

## BIRD MORTALITY AT WIND TURBINES AND CITY TOWERS

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Consistent with the schedule for post-construction monitoring outlined in the Post-Construction Follow-Up Plan for Bird and Bat Resources for the Wolfe Island Wind Plant, mortality monitoring was carried out by employees of Wolfe Island Wind Monitoring, an independent consulting firm, according to a schedule and methods prepared by Stantec. The results of these surveys were presented in seven monitoring reports covering the periods: May-Jun 2009, Jul-Dec 2009, Jan-Jun 2010, Jul-Dec 2010, Jan-Jun 2011, July-Dec 2011 and Jan-Jun 2012. In addition to carcass searches, trials to determine various corrective factors for searcher efficiency and scavenging rates were conducted during each of these monitoring periods.

Large raptors were collected during each reporting period and the table below indicates the dates for seven species.

**Table 1: Dates for reported mortality for several raptors**

Rough-legged Hawk	Red-tailed Hawk	Osprey	Turkey Vulture	American Kestrel	Merlin	Northern Harrier
16-Mar-11	14-Jul-09	3-May-10	11-Aug-09	1-Jul-09	31-Aug-09	13-May-10
28-Mar-11	11-Nov-09		14-Aug-09	31-Aug-09		
11-May-11	17-Nov-09	2-May-11	30-Sep-09			17-Mar-12
	8-Feb-10	23-May-11	3-Nov-09			
27-Mar-12	9-Apr-10		9-Nov-09			
13-Apr-12	14-Apr-10	3-May-12	18-Nov-09			
	15-Apr-10	14-May-12				
	16-Apr-10					
	17-May-10		2-Sep-10			
	10-Jun-10					
	28-Oct-10		19-Jun-12			
	28-Mar-11					
	1-Apr-11					
	1-Jul-11					
	29-Aug-11					
	20-Dec-11					
	3-Apr-12					
	17-May-12					

From the dates of collection, all five Ospreys would be nesting birds. The five Rough-legged Hawks are wintering raptors which do not nest in the Kingston area. Approximately half of the eighteen Red-tailed Hawks and half of the eight Turkey Vultures would be nesting birds. The other half would be migrating or wintering birds.

Also, Bobolink, a species at risk in Ontario, Wilson’s Snipe and Purple Martin have been found in large numbers during these surveys (Table 2)

**Table 2: Dates for reported mortality for Snipe, Bobolink and Martin**

Wilson's Snipe	Bobolink	Purple Martin
9-Jun-09	28-May-09	29-Jun-09
18-Jun-09	23-Jun-09	
	27-Jul-09	12-Aug-09
13-Apr-10	30-Jul-09	12-Aug-09
14-Apr-10	31-Jul-09	17-Aug-09
21-Apr-10	4-Aug-09	4-Sep-09
22-Apr-10	11-Aug-09	4-Sep-09
23-Apr-10	27-Aug-09	9-Sep-09
26-Apr-10	27-Aug-09	9-Sep-09
25-Jun-10	10-Sep-09	
	8-Jun-10	10-Aug-10
1-Dec-10	23-Jul-10	26-Aug-10
	12-Aug-10	27-Aug-10
18-May-11	3-May-11	2-Sep-10
20-May-11	12-May-11	10-Sep-10
14-Jun-11	16-May-11	
	13-Jul-11	28-Jul-11
18-Jun-12	20-Jul-11	6-Sep-11
	29-Jul-11	6-Sep-11
	22-Aug-11	
	16-May-12	
	28-May-12	
	18-Jun-12	

The 23 Bobolinks are a very high number. From the Breeding Bird Survey of Ontario, the density of nesting pairs is estimated at 6 per square kilometer south of the Canadian Shield (R. D. Weir, *Birds of the Kingston Region*). Therefore, the total population on Wolfe Island should be of the order of a thousand birds, approximately five hundred of which would be found in the western portion of the island where the turbines are concentrated.

These numbers represent the birds that were collected. To estimate the actual birds killed, the numbers must be multiplied by a factor that is calculated from the searcher efficiency, the scavenging rates and the percentage of the area searched. These were determined during the monitoring overseen by Stantec and result in a factor of two for raptors and a factor of six for all other birds.

Therefore, we can estimate that approximately 150 Bobolink have been killed by turbines during the reporting period of three years. Hence, in the western portion of the island, approximately 10% of the population falls victim to the blade every year.

The Wilson Snipe is four times less abundant than the Bobolink in our area so the reported mortality (14 birds) is also significant for that species.

Purple Martins congregate at the swallow roost on Wolfe Island in late summer. Several hundred gather in Bayfield Bay. All 16 recorded mortality occurred during this roosting period.

Birds also suffer casualty from collision with buildings, from predation, hunting and other causes. Fatal Light Awareness Program (FLAP) has documented over 46,000 birds as victims of collisions with Greater Toronto Area (GTA) towers between 1993 and 2009. Several species at risk are found in large numbers in the list tabulated by FLAP (Michael Measure, private communication). Nearly 200 Canada Warblers, 180 Bay-breasted Warblers, 132 Blackpoll Warbler, 456 Black-throated Green Warblers and 336 Wilson Warblers have been collected during that time period. Clearly, the mortality due to collision with towers is significant for passerines.

However, large raptors, snipes, bobolinks and purple martins have not been found to be victims of collision with towers. Over seventeen years, one Northern Goshawk and one Red-tailed Hawk have been collected. No snipes or purple martins have been collected and only three bobolinks have been found.

It is clear that lighted structures are a real risk to migrating passerines and city dwellers like the Peregrine Falcon but present a lesser danger than wind turbines for the species highlighted in this summary.