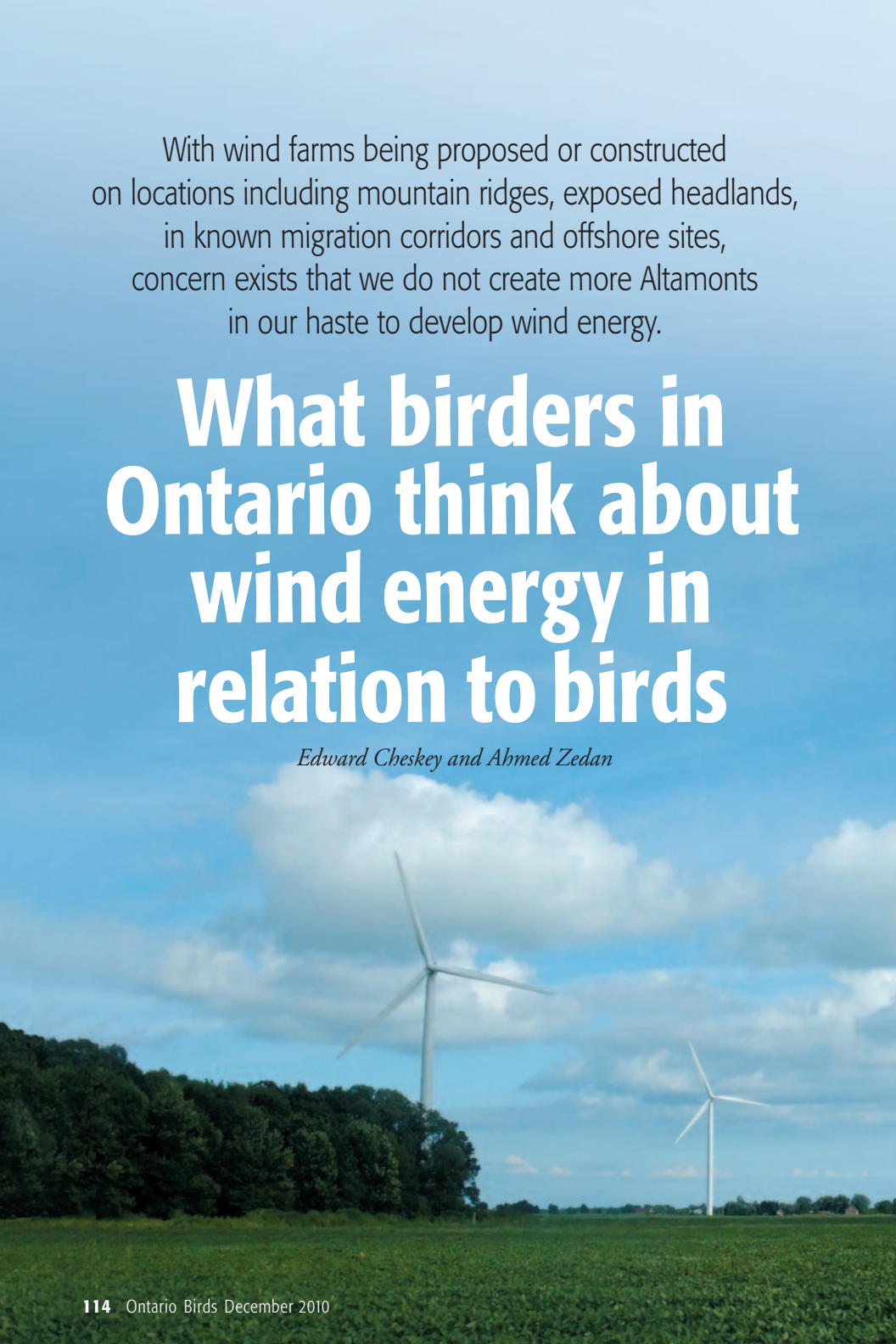
With wind farms being proposed or constructed on locations including mountain ridges, exposed headlands, in known migration corridors and offshore sites, concern exists that we do not create more Altamonts in our haste to develop wind energy.

What birders in Ontario think about wind energy in relation to birds

Edward Cheskey and Ahmed Zedan



Introduction

Fossil fuels, as a major source of energy, have come under a lot of criticism in recent years as science unveils their contribution to global warming. In addition to the effects on climate change, and the fact that they are non-renewable finite resources, the exploration, extraction and production of fossil fuels has been proven to have detrimental effects on other components of the environment: soil, water and wildlife. As a result, renewable energy has been regarded as necessary to address these increasing concerns. Wind, one of the various natural sources of renewable energy, offers a greener solution that generates fewer carbon dioxide emissions and has fewer impacts on the environment.

Assessment of the impacts of wind energy installations has focussed on bird mortality caused by collisions with blades (de Luca *et al.* 2007), and more recently bat mortality from biotraumas, (calculated as birds(or bats)/turbine/year or more recently birds(bats)/MW/year). Concerns have also been raised about loss of habitat from installations (impact on breeding birds from the footprint of a turbine, including servicing roads, underground cables and transformer stations), displacement of migratory routes

Wind farm near Port Burwell, Ontario.
Photo: Ted Cheskey

through avoidance of wind farm installations and vibration noise (see "Mortality Threats to Birds – Wind Turbines" on the American Bird Conservancy website). Although the impact of wind farms on birds to date has been conveyed as relatively minor, there are a few notable exceptions, such as the Altamont Wind farm in California (Thelander and Smallwood 2007) and some of the wind farms in Spain (Lekuona and Ursua 2007). Recent data from the controversial Wolfe Island wind plant near Kingston, Ontario, has raised concerns that it may join the ranks of the most damaging wind plants in North America (TransAlta Corporation 2010).

In the simplest terms, monitoring the impact of active turbines on birds typically involves regular searches for corpses beneath the turbines.

There are several layers of complexity to this issue, particularly related to monitoring. In the simplest terms, monitoring the impact of active turbines on birds typically involves regular searches for corpses beneath the turbines. Monitoring is often a condition attached to project approvals, at least for the first few years of operation. Most wind producers do not publish the studies and methodologies used to arrive at their mortality estimates, and are under no obligation to do so. The data we gathered in this paper (see Table 1) were derived from research studies, consulting firms' monitoring plans, and wind developer presentations. Stantec's study for TransAlta, of the first six months of operations of the Wolfe Island turbines, is a good example of corporate due-diligence, with respect to birds at least, in the wind energy sector.

Normally, the monitoring is done for the wind farm operator by a contracted field biologist or birder. The challenges of monitoring over open water are obvious and not easily resolvable — it is harder if not impossible, to conduct offshore body counts around the turbines as is done on the land. However, a recent technology developed in Europe, that is being employed at the Cape Wind project off Massachusetts, the first approved offshore wind plant in the United States, may overcome some of the challenges and make some elements of offshore monitoring more feasible. One example of such technology is the infrared collision-detection system developed by Denmark's National Environmental Research Institute, the Thermal Animal Detection System (TADS). While this technology is a big step forward, the high cost of the units and the unresolved issue of identifying casualties remains, meaning that, at best, it provides only a partial solution to this issue.

Often, proponents of wind farms point out that mortality rates from wind farms rank far below those resulting from tall buildings, vehicles and house cats (see "What Kills Birds" on Curry and Kerlinger website). However, the birds that collide with tall buildings, or are killed by house cats, are not necessarily the same species as the casualties of the wind turbines, as the Wolfe Island data has demonstrated (TransAlta Corporation 2010). The species most impacted during the first six months of the Transalta wind farm on Wolfe Island were Tree Swallow

Table 1. Reported avian fatality rates in Canadian and US wind farms

Project Name	Location	Capacity (MW)	No. of Turbines	Fatality Rate (birds/turbine/year)
CANADA				
[1]Erie Shores Wind Farm	ON	99	66	0.41
[2]Prince Wind Power Project (estimate)	ON	189	126	0.39
[3]Pickering	ON	1.8	1	3
[3]Exhibition Place	ON	0.75	1	2
[2]Melancthon 1 Wind Plant (estimate)	ON	133	200	1.4
[4]Chin Chute Wind Farm	AB	30	20	1.55
[5]Taber	AB	80	37	2.42
[5]Kettles Hill	AB	63	35	2.69
[3]McBride Lake	AB	75.24	114	0.36
[3]Magrath	AB	30	20	2.62
Summerview	AB	70	39	1.9
[1]Castle River	AB	44	60	0.19
[3]Cypress Wind Power Facility	SK	10.56	16	1.4
[6]Le Nordais	QC	99.75	133	0
Average				**1.52**
[3] **UNITED STATES**				
Altamont	CA	167.86	1,526	0.791
Diablo Winds	CA	20.46	31	1.19
High Winds	CA	162	90	2.31
San Gorgonio	CA	456.785	2,947	0.042
Tehachapi	CA	0.1274	637	0.071
Ponnequin	CO	31.24	44	0.155
IDWGP	IA	2.25	3	0
Top of Iowa	IA	80.1	89	0.646
Princeton	MA	0.32	8	0

Project Name	Location	Capacity (MW)	No. of Turbines	Fatality Rate (birds/turbine/year)
Buffalo Ridge I	MN	24.82	73	0.884
Buffalo Ridge II	MN	107.25	143	2.27
Buffalo Ridge III	MN	103.5	138	4.45
Copenhagen	NY	0.68	2	0
Madison	NY	11.55	7	0.571
Klondike	OR	24	16	1.44
Vansycle	OR	25.08	38	0.632
Meyersdale	PA	30	20	0.925
Somerset	PA	10.4	8	0
Buffalo Mountain	TN	1.98	3	9.33
Searsberg	VT	5.94	11	0
Nine Canyon	WA	48.1	37	3.59
Stateline	WA/OR	299.64	454	1.93
NE Wisconsin	WI	20.46	31	1.29
Mountaineer	WV	66	44	2.59
Foote Creek Rim	WY	41.4	69	1.49
Average				**1.464**

[1] Holder, 2008.
[2] Invenergy Canada, 2009.
[3] Barclay, *et al.*, 2007.
[4] Glendinning, 2008.
[5] Enmax Corporation, 2008. (includes birds and bats combined)
[6] Kingsley and Whittam, 2005.

(*Tachycineta bicolor*), Bobolink (*Dolichonyx oryzivorus)*, Purple Martin (*Progne subis*) and Turkey Vulture (*Cathartes aura*). These species do not show up on the Fatal Light Awareness Program (FLAP) list of birds from building strikes, nor are likely frequent victims of house cats, though rural cats may prey on Bobolinks. With wind farms being proposed or constructed on locations including mountain ridges, exposed headlands, in known migration corridors, and offshore sites, concern exists that we do not create more Altamonts in our haste to develop wind energy. Clearly, all of these impacts require our collective attention, and where we can, as a society, we should be mitigating those actions that we know are damaging to wildlife.

One thing that seems clear about wind farms and their impact on birds is that each case is different and what happens in one area cannot be applied to other areas. A look at some mortality data (Table 1)

demonstrates that most projects report very low casualty rates.

With the recent passing of the Ontario Green Energy Act, the number of wind installations in the province will increase dramatically. Wind energy producers are proposing wind farms wherever there is wind, which of course includes many areas that are well-known for their significance to birds. The Ontario government is scrambling to put in place regulations to manage the development of offshore wind projects.

In 2009, proposals for wind farms in or near globally significant Important Bird Areas around Point Pelee and on Prince Edward Point caught the attention of some naturalist groups and conservation organizations, including Nature Canada and Ontario Nature (the South-Point Wind proposal for 15 turbines in Pigeon Bay, 2009, and the Gilead proposal for 12 turbines near Prince Edward Point National Wildlife Area, 2009). Indeed, concerns over potential impacts on birds of these two proposals prompted this survey. The purpose was to ask birders in Ontario for their opinions on wind energy, whether they had concerns about the impact of wind farms on birds, and how they felt about the presence of wind farms at two of the most popular birding locations in the province. From the perspective of Nature Canada, our interest in conducting the survey was also to raise awareness in birders of this issue.

However, this survey was not intended as an in-depth or scientific review, but more an initial exploration of this issue with a hope that it would encourage people to look at issues more closely. By increasing understanding of potential impacts to birds we may help to limit or reduce the ways in which we impact them.

Methods

In September and early October 2009, 264 birders from across Ontario, and a few beyond, completed an online survey about their perception of modern wind energy projects (usually called "wind farms") and the impact of these installations on birds.

OntBirds, the Ontario Field Ornithologists list-server was used as the primary distribution tool on 21 September, in addition to some untracked viral spreading of the survey by e-mail. Survey

Top of a modern wind turbine.
Photo: Ted Cheskey

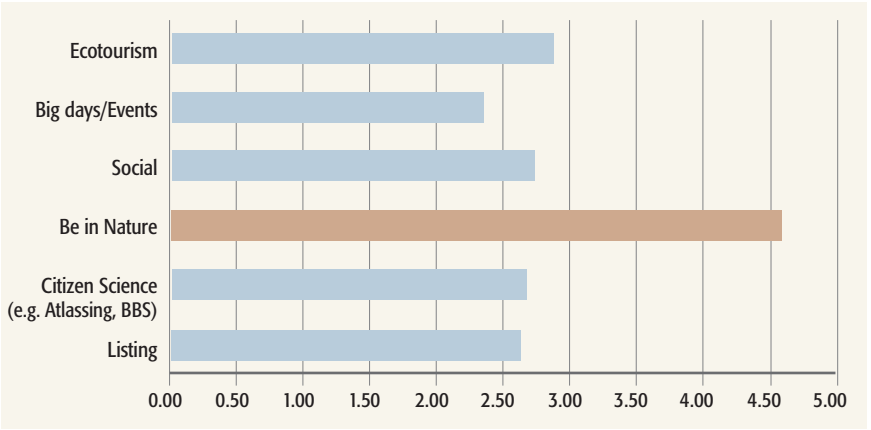


Figure 1. Motivation to go birding (rank) 1 (low) to 5 (high)

Monkey, a web-based polling or survey tool (www.surveymonkey.com), was used to gather survey responses. Two groups of questions were asked. The first group of questions was for the respondents to describe themselves and their interest in birding. The second set was to elicit opinion on some general topics such as climate change, and specifically on wind energy, and whether turbines should be allowed near significant bird sites.

Results

About the respondents:

- 264 surveys completed
- All but three respondents were from Ontario
- Gender of respondents: 42% female; 58% male
- 56% have birded for more than 20 years and 90% for more than five years
- "**to be in nature**" was by far the strongest motivation to go birding, independent of education and income (Figure 1).

Birders are known to be motivated by different activities and in our attempt to get a better understanding of their source of motivation we found that one of the categories offered in Figure 1 — being in nature — was ranked the highest. This was consistent in all income and education categories. However, there does appear to be a relationship between education and citizen science, suggesting that citizen science projects are an increasing motivation as the level of education increases.

When asked about their travel habits for birding, most respondents said that they go on at least one over-night trip annually and have travelled long distances to go birding (Table 2). Likewise most respondents do not only bird locally, but also bird by car. The only exception was the lowest income earners who avoid using their cars for birding locally.

Responses to the question "the last time I went birding was" demonstrates that Ontbirds respondents are very active and bird on a regular basis, 62% within the week and 85% within the month.

Table 2. Travel habits related to birding

Answer Options for Travel Habits	Yes (%)	No	Response Count (Total number of respondents)
I only bird locally	63 (25.5)	184	247
I go on at least one over-night birding trip annually	179 (74.9)	60	239
I have travelled long distances (over 1000 kilometres) to go birding	162 (66.1)	83	245
My big days always involve a lot of driving	78 (35.0)	145	223
I try to avoid using my car when I go birding if possible	81 (34.9)	151	232

Table 3. Statements to which birders agreed or disagreed to

Agree or disagree with the following statements:

Answer Options	Agree (%)	Disagree (%)	Not sure	Response Count
I support wind energy in Ontario	149 (57.5)	57 (22.0)	53	259
Wind turbines have almost no impact on birds	48 (18.6)	142 (55.0)	68	258
Offshore wind turbines should be encouraged in all windy areas of the Great Lakes	64 (24.5)	115 (44.1)	82	261
It is important to me that we reduce our consumption of fossil fuels	239 (91.9)	10 (3.8)	11	260
Global warming is an issue that is of great importance to me	216 (83.1)	24 (9.2)	20	260
Wind farms should not be located in or near Important Bird Areas or migration bottlenecks	182 (70.3)	26 (10.0)	51	259
Wind farms are a tourist attraction that I would travel to see	19 (7.3)	226 (87.3)	14	259
			answered question	261
			skipped question	3

Opinions on wind farms and birding

One series of questions asked birders to agree or disagree with a number of provocative statements. The question was not asked if the respondent had actually visited or observed a wind farm, but given the number of wind projects in Ontario, and their visibility in places like Wolfe Island, Port Rowan – Port Burwell, Bruce County, Shelburne and Toronto's Exhibition Place, it is assumed that most birders would have observed wind turbines.

There are many stories in these results. On the two questions related to global warming, Ontario birders are strongly concerned about global warming and the vast majority of respondents (92%) consider it important to reduce consumption of fossil fuels. The concern for global warming appears to translate into strong support for wind energy from nearly 60% of respondents, with only about 20% not supporting wind energy. Despite the support for wind energy, approximately 55% of the respondents believe that wind energy impacts birds, and an even stronger proportion (70%) believe that wind projects have no place in important bird areas or in avian migratory corridors. The message from our sample of Ontario birders is fairly clear — let's have wind projects in Ontario, and reduce dependence on producing energy from fossil fuel combustion, but not in a way that will have detrimental impacts on birds.

With wind farms proposed in or near two of the iconic birding locations in Ontario, Point Pelee National Park and Prince Edward Point National Wildlife Area, we asked the birders if the presence of a wind farm at these birding hotspots would discourage them from continuing to go birding there.

Roughly half of our respondents disagreed with the statement that the presence of a wind farm would discourage them from visiting Point Pelee or Prince Edward Point. Approximately 37% of the respondents agreed with the statement.

Wind farm near Shelbourne, Ontario. *Photo: Ted Cheskey*

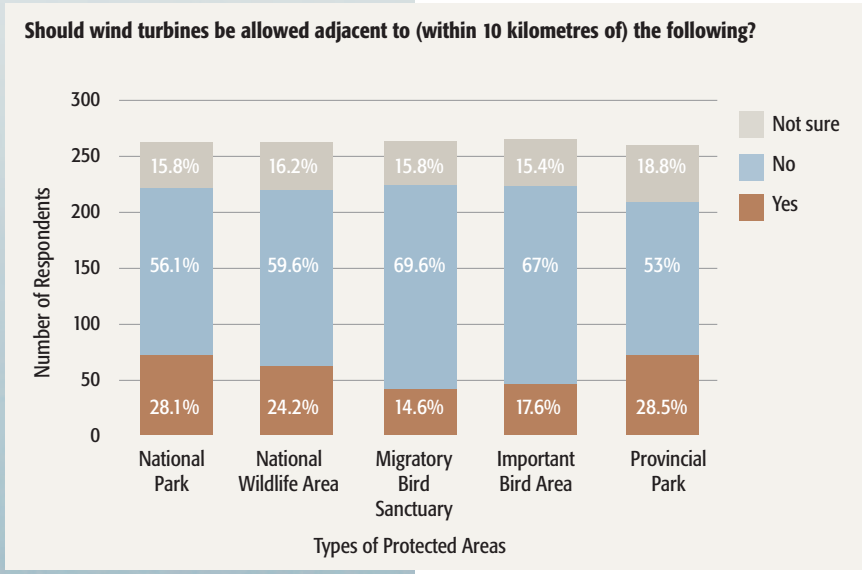


Figure 2. Birders opinions with respect to the location of wind farms.

While the result could be interpreted as confirming that most birders would not be dissuaded from pursuing their passion at their preferred places, a substantial number of respondents, over one-third, would, in fact, be discouraged. From the point of view of visitation to these locations, where birding tourism, also known as avitourism, brings significant dollars into the community, such a result could represent the loss of a significant number of visitors.

The last question asked birders where wind farms should or should not be allowed, and just how close to sensitive natural areas these features should be located (Figure 2).

In ranked order of agreement, respondents felt wind farms should not be located near Migratory Bird Sanctuaries (69.6%), Important Bird Areas (67%),

National Wildlife Areas (59.6%), National Parks (56.1%), and at Provincial Parks (53%). Of note is a comment made by a number of respondents that though they may have answered yes to some of these questions, they added that ten kilometres was too great a distance for the buffer, and if the question had used a different number, perhaps five for example, they may have answered differently.

Most birders recognize that wind energy in the wrong place can pose a threat to bird populations.

Interestingly, Migratory Bird Sanctuaries (MBS) do not represent the most significant locations for birds, but rather a category of protected area within Environment Canada's protected area network. Most MBSs are not recognized based on scientific evaluation, but rather based on a local request or interest — a proportion of them are owned privately. Though a type of federal protected area, MBSs are only accorded protection during the seasons when birds are present — the habitat is not protected per se. The International Union for the Conservation of Nature (IUCN) lists a majority of Canada's MBSs as category IV protected areas (this IUCN category includes areas that are intended to "protect particular species or their habitats", with active management interventions being required to maintain habitats or site suitability for particular species. Management of category IV protected areas may be generally focused on restoring natural areas that have experienced "substantial modification").

Important Bird Areas (IBA), a program of BirdLife International, to identify and recognize the most important places for birds on the globe (delivered in Canada by both Nature Canada and Bird Studies Canada in partnership) is the only program specifically focused on significant sites for birds. National Wildlife Areas (NWA), another type of protected area administered by Environment Canada, are owned by the federal government and have a higher degree of protection, though they are managed more flexibly than a park for example, and in some, controversial industrial activities can take place (e.g. CFB Suffield where over 1,000 natural gas wells are proposed).

Conclusions

Based on the sample from this study, Ontario birders reflect a fairly wide spectrum of interests, income and education, yet share similar concerns about climate change and global warming, and generally see wind energy as an important industry to combat this threat. However, most birders recognize that wind energy in the wrong place can pose a threat to bird populations. The wrong place includes Migratory Bird Sanctuaries, Important Bird Areas, National Wildlife Areas and national or provincial parks. Some birders, over one-third of those sampled here, said they would be discouraged from visiting the iconic birding locations of Point Pelee or Prince Edward Point if wind farms were built near them.

Ontario is on the cusp of major wind energy developments. In June 2010, the province proposed regulations to open up the development of off-shore wind farms.

The government is proposing a five kilometres buffer around all of the Great Lakes shorelines and major islands for example. These regulations are part of the approvals process of the Green Energy Act, which passed into law this past year, and is designed to lift many of the bureaucratic barriers to developing green energy projects such as wind farms (*Green Business* article, September 2009).

We believe that birders in Ontario have a special interest in the airspace through which our birds pass and could be interested in expressing their views about how wind energy is rolled out in Ontario.

Acknowledgements

Nature Canada and Ontario Nature wish to thank respondents for taking the time to do this survey and contributing many very thoughtful comments which were not necessarily captured in this report. We would also want to thank the OFO Board of Directors for supporting this study.

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