perhaps as a possible corridor through the confusion. This situation usually results in collision with an obstacle and in collisions with each other. The urge to migrate is very strong and they continually try to push onwards.

The numbers of migrants passing a listening post vary depending on the particular night, the date within the migration period and weather conditions. During April and May, the birds per hour passing the listening post number up to 3,600 per hour and are greatest during mid-May. The total numbers per hour passing during autumn are much greater on most nights, up to 50,000 per hour, and for many more nights through the season.

Shown in Table 1 (1983-2007) and Table 2 (2008-2010) are night flight summaries for the Gray-cheeked Thrush and Swainson's Thrush (SWTH). These two species are highly migratory. They neither nest nor over winter in the Kingston region. These numbers are remarkable as they are from one listening post only and the linear distance of sky covered is about 400 metres. On some of those same nights, similar numbers were recorded at a second listening post located 5 km to the east within Kingston City. If the density were similar along the 5 km interval between the two stations, then the numbers of passing is very large.

To appreciate the magnitude of the passage, let us take for example the Swainson's Thrush data for overnight 09-10 Sep 2010 when 18,000 per 400 metres of flight front passed the one lookout during the 5 hours of listening. With same density of flight between the two listening posts separated by 5 km, there would have been 18,000 SWTH per 400 m x 5000 m = 225,000 Swainson's Thrushes passed over during the night. There were 10 other birds passing per hour for every Swainson's Thrush so there were approximately 2.25 million migrants that flew over that night. It would be interesting to know how far along the north shore of Lake Ontario that the same density of flight existed.

The Kingston area is only one of many developed areas along the flight path through which the migrants must pass before they reach their destinations in Central and South America. The urbanisation through the eastern USA is far more intense than in eastern Ontario. The cumulative effect of the kills at various obstacles is substantial and not fully appreciated.

During the early stages of planning for installation of windmills on Wolfe Island, the KFN provided the Ontario MNR and Environment Canada with factual information with respect to the sites on Wolfe Island where bird casualties would likely be the greatest. It appears that this advice was totally ignored by the company undertaking the installation and therefore there should be no surprises about the casualties that are resulting. Sound environmental advice has the potential to minimise the environmental impact in all aspects of development. Unfortunately it appears that only lip service is paid to these concerns.

Reference

1. Weir, R.D. Birds of the Kingston Region, 2nd ed, Kingston Field Naturalists, 2008, 611 pp.

TABLE 1**Nocturnal flights over Kingston by Swainson's Thrush and Gray-cheeked Thrush 1983-2007**

Overnight Date	Listening Hours	Gray-cheeked Thrush		Swainson's Thrush		Overnight Date	Listening Hours	Gray-cheeked Thrush		Swainson's Thrush	
		Birds per hour	Total Birds	Birds per hour	Total Birds			Birds per hour	Total Birds	Birds per hour	Total Birds
03-04 Sep 83	6	1,000	6,000	0	0	28-29 Sep 02	5	400	2,000	4,000	20,000
14-15 Sep 87	6	1,100	6,600	120	720	15-16 Sep 03	5	30	150	1,000	5,000
10-11 Sep 89	8	60	480	600	4,800	16-17 Sep 03	5	100	500	3,000	15,000
17-18 Sep 91	8	300	2,400	3,000	24,000	21-22 Sep 03	5	20	100	1,000	5,000
08-09 Sep 92	5	0	0	500	2,500	25-26 Sep 03	5	20	100	2,000	10,000
19-20 Sep 92	5	240	1,200	300	1,500	28-29 Sep 03	5	300	1,500	4,000	20,000
04-05 Sep 93	5	0	0	20	100	10-11 Sep 04	4	50	200	5,000	20,000
14-15 Sep 94	6	120	720	2,000	12,000	12-13 Sep 04	4	0	0	4,000	16,000
24-25 Sep 94	6	300	1,800	3,600	22,000	19-20 Sep 04	5	300	1,500	3,600	18,000
14-15 Sep 95	6	100	600	1,800	10,800	22-23 Sep 04	5	600	3,000	6,000	30,000
09-10 Sep 96	6	0	0	1,650	9,900	14-15 Sep 05	3	100	300	3,000	9,000
21-22 Sep 96	8	30	240	1,200	9,600	15-16 Sep 05	3	300	900	7,000	21,000
07-08 Sep 97	7	100	700	250	1,750	05-06 Sep 06	4	0	0	100	400
12 -13 Sep 97	6	70	420	350	2,100	16-17 Sep 06	6	200	1,200	7,200	43,200
13-14 Sep 97	6	65	390	2,100	12,600	19-20 Sep 06	5	0	0	800	4,000
08-09 Sep 99	8	50	400	550	4,400	20-21 Sep 06	6	600	3,600	7,000	42,000
11-12 Sep 99	4	0	0	25	100	24-25 Sep 06	5	700	3,500	5,000	25,000
12-13 Sep 00	5	60	500	7,200	36,000	08-09 Sep 07	3.5	60	210	720	2,520
17-18 Sep 00	5	60	300	3,000	15,000	20-21 Sep 07	6	200	1,200	1,800	10,800
10-11 Sep 01	5	120	600	3,600	18,000	22-23 Sep 07	4	75	300	1,500	6,000
15-16 Sep 02	5	0	0	1,000	5,000	26-27 Sep 07	3	none	none	2,400	7,200
24-25 Sep 02	5	200	1,000	2,000	10,000						

TABLE 2**Nocturnal flights over Kingston by Swainson's Thrush and Gray-cheeked Thrush 2008-2010**

Overnight Date	Listening Hours	Gray-cheeked Thrush		Swainson's Thrush		Overnight Date	Listening Hours	Gray-cheeked Thrush		Swainson's Thrush	
		Birds per hour	Total Birds	Birds per hour	Total Birds			Birds per hour	Total Birds		
06-07 Sep 08	4	0	0	200	800	09-10 Sep 10	5	200	1,000	3,600	18,000
09-10 Sep 08	6	0	0	700	4,200	10-11 Sep 10	6	0	0	750	4,500
15-16 Sep 08	5	100	500	1,000	5,000	19-20 Sep 10	6	360	2,160	1,500	9,000
23-24 Sep 08	4.5	0	0	300	1,350	20-21 Sep 10	6	300	1,800	1,200	7,200
02-03 Oct 08	4.5	100	450	1,000	4,500	30 Sep-01 Oct 10	6	360	2,160	1,500	9,000
12-13 Sep 09	6	0	0	600	3,600						
13-14 Sep 09	6	0	0	1,200	7,200						
15-16 Sep 09	6	300	1,800	1,500	9,000						
23-24 Sep 09	6	720	4,320	5,400	32,400						
28-29 Sep 09	6	40	240	200	1,200						