
Will you help save Arran Lake?

This site is entirely inappropriate for industrial wind turbine development

Beautiful Arran Lake has been targeted for a 46, 2.5 mw turbine wind energy project by **foreign multinationals**, Mesa Energy (T. Boone Pickens of Texas) and General Electric with Leader Resources. There are at least 4 more proposals for our township.

This is one of Bruce County's most important community assets for recreation (camping, fishing, photography and boating), nature study (Huron Fringe Festival events) and tourism.

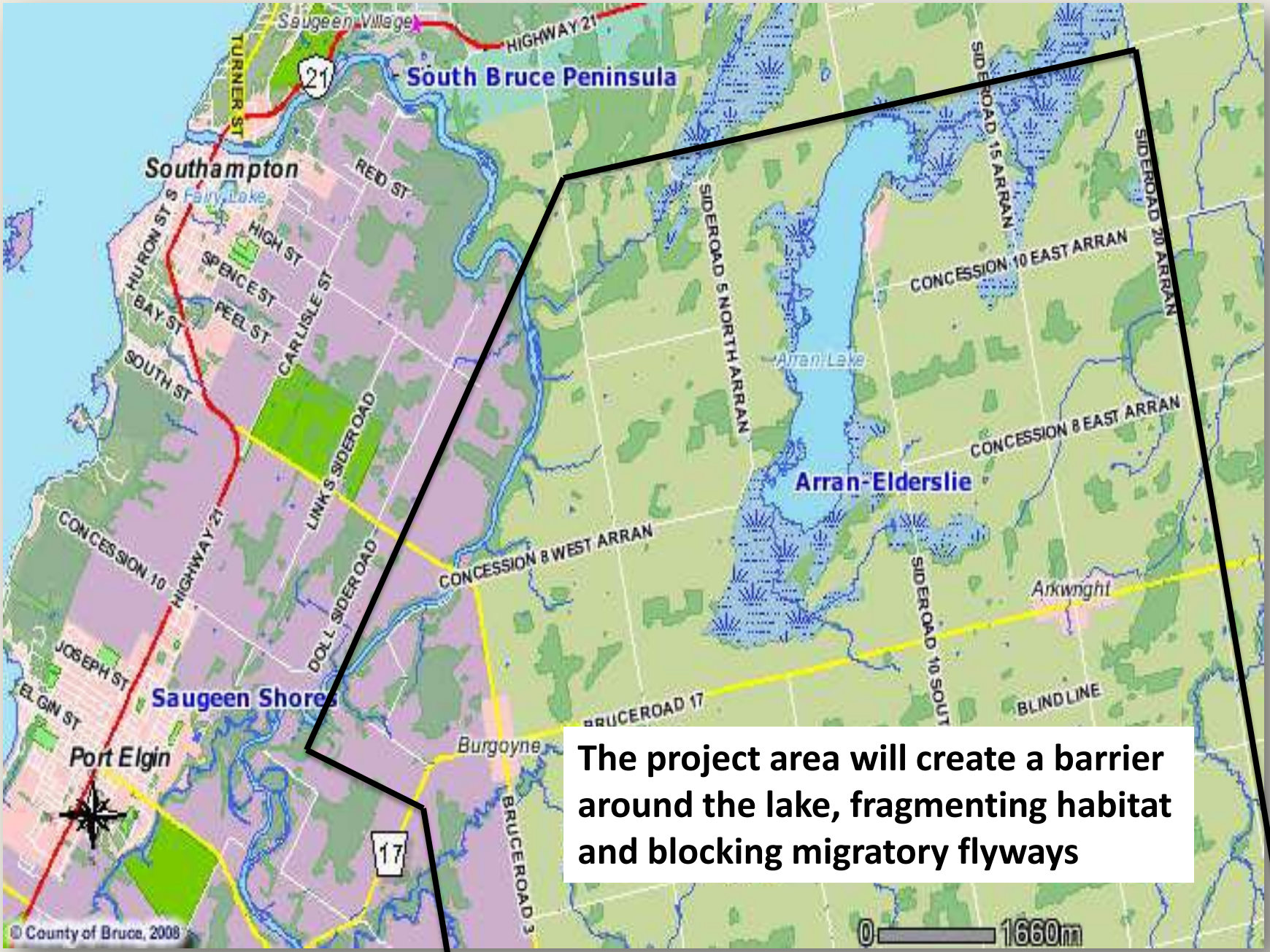
Why is Arran Lake special?

•**A provincially significant wetland complex** made up of 3 separate wetlands of great diversity and unusual size (1235.6 hectares)

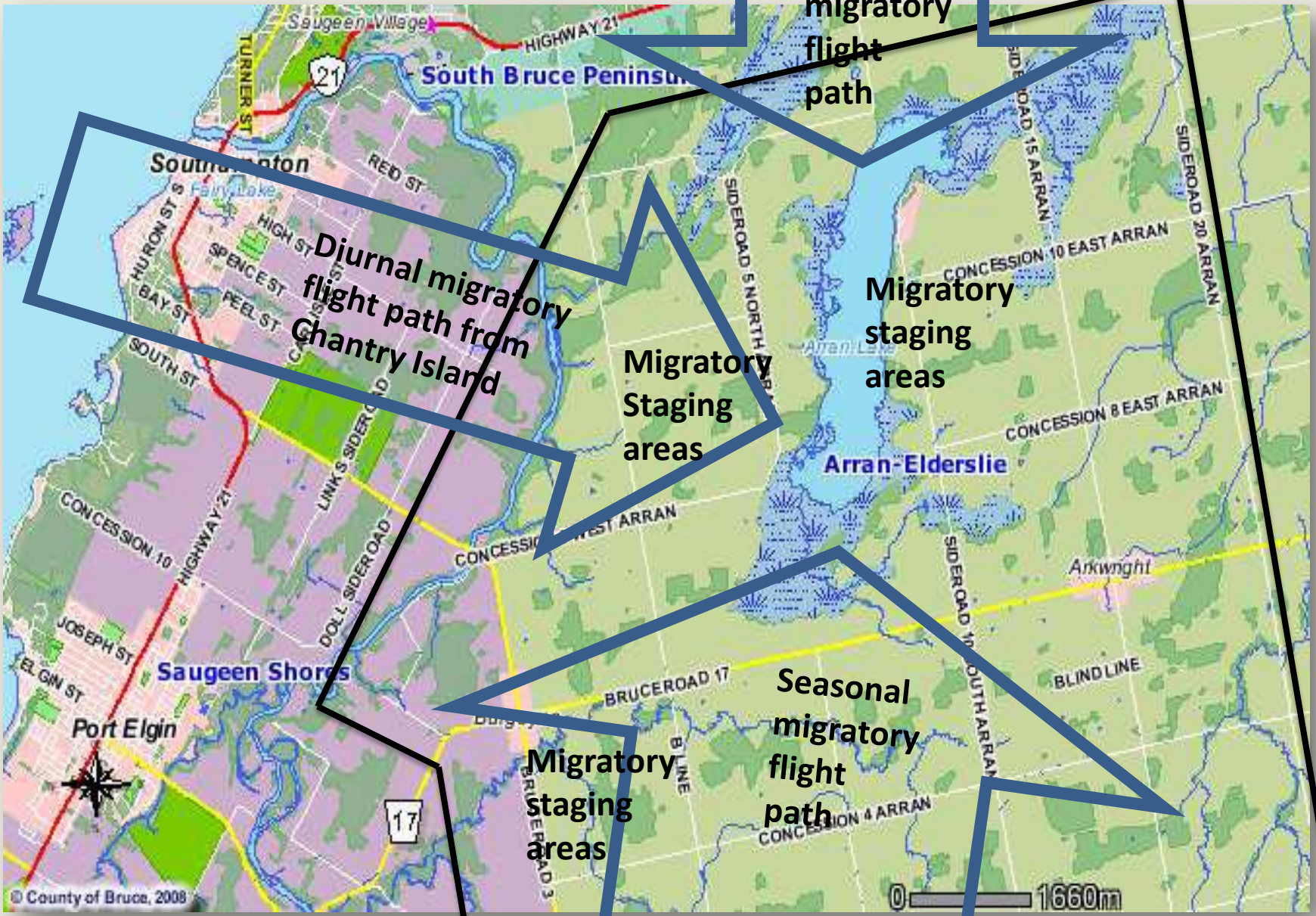
•International **migratory bird corridor and staging area**

•The wetlands and surrounding uplands are home to **24 threatened, endangered or species of special concern**


ARRAN LAKE WETLAND
(PROVINCIALLY SIGNIFICANT)
SANG'S
CREEK
FEN
(PROVINCIALLY
SIGNIFICANT
WETLAND)
Arran Lake North
Life Sciences ANSI
(Regionally significant)
Grey-Sauble
Conservation
Authority
Saugeen River
East of Southampton
ANSI
(Regionally significant)
Chantry Island
Federal Bird Sanctuary
Saugeen River
Recreation Access
Point 14
Arran Lake South
Life Sciences ANSI
(Regionally significant)
Saugeen River
Life Sciences ANSI
(Regionally significant)
ARKWRIGHT
DRUMLINS
(PROVINCIALLY
SIGNIFICANT
EARTH SCIENCES
ANSI)
Saugeen River Southeast
Of Port Elgin Life Sciences
ANSI
Saugeen Valley
Conservation Authority
Saugeen Bluffs C.A.



The project area will create a barrier around the lake, fragmenting habitat and blocking migratory flyways


Seasonal migratory flight path
Diurnal migratory flight path from Chantry Island
Migratory Staging areas
Migratory staging areas
Seasonal migratory flight path
Migratory staging areas
Saugeen Village
HIGHWAY 21
South Bruce Peninsula
TURNER ST
RED ST
HIGH ST
HURON ST
SPENCE ST
PEEL ST
BAY ST
SOUTH ST
SIDEROAD 5 NORTH
SIDEROAD 15 ARRAN
SIDEROAD 20 ARRAN
CONCESSION 10 EAST ARRAN
CONCESSION 8 EAST ARRAN
Arran-Elderslie
CONCESSION 10
HIGHWAY 21
LINK S SIDEROAD
DOLL SIDEROAD
CONCESSION 6 WEST ARRAN
Arkwright
SIDEROAD 10 SOUTH ARRAN
JOSEPH ST
ELGIN ST
Saugeen Shores
Port Elgin
BRUCEROAD 17
BLIND LINE
B LINE
CONCESSION 4 ARRAN
17
© County of Bruce, 2008
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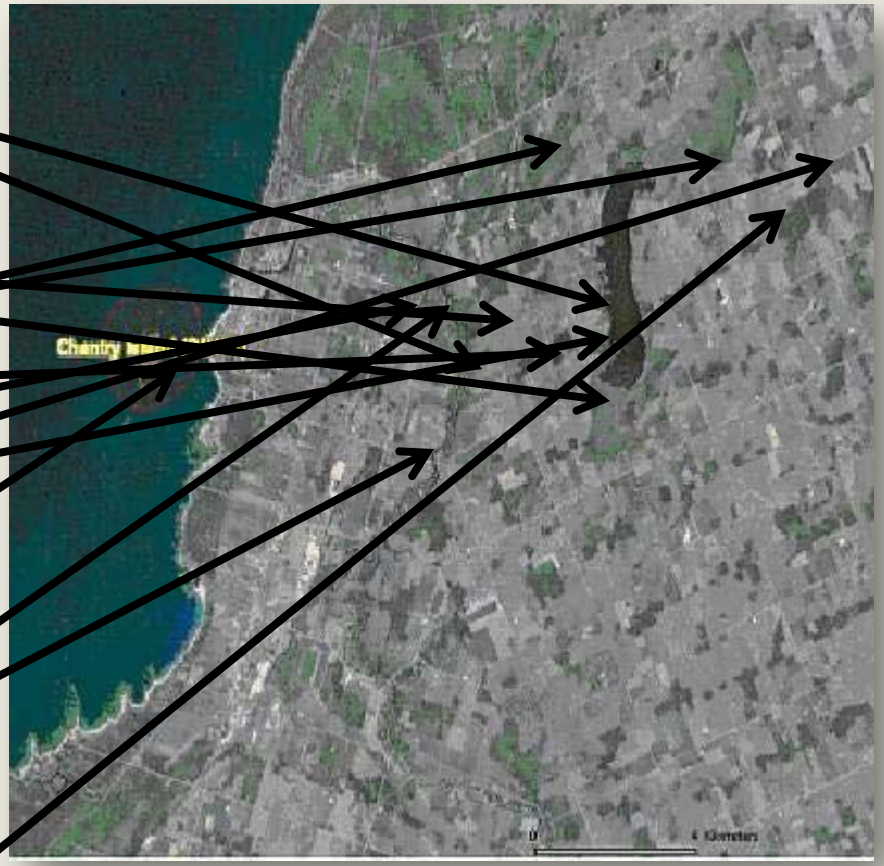
1660m

Among the 24 threatened, endangered, or species
of special concern around Arran Lake at risk from wind turbines are:

The Bald Eagle
The Red-headed Woodpecker
The Short-eared Owl
several kinds of rare snakes and turtles
and even the Grey fox

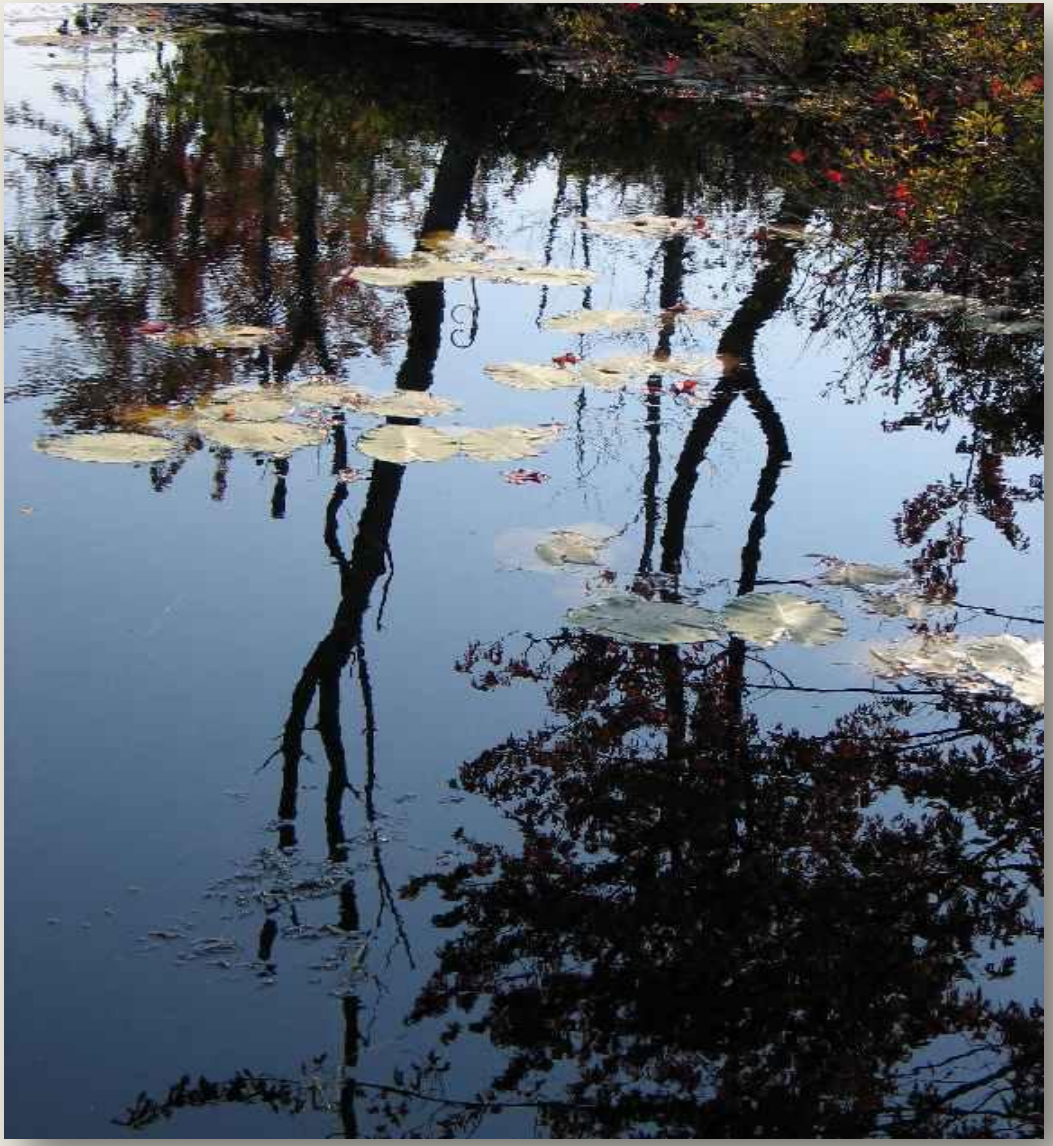
The lake and surrounding farmland form a Natural Heritage System (MNR) within site boundaries

- Significant FISH HABITAT
- Significant portions of habitat of ENDANGERED AND THREATENED SPECIES
- Provincially SIGNIFICANT WETLANDS
- Significant WILDLIFE HABITAT
- Significant WOODLANDS
- Rare WOODED DRUMLIN
- MIGRATORY BIRD SANCTUARY and nationally significant IBA (Important Bird Area) connected to Arran Lake by daily migratory corridor for foraging
- Significant VALLEY LANDS
- Arran Drumlins PROVINCIALLY SIGNIFICANT EARTH SCIENCES ANSI (Area of Natural and Scientific Interest)



The proposed site contains :

Colonial bird nesting sites
Waterfowl nesting
Shorebird migratory stopover areas
Landbird migratory stopover areas
Reptile hibernacula
Bat hibernacula
Bullfrog concentration areas
Migratory butterfly stopover areas
Rare vegetation communities
Amphibian woodland breeding ponds
Turtle nesting habitat
Snake hibernacula
Specialised raptor nesting and hunting habitat
Animal movement corridors
Areas of high diversity




Sensitive wetland creatures depend on the surrounding uplands for foraging and part of their life cycle.
Upland woodlands and creeks provide wildlife corridors vital for survival.

How wind turbines affect sensitive habitats

- Biologists are most concerned about habitat disruption and disturbance, leading to long term irreversible abandonment

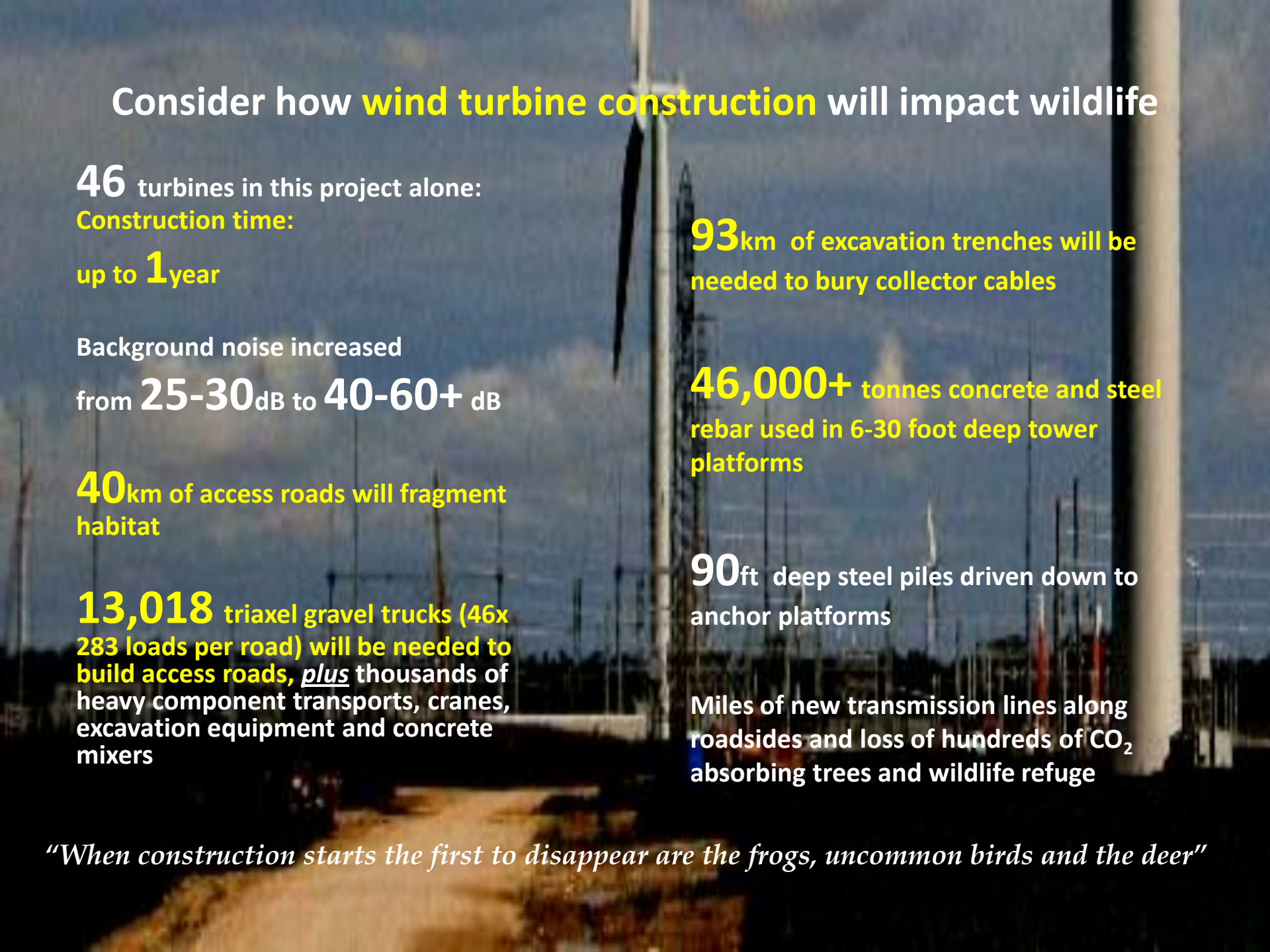
- Access roads, towers, rotating blades and new power lines fragment habitats and create barriers leading to collision mortality for birds and bats (especially songbirds, waterfowl and raptors)

- Disruptive noise and vibration, particularly prolonged intermittent and low frequency, lead to reproductive difficulties and species decline

- This will inevitably result in loss of biodiversity

Collision mortality with turbines and transmission lines is increased during adverse weather conditions.

Earth vibrations from wind turbines have been measured up to ten miles away.



Consider how wind turbine construction will impact wildlife

46 turbines in this project alone:
Construction time:

up to **1**year

Background noise increased

from **25-30**dB to **40-60+** dB

40km of access roads will fragment habitat

13,018 triaxel gravel trucks (46x 283 loads per road) will be needed to build access roads, ***plus*** thousands of heavy component transports, cranes, excavation equipment and concrete mixers

93km of excavation trenches will be needed to bury collector cables

46,000+ tonnes concrete and steel rebar used in 6-30 foot deep tower platforms

90ft deep steel piles driven down to anchor platforms

Miles of new transmission lines along roadsides and loss of hundreds of CO_2 absorbing trees and wildlife refuge

"When construction starts the first to disappear are the frogs, uncommon birds and the deer"

Do wind turbines kill more birds and bats than cats, cars, and office towers-- as promoters claim?

. . . as if a greater wrong excuses the lesser.

Even using the scant data inconsistently compiled by consultants hired by the wind power developers, **it is clear that industrial wind turbines kill many more birds and bats per unit than these other causes, particularly raptors (such as eagles and hawks) and migrating bats and songbirds.**

Consider the appalling results for monitoring on **Wolfe Island** a project the MOE approved-- despite numerous warnings:

- The 86-turbine wind farm on Wolfe Island caused **more than a 1800 bird and bat deaths in six months**. (This means 3600 in a year).
- **Seven** of the species have been identified as **species of conservation priority** by Ontario Partners in Flight (2006):

- 2 American Kestrels, 1 Northern Flicker, 1 Black-billed Cuckoo, 2 Eastern Kingbirds , 1 Bank Swallow, 1 Savannah Sparrow , 8 Bobolinks, 28 Tree Swallows , 1 Bank Swallow , 2 Barn Swallows 7 Purple Martins
- Along with 12 raptors, 3 red tailed hawks and one Merlin.

The Windsor Star recently reported the **slaughter of a Bald Eagle at a wind turbine site near Tillsonberg.** Eagles are a protected species.

Proponents claim the threats to birds and bats can be justified because "turbines are actually saving even more birds by cleaning the air and reversing global warming". But this is not true.

Wind power is intermittent, unpredictable, *does not replace other sources of electricity and has negligible CO_2 savings*.

CO_2 emissions saved by wind turbines : close to 0

"Wind power. . . can not make a significant contribution to reducing greenhouse gas emissions".
Peter Lang, energy production engineer, 2009

"Wind turbines . . . have produced no environmental benefit in Germany in terms of lowering of CO_2 emissions".
Rhein-Westfalia (Germany) Institute for Economic Research study, 2009

"As the level of wind capacity increases, the CO_2 emissions actually increase as a direct result of having to cope with the variation of wind-power output".
Irish Electricity Supply Board (ESB) National Grid Study, 2004

"Despite huge investments, wind-generated electricity 'has had minimal, if any, impact on carbon dioxide' emissions" in Colorado and Texas.
Robert Bryce , energy researcher, *Wall Street Journal* August 24, 2010

"Thermal power plants in the compensation of fluctuating production of windmills eliminate the major part of the expected positive effect of wind energy. . ."
Tallinn Technical University, Estonia study 2003

Inadequate Ontario government regulations:

Wind turbine developments may be placed 120 metres from wetlands—***but–*** *even closer if proponent provides a study claiming mitigation measures!*

What is the biological justification for the 120 metre setback when we know humans are affected even at 1 kilometre?

Quiet road beside Arran Lake

Recommendations of international biologists	
Study by the **Belgian Research Institute** for Nature and Forest, 2007	**Avoid** locating wind farms in regional or internationally **important bird or bat areas** and/or **migration routes**
Dr. Mark Avery, **Royal Society for the Protection of Birds, U.K.**	Developers should **avoid sites that are important to wildlife**
Danish biologists	•**1 km setback from staging areas** •Wind turbines **must not be placed** on flight corridors **between staging and field feeding area** •Turbines **must not be placed on migratory corridors** •Turbines **must not be placed in agricultural fields** traditionally **used by** large flocks of **foraging waterfowl**.
Dr Scott Petrie, **Bird Studies Canada**	**2km setback from staging areas** (based on our satellite tracking data of field feeding swans) to ensure that there are sufficient field feeding opportunities between the staging/loafing areas and the IWT development.

U.S. Fish and Wildlife Service *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* 2003	**1.) Avoid placing turbines in documented locations of any species of wildlife, fish, or plant protected under the Federal Endangered Species Act.** **2). Avoid locating turbines in known local bird migration pathways** or in areas **where birds are highly concentrated**. . . . Examples of high concentration areas for birds are **wetlands**, State or Federal refuges [sanctuaries], and **staging areas**. . . . **Avoid known daily movement flyways** (e.g., between roosting and feeding areas). **3.) Avoid placing turbines near known bat hibernation**, breeding, and maternity/nursery colonies, in migration corridors, or in **flight paths** between colonies and feeding areas.”
	The proposed Arran Wind Energy project is in defiance of all these international guidelines.

Authoritative Biological research and guidelines warning against adverse effects of wind turbines.

Biologists are most concerned about habitat disruption and disturbance, leading to long term irreversible abandonment
Access roads, towers, rotating blades and new power lines fragment habitats and create barriers leading to collision mortality for birds and bats (especially songbirds, waterfowl and raptors)
Disruptive noise and vibration, particularly prolonged intermittent and low frequency, lead to reproductive difficulties and species decline
This will inevitably result in loss of biodiversity

HABITAT ABANDONMENT / REDUCTION OF ABUNDANCE

Abandonment of habitat is a finding of one of the most recent research projects at the Centre for Evidence Based Conservation, School of Biosciences, University of Birmingham in the United Kingdom. In their SYSTEMATIC REVIEW NO. 4: Effects of wind turbines on bird abundance Review Report, Stewart, Pullin, & Coles (2006) concluded:

Species	Adverse effect	References
1. The Bald Eagle (*Haliaeetus leucocephalus)* Regulated under the *Fish and Wildlife Conservation Act* and also Ontario's *Endangered Species Act (E.S.A.)* in southern Ontario.	It is probable that any wind turbines sited in the Arran Lake vicinity would have a long term irreversible detrimental effect upon this protected species. This species is of paramount importance to the local First Nations community. The original family of the Saugeen Territory is the Eagle clan.	"Wind farms can affect local populations of Eagles . . . whose breeding . . . rates are naturally slow and whose populations tend to have smaller numbers of breeding adults" (Davis 1995) Manville and many other researchers specifically mention their apprehension over the safety of raptors nesting and hunting in close proximity to wind energy facilities. The Windsor Star recently reported the slaughter of a Bald Eagle at a wind turbine site near Tillsonberg.

2. Least Bittern *(Ixobrychus exilis)*

SARA and COSEWIC "threatened" species

•**This is a National Species of Special Concern.**

•**Level one priority species for conservation in Bruce County.**

•**Very small and declining population.**

•Natural Heritage Information Centre rates the Least Bittern as S3 (rare or uncommon).

"The clear perception among field observers is that the Least Bittern population in Canada is still declining. There has been an obvious loss of numbers in some Great Lakes marshes."

--Sandilands, A.P. and C.A. Campbell. 1988. Status Report on the Least Bittern, *Ixobrychus exilis. COSEWIC. 40 pp. Austen, M.J., M.D. Cadman and R.D. James. 1994. Ontario Birds at Risk: Status and Conservation Needs. Federation of Ontario Naturalists and Long Point Bird Observatory, Ontario. 165 pp.*

It would be impossible to demonstrate that wind turbine development would not effect the ecological function of the wetlands or the surrounding natural heritage system.

•**Depends on high quality marsh habitats that are being lost and *degraded* across the species' range**.

"Destruction of wetland habitat is the greatest single threat to Least Bitterns (Gibbs *et al. 1992).*

More than 90% of the original marshes in south-western Ontario are now gone (Snell 1978).

"Because Least Bitterns tend to fly very low, collisions with cars, fences, and transmission lines are a threat to mortality. (Gibbs *et al. 1992).*

"If development is allowed through or too close to wetlands, the habitat is obviously degraded for the bitterns.

The Arran Lake Wetlands provide its preferred habitat:

"Least Bitterns nest in freshwater marshes, with dense tall aquatic vegetation, interspersed with clumps of woody vegetation and open water. They are most regular in marshes that exceed 5 ha in area. Smaller marshes may be used on occasion, but do not sustain populations. In the northern part of their range they are most strongly associated with cattails (*Typha), which is the most common tall emergent (Gibbs et al. 1992), but they may also nest in bulrush (Scirpus), reed grass (Phragmites), horse tail (Equisetum), sedges (Carex), grasses (Graminaceae), Willows (Salix), and dogwood (Cornus) (Peck and James 1983)". The Arran Lake Wetlands provide all of these plants in abundance.*

3. Red Shouldered Hawk *(Buteo lineatus)*

The Red-shouldered Hawk is a specially protected raptor under the Fish and Wildlife Conservation Act.

"This species is protected by provincial game and fish legislation.

It was **classified as Special Concern by COSEWIC in 1996**.

In Ontario, Red-shouldered Hawks are **classified as Special Concern by the Ontario Ministry of Natural Resources**.

Active nests are also afforded **protection under the Fish and Wildlife Conservation Act (1997**),

and the species is a **Specially Protected Raptor under the Fish and Wildlife Conservation Act**."--http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=58#habitat

This is one of the raptor species that is **particularly vulnerable from wind turbine developments.** Its hunting territory around Arran Lake corresponds to the elevated drumlin ridges-- the precise sites of the proposed wind turbines. **Construction** of a wind turbine development (**including excavation for cables, tower pads and building of access roads**) has a **devastating effect on upland amphibian and reptile habitat essential for successful reproduction of this species.**

The breeding habitat of the Red-shouldered Hawk includes "**bottomland hardwood**, riparian areas, **flooded deciduous swamps** and **upland mixed deciduous/coniferous forest**. **Nearby wetlands or other aquatic areas are essential".**

"This species is area sensitive, preferring extensive forest stands consisting of mature to old-growth canopy trees with variable amounts of under story. Large, contiguous forest tracts are essential to sustain breeding populations of this species". --COSEWIC 2006. COSEWIC assessment and update status report on the Red-shouldered Hawk *Buteo lineatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa.*
vi + 27 pp.
http://www.sararegistry.gc.ca/status/status_e.cfm

"The Red-shouldered Hawk . . . is an area sensitive species that requires mature forest habitat (McLaren *et al. 1998).*

"**The most serious threats facing Red-shouldered Hawks** in the southern portion of their Canadian range (i.e. south of the Canadian Shield) **include habitat loss, and fragmentation or degradation of favoured deciduous forest breeding areas and wetland feeding areas** (Helferty *et al. 2002).*
"Loss of wetland habitats also negatively affects this species through the **disappearance of preferred prey (i.e. amphibians, snakes).** Campbell (1975) suggested that **Red-shouldered Hawk pairs with lower access to reptile or amphibians might have lower reproductive success".**
"Loss and **fragmentation of habitat also have indirect effects, including reduction in prey supply and increased interspecific competition".**68
"**Many Red-shouldered Hawks will avoid areas of human use (Helferty *et al. 2002). For example, human disturbance (from ATVs, . . . etc.) has pushed this species into the more remote wilderness areas".***

This site is therefore of "very high sensitivity" and not suitable for wind turbine development.

4. King Rail *(Rallus elegans)*

•The King Rail is protected under the **federal *Species at Risk Act (SARA)***

•Listed by the **MNR/ROM** as **endangered provincially and nationally**.

•Its very small **population** in Canada **shows continued decline**.

•*In view of the sensitivity of this species to habitat disturbance and the intimate relationship between the wetland and the ecological function of the surrounding uplands, it would be impossible to prove that the siting of wind turbines within this natural heritage system would not cause disturbance to the wetland and degrade its quality sufficiently that it could no longer support this endangered species. The presence of this bird makes the area one of very high sensitivity and it should be avoided by wind turbine developments.*

Few patches of remaining habitat are large enough and of sufficient quality to support this species. "**Loss of wetland habitat" and disturbance "has been the greatest single factor in the decline of the King Rail in Ontario, and is the greatest threat to their continued existence."**

Most of the wetlands suitable for King Rails have been eliminated. The quality of the remaining habitat is also deteriorating.--MNR Natural Heritage Information Centre Data on rare species in Ontario: http://nhic.mnr.gov.on.ca/MNR/nhic/species/listout.cfm?el=ab&sort=elcode

Scattered breeding season reports come from a number of other places in southern Ontario as far north as the Bruce Peninsula. "King Rails can occupy a variety of freshwater marshes and successional marsh shrub swamp habitats (Meanly 1992). In wetter areas wild rice seems to be important (Cosens 1985). What is probably most important are large marshes with more open shallow water areas merging with shrubby areas (McCracken and Sutherland 1987). Minimum size requirements are unknown (Brown and Dinsmore 1986), but, **only where there are large expanses of marsh, not overgrown with cattails, do birds return in successive years, and persist over time in Ontario**". Arran Lake provides one of the best of the only remaining 10% of the original pre-European settlement marshes left in southwestern Ontario. **The presence of wild rice and open shallow water that merges with shrubby areas as well as the large extent of the wetland complex make it one of the few habitats suitable for this declining species.**

5. Black Tern *(Chlidonias niger)*

•Listed by the MNR as a species of **special concern** with the general Ontario Status as **"sensitive".**

• The **presence of the Black Tern was noted on the 1985 Field Evaluation of the Arran Lake Wetland by the Grey Sauble Conservation Authority** as one of the nesting colonial waterbirds found at the lake.

•The Black Tern and its nest are **protected under the Migratory Birds Convention Act.**

•**It is already considered endangered in New York, Pennsylvania and Ohio**, threatened in Ontario, and a species of special concern in Michigan''.

.

Terns and Gulls are susceptible to wind turbine mortality. (Stewart, Pullin, & Coles). The presence of wind turbines intercepting its migratory landing at the lake would be an additional threat to this species of special concern, especially during adverse weather conditions during the migratory season.

The relatively large size of the Arran Lake wetland complex makes it attractive to the Black Tern. According to the MNR data, "it generally requires permanent marshes that are at least 50 ha. Black Terns have disappeared from many marshes that have been reduced much below this threshold. "

"The **decline might be more directly connected to habitat loss due to development pressures**. The future of the Black Tern is quite uncertain. 73

Several species of marsh birds are 'area sensitive,' requiring large tracts of habitat in order to successfully reproduce. **The Black Tern is moderately area-sensitive.**"

"Recent declines have been occurring since the 1980's. **The Black Tern has seriously declined throughout its range**. A recent analysis of Breeding Bird Survey data showed that the population has been declining by an average rate of 4.7% per year since 1966. **Over the span of just 30 years, this translates to an overall loss of about 75% of the population!** This species is clearly in serious trouble.

6. Great Egret *(Ardea alba)*

This is one of the birds known to **use the daily movement flyway between breeding and roosting areas at the Federal Bird Sanctuary IBA on Chantry Island and feeding areas around the Arran Lake wetlands and the Saugeen River valley lands.**

The Chantry Island colony represents a significant part of the Canadian population of this species. The presence of a significant percentage of the national population of this species and the fact that it frequently flies directly over the proposed wind turbine site make this a "very sensitive area".

In addition this large bird is slow to climb on take-off and slow in flight, making it more vulnerable to collision mortality from the turbine blades, especially during adverse weather conditions. It is therefore reasonable to expect that if wind turbines were placed along the daily migratory pathway of this species, some mortality of a significant part of the national population would occur.

[70] Bird Studies Canada; IBA site listing for Chantry Island On 154. http://www.bsc-eoc.org/iba/site.jsp?siteID=ON154

The Chantry Island inventory states: "In 1991, surveys revealed six nests of Great Egret, which represents approximately 3% of the Canadian population".**70** However, by 2007, the number of Great Egret nests on the island had increased to 54, a considerable increase in national population percentage. --Cindy Cartwright, *Chantry Island Bird Survey,* June 8 2004. http://www.chantryisland.com/birds_of_chantry_island.htm

7. Black-crowned Night Heron (*Nycticorax nycticorax)*

•Listed by **COSEWIC** as a **"sensitive" species**
•**OBAR** (Ontario Birds at Risk) as a **target species of rare breeding birds in Ontario**. http://www.bsc-eoc.org/obar.html

• The **1985 MNR wetland data record** confirms that the **Arran Lake wetlands are a "feeding habitat for this Provincially Significant Animal Species"**. This links it to the protected Federal Bird Sanctuary on Chantry Island. Toth, G, Morton, J, & Hill, A. *Wetland Data Record: Arran Lake. Ministry of Natural Resources South Western Administrative Region and District Owen Sound:* 8 August, 1985.

The records of Bird Studies Canada indicate that the field surveys of Chantry Island in 1991 found 100 nests of Black-crowned Night-Herons. "This is at least 2% of the national population. In 1989 and 1990, nationally significant numbers of this species were also found, with 56 and 97 nests, respectively."--http://www.bsc-eoc.org/iba/site.jsp?siteID=ON154

The presence of nationally significant numbers of this species and its documented use of the flyway between the Island and Arran Lake is another reason the **Arran Wetlands Natural Habitat System must be regarded as an area of "very high sensitivity**".

The construction of a wind turbine development along this flyway would endanger a significant number of the population of this species.

"As its name implies, this stocky, short-legged heron is active at night. About sunset and in the gathering dusk it makes its steady way on broad wings to its feeding marshes. It feeds largely on fishes, but **also eats frogs and small rodents".**

The Arran wetland and surrounding uplands are one of its most important feeding resources.

Disturbance of the upland meadows and pastures by excavation for 93 kilometres of collector cables, 46 turbine pads and 43 kilometres of access roads would have a devastating effect on the habitat of the amphibian and rodent population, eliminating a an important part of the food source of this species.

8. Caspian Tern (*Hydroprogne caspia, formerly Sterna caspia)*

The presence of this species is listed in the Ontario Ministry of Natural Resources *Wetland Data Record: Arran Lake.40*

•*In Canada,* ***breeding colonies are few, and the total numbers of birds relatively low.***

•***Designated as rare by COSEWIC (1997)*** *and considered to be a vulnerable species in Ontario.*

•*Target species by the Rare Breeding Birds of Ontario.41*

•*The presence of a rare tern at Arran Lake makes this an area of very high sensitivity.*

•*The recent research project at the Centre for Evidence Based Conservation, University of Birmingham referred to above, found that wind turbines reduce the abundance of many bird species at a wind farm site, and that "Gulls and Terns (along with Ducks) experience greater declines in abundance than other bird groups suggesting that a precautionary approach should be adopted to wind farm developments near aggregations of Anseriformes (Ducks) and to a lesser extent* Charadriformes (Gulls and Terns)". - -Stewart, Pullin, & Coles. *SYSTEMATIC REVIEW NO. 4: Effects of wind turbines on bird abundance Review Report, (2006).*

In the same report, there is also evidence that the impact of wind farms on bird abundance becomes more pronounced with time. This, of course, is a major issue for a rare bird such as the Caspian Tern, whose numbers are already in decline.

9. Short-eared Owl (*Asio flammeus)*

•Listed by **COSEWIC** (April 2008) and by **SARA** as a **species of Special Concern.**

•It is on the **MNR Bruce county priorities for conservation list of species that are sensitive to disturbance or that are declining.**

A functioning, unfragmented natural wildlife system is crucial to to its survival. Like the other raptors found within the proposed wind turbine development site, the Short-eared Owl would be especially endangered by the presence of rotor blades on the drumlin ridges used for hunting. The presence of the turbines and associated disturbance amid these hunting pastures and hay fields would inevitably lead to a decline in the abundance of its prey and eventual abandonment of this traditional habitat by the Short-eared Owl.

This bird prefers "extensive stretches of relatively open habitat. It is primarily a bird of marshland and deep grass fields. It likes to hunt and roost in abandoned pastures, fields, hay meadows, grain stubble, and marshes in the winter. Nests are usually slight depressions in the ground. In Ontario, some nests are cups of dried weeds or flattened grasses."--
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=60

10. Red Headed Woodpecker *(Melanerpes erythrocephalus)*

"This species has experienced a **significant decline over the long-term associated with habitat loss** and the removal of dead trees in which it nests. There is no evidence to suggest that the population trend will be reversed."-- COSEWIC Assessment and Update Status Report on the Red-headed Woodpecker *Melanerpes erthrocephalus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, 2007. (www.sararegistry.gc/status/status_e.cfm).*

•The **COSEWIC** Assessment and Update Status Report of 2007 lists it as **"threatened".**

•It is **protected under the *Migratory Birds Convention Act, 1994.***

•*In **1996 it was designated by COSEWIC as a species of Special Concern.***

•*(The **SARA Registry indicates that it is still declining)*** - http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_melanerpes_erythrocephalus_e.pdf (Technical Summary)

•***NatureServe** ranks the species as **vulnerable in Ontario.***

•*In Ontario, the **Ministry of Natural Resources** has designated it a **species of special concern** and it appears on the **provincial species at risk list.***

It is known to nest in old growth forests of the Arran Lake Wetlands Natural Heritage System, including the Krug woodlot immediately adjacent to the proposed wind turbine site.

SPECIES IN RECOVERY PROGRAM:
11. Loggerhead Shrike (*Lanius ludovicianus migrans)*

There is also the likelihood of use of this habitat by the Loggerhead Shrike **(COSEWIC, SARA endangered provincially and nationally).**

•It is now a species in a recovery program.

•The birds and their eggs are **protected by the federal *Migratory Birds Convention Act, 1994.***

•*Rare and Endangered Species of Grey and Bruce County, published by the Owen Sound Field Naturalists, indicates **this part of Arran Township as one of the few traditional nesting habitats for this bird.** Loggerhead shrike nested successfully within the proposed site in 2002. They are also historically documented nesting in the Dunblane area, also within the proposed site.*

*The **Arran Lake uplands**, part of the Shrike's traditional territory, **still provide a perfect habitat for this bird because of the short grass pasture land, presence of mature hawthorn trees used for nesting, and abundance of split rail fences and dead trees used as perches when hunting.** The proposed development would certainly be at odds with this important rescue program for such a shy bird near extinction.*

Elaine Williams, Executive Director, Wildlife Preservation Canada, contact person for the Eastern Loggerhead Shrike Recovery Strategy wrote in an E-mail: "The last known nesting pair in that area was in 2002. However, last year, we had one of our 2006 release birds return to the Dyer's Bay area, and later that season a reliable birder spotted three shrikes, one was definitely an adult and the other a juvenile (he couldn't see the other one properly), so there was nesting last year on the Bruce." **The Arran Lake area "is shrike nesting habitat** (as long as it has the right mix of habitat features that shrikes require, i.e. short grass or active pasture land, has some snags or hydro poles from which the shrikes can perch and hunt and has hawthorns or thorny apples of the right size for a nesting tree and impaling site), and **it should be preserved for the recovery program".**

12. Bobolink (*Dolichonyx oryzivorus)*

The **Ontario Breeding Bird Atlas** indicates **that Bobolinks have suffered a 28% loss of area occupancy over the last 20 years**. The cause is thought to be **declining quality and quantity of wet meadow habitats**. As a result, the Bobolink has been placed on the **COSEWIC candidate species list "Group 1"—of the highest priority** for assessment because it is **"suspected to be at high risk of extirpation from Canada".** --[--] http://www.cosewic.gc.ca/eng/sct3/sct3_1_e.cfm#p2

In spring, the upland fields around Arran Lake are abundant with this species notable for their aerial flight displays.

There were 8 Bobolinks listed among the first six month fatalities at the Wolfe Island wind development.

It is inevitable that the construction and operation of wind turbines would provide sufficient disturbance and quality loss to wet meadow habitats of this bird that would further contribute to the serious population decline it has already suffered: 84% of its population over the last 37 years and an even more accelerated population decline of 53% in only the last 10 years.

Song birds are especially susceptible to collision mortality with wind turbine blades and transmission lines during migration and poor weather conditions.

Two other similar COSEWIC "candidate species" list birds found at Arran Lake are:

13. Barn Swallow (*Hirundo rustica) of concern across Canada.*

14. Field Sparrow (*Spizella pusilla), of concern in Ontario.*

REPTILES AT RISK AT ARRAN LAKE:

15. Spotted Turtle (*Clemmys guttata)*

In Canada, the Spotted Turtle was designated vulnerable, a Species of Special Concern) by COSEWIC in 1991. The Ontario Ministry of Natural Resources lists the species as Vulnerable (1996), and the Ontario General Status is Sensitive (1999). The Spotted Turtle is listed as a Specially Protected Reptile in Ontario. 47 Because of the habitat range of this vulnerable species and its presence during part of its annual cycle on land proposed for wind turbine construction, it is easily foreseeable that habitat fragmentation and disturbance, the building of roads to the turbine sites, increase of truck traffic during and after construction, and elimination of some of the traditional nesting environment would have an adverse effect upon this protected species. Any mortality would be all the more serious because of the low rates of reproduction of this reptile.

[71] Cindy Cartwright, *Chantry Island Bird Survey, June 8 2004.* *http://www.chantryisland.com/birds_of_chantry_island.htm*

[72] Ibid.

[73] Ibid.

[74] http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=60

The Arran Lake Wetlands are an ideal habitat for the Spotted Turtle which occurs in high organic content wetlands including acidic bogs and alkaline fens in the Eastern Deciduous/Great Lakes forest region. The species prefers unpolluted shallow waters of ponds, bogs, fens, marshes, ditches, vernal pools, woodland streams, sedge meadows and the sheltered edges of shallow bays (Ernst et al. 1994; Haxton and Berrill 1999; Litzgus and Brooks 2000).

It also represents one of those species that moves from the wetlands area to the surrounding uplands during part of its seasonal cycle.

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“Spotted Turtles use a mosaic of habitat types, display distinct seasonal shifts in habitat use (Haxton and Berrill 1999; Litzgus and Brooks 2000), and require

16. Northern Map Turtle *(Graptemys geographica)*

COSEWIC Special Concern 2002

COSEWIC 2002. COSEWIC assessment and status report on the northern map turtle Graptemys geographica in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp. Roche, B. 2002. COSEWIC status report on the northern map turtle Graptemys geographica inCanada, in COSEWIC assessment and status report on the northern map turtle Graptemys geographica in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-34 pp.

The Northern Map Turtle is protected in Ontario by the 1997 Fish and Wildlife Conservation Act.

This turtle occurs within the Saugeen River Valley or is associated closely with the valley system further upstream, between the communities of Southampton and Port Elgin.

Females may wander considerable distances inland in search of well-drained, sunlit sites (Johnson, 1982), or sites with soft-ploughed soil or clear dry sand (Carr, 1952). The absence of vegetation and shade permit maximum solar radiation to heat the substrate and to incubate the eggs (Vogt and Bull, 1984).

Development of any type along shorelines and riverbanks may destroy important habitat, because turtles nest and bask along sandy areas close to water. Females would be forced to travel farther to find suitable nesting sites, putting them at risk from vehicles and even raccoons, which increase in numbers near urban areas (Anon, 1996).

Even in relatively protected and undeveloped areas such as Lake Opinicon in the Queen's University Biological Station area, cottage development on shorelines, especially on islands, destroys nesting areas, and **increased traffic leads to more road kills of nesting females** (G. Blouin-Demers, S. Holt, M. Gross; pers. comm., 2002).

COSEWIC Assessment and Status Report on the Northern Map Turtle *Graptemys geographica* in Canada http://dsp-psd.pwgsc.gc.ca/Collection/CW69-14-350-2004E.pdf

17. Wood Turtle (*Glyptemys insculpta*)

was known as "old redleg" owing to the orange or brick-red colour of it legs.
Status: **Endangered Provincially**

•Protected under Ontario's *Fish and Wildlife Conservation Act*.

•**A recovery plan**, sponsored by the Ontario Ministry of Natural Resources, **is in preparation**. Parts of the recovery plan which call for surveys are already being implemented.

•The species is **protected in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** which controls international trade in listed species.

Ontario Ministry of Natural Resources Species at Risk Website.
Text Sources: Lizgus and Brooks 1996
Last Modified Date: July 2010

The Wood Turtle's aquatic habitat consists of clear rivers, streams or creeks with a moderate current and sandy or gravelly bottom. It spends proportionately more time on the banks of watercourses and in a variety of terrestrial or intermediate habitats than other native Ontario turtles. Although it uses wooded areas, it **prefers more open habitats such as wet meadows, swamps and fields.** Wood Turtles over winter on stream bottoms.

A resident within the project area, Gary Hartwell recently reported observing a full grown female Ontario Wood Turtle on two different summers at the creek that cuts through both south corners of his property. He was concerned that there may be tinier offspring and that they will not be protected from habitat degradation by the wind turbine project, specially since the project maps did not show all the creeks in the area.

Turtles are particularly susceptible to the degrading effects of wind turbine construction owing to the fact that they spend part of their life cycle on upland meadows in the areas which would be fragmented by connector cable excavation and access road building. The huge inundation of heavy construction vehicles would be an additional threat to their survival.

18. Eastern Milk Snake *(Lampropeltis tirangulum)*

•**COSEWIC Special Concern**. There is increased concern over this species in Canada resulting in a designation of Special Concern nationally by COSEWIC in May 2002.

•**Protected** under the **federal *Species at Risk Act (SARA).***

•Listed as a **"specially protected species" in schedules of the Fish and Wildlife Conservation Act, 1997**.

•It is listed by the **Royal Ontario Museum** as a **species of special concern provincially and nationally.**

--COSEWIC 2002. COSEWIC assessment and status report on the milksnake *Lampropeltis triangulum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 29 pp. Fischer, L. 2002. COSEWIC status report on the milksnake Lampropeltis triangulum in Canada in COSEWIC assessment and status report on the milksnake Lampropeltis triangulum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-29 pp.*

This species **has been observed annually in the vicinity of the proposed wind turbine site at Arran Lake**. Its preferred habitat includes farm fields, hayfields, pastures, swamp and open woodlot. Two other important features make this area ideal Milksnake habitat: the proximity to water, in this case Arran Lake and the wetlands, and suitable locations for basking and egg-laying.

This species would threatened by habitat disturbance and fragmentation caused by cement trucks, cranes, the vehicles of work crews and heavy transport vehicles associated with wind turbine construction. Its traditional habitat would be disturbed by the construction of access roads and connector cable excavation.

Low frequency noise emitted by operating wind turbines and the earth absorbed vibrations is an important issue with this species. These would **result in habitat disturbance since snakes are extremely aware of vibrations and use this means of sensing threats** rather than hearing. All of these disturbances would apply also to all snakes and reptiles found in the area—the more common ones being a source of prey for the waterfowl and other birds.

This species has been designated because of characteristics that make it particularly sensitive to human activities. (Lovich 1989; Burke et al. 2000). The snake is **susceptible to the effects of human encroachment as well as habitat loss.**

•**Many Milk snakes have been killed by vehicular traffic** ("road-kill") or by agricultural machinery. **Milksnakes are especially affected by habitat loss and modification.** Special significance of the species: **The Eastern Milksnake is the only subspecies of Milksnake found in Canada.** The snake's presence in barns and stables has proven to be beneficial, as the snake helps to control rodent populations (its prey).

--ROM Litzgus 2004; Oldham 1991; Cook 1984 http://www.rom.on.ca/ontario/risk.php?doc_type=fact&id=96)

19. Eastern Ribbon Snake (*Thamnophis sauritus)*	There is little historical data in Ontario on abundance trends, but it is likely that the reduction of wetland habitat through urban and agricultural development resulted in a decrease in abundance in Ontario. Today it is widespread and locally common in parts of the Bruce Peninsula, Georgian Bay and eastern Ontario.	**This species would suffer from habitat fragmentation within the wind turbine project area, from disturbance during the prolonged construction phase, from habitat degradation owing to barrier formation, increased vehicular traffic and excavations, as well as chronic long term low frequency vibration. It is not possible to mitigate the permanent damage done to this habitat and abandonment would likely result, with severe consequences for survival.**
•**COSEWIC designated** this snake of **Special Concern** for the Canadian Great Lakes population in May 2002. •**The Royal Ontario Museum/MNR** lists this species as **Special Concern provincially and nationally.** •This species is **included in the Greater Georgian Bay Reptile Awareness Program.** Habitat stewardship projects for it are ongoing in Ontario and Quebec under RENEW **(Recovery of Nationally Endangered Wildlife), the national recovery program** established **under the Accord for the Protection of Species at Risk.**	Its presence at Arran Lake is explained by the fact that it is usually found close to water, especially in marshes where it hunts for frogs and small fish. At the onset of cold weather, individuals congregate in burrows or rock crevices on land to hibernate together in what is termed a "hibernaculum.”	

MAMMALS AT RISK AROUND ARRAN LAKE: **20. Grey Fox *(Urocyon cinereoargenteus)*** •**COSEWIC: Threatened** (May 2002) **(MNR/ROM) Threatened nationally and provincially.**	The proposed wind turbine site is part of the traditional, preferred habitat of the Grey Fox, which has been seen on two recent occasions by local naturalists in this area. Its presence demonstrates the use by a single animal of both upland forest and marsh habitat within the Arran Wetlands natural heritage system: the grey fox prefers deciduous forests (where it climbs trees to escape enemies) and marshes; and it may also be found in agricultural areas. The local population is part of the south western Ontario population, the only known resident breeding population for grey fox in the province..	Habitat disturbance for this animal would result from the intrusive nature of wind turbine construction, operation and maintenance. The effect would be cumulative since the turbines would be located amid its hunting territory

PLANTS AT RISK AT ARRAN LAKE:

The Ministry of Natural Resources, Owen Sound Office, has indicated that at least three plant species considered by the Ministry of Natural Resources to be at risk and COSEWIC species of special concern are found at Arran Lake. These include:

21. Tuberous Indian-plantain *(Arnoglossum plantagineum)*

•"Status: **Special Concern**. Reason for designation: **limited occurrences present within five shoreline areas of Lake Huron**.

•**The Ontario population consists of just 5000 flowering plants.** It is probable that the known drying effect of the wind turbines would eliminate some of the wet meadows that are the habitat of this plant.
--COSEWIC 2002. COSEWIC assessment and update status report on the tuberous Indian-plantain Arnoglossum plantagineum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 11 pp. White, D.J. 2002. Update COSEWIC status report on the tuberous Indian-plantain Arnoglossum plantagineum in Canada, in COSEWIC assessment and update status report on the tuberous Indian-plantain Arnoglossum plantagineum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-11 pp. Previous Report: Keddy, C. 1988. COSEWIC status report on the Indian-plantain Cacalia plantaginea in Canada. Committee on the Status of Endangered Wildlife in Canada. 28 pp.

22. Longleaf Dropseed *(Sporobolus asper)*

23. Rigid Sedge *(Carex tetanica)*

This plant is very rare in native habitats.

The presence of all three rare plants further illustrates the unique quality and high sensitivity of the Arran Lake natural heritage system.

FISH

24. Lake Sturgeon *(Acipenser fulvescens)*

Special concern provincially

The Lake Sturgeon is Canada's largest freshwater fish species.

Cause of decline:
habitat degradation resulting from human activities

Internationally, the Lake Sturgeon is listed on Appendix II of the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES). In Canada, the Lake Sturgeon and its habitat are managed by each province under regulations of the federal Fisheries Act.

A report by Ivan Buxton has combined a variety of study findings and concludes "there is a case to answer when land based animals and **freshwater creatures are exposed to noise at low Hz levels**.

"Other creatures have lower acceptance levels, as their survival is more reliant upon instinct and interpretation of unusual sounds as a source of danger.
"There is reason to suppose that similar effects would also occur with wild animals if exposed to the sounds for long enough periods. The presumption must be that as soon as they felt uncomfortable they would move away from the zone of discomfort. A term more properly described as, disturbance and displacement, which in the case of protected species would be contrary to appropriate legislation.

"An independent report sponsored by Society for Conservation of Marine Mammals was produced in 2003. It concluded that both harbour porpoises and harbour seals reacted to the water bourn simulated sound of a 2 MW wind turbine".

"Laboratory studies upon animals have been reviewed with quite chilling results, as it clear that deformities, damage and impairment occur to the subjects with regularity. Admittedly the animals were contained and subjected to exposure times of several hours per day at moderate to high intensity levels of LFN and infrasound. Yet fish and aquatic creatures contained in ponds and lakes would certainly be unable to escape whatever the level of sound intensity or duration of exposure". --*Low Frequency Noise and Infrasound (Some possible causes and effects upon land-based animals and freshwater creatures): A literary comment*. Ivan Buxton. 2006.

Do our tourists want this?

Or this?

SUMMARY of presentations at the Tara Town Hall Meeting, 30 Sept, 2010:

1. Even at **a setback of only 550 metres, there are still far too many people complaining about adverse health effects**. There is a move in England leaning to 5 km setbacks from homes.

2. Many farmers continue to experience **serious health impacts on livestock** resulting from unresolved problems **with stray voltage**, often associated with wind turbine installations.

3. Many **people living near wind turbines are unable to sleep**, experience continuing stress and **increasing health problems**. Some have had to **abandon their homes**.

4. While **wind turbines are being sited unsafely**, exposing homes, traffic and our families to ice throw and blade fragmentation risks, **government noise regulations** already in place **are being violated** on a daily basis.

5. **Our hydro bills are skyrocketing because we are paying twice for wind produced electricity**: once with extravagant feed in tariff rates to benefit producers and a second time **to run polluting single-cycle gas plants to back up wind**.

6. **Real estate values *are* affected by wind turbine developments**. Industry generated "studies" fail to take into account that **houses** near wind turbines **remain unsold** and are often **withdrawn** from the market or **abandoned**.

7. **The environmental footprint of a wind turbine is not benign**. It does little to save CO_2 emissions, does not replace coal, but **it is destroying our natural habitats, endangered species and biodiversity.**

<u>Bottom line</u>:

Wind power is undispatchable, unreliable, inefficient and expensive.

Why are we allowing our provincial government to **destroy our health**, **deplete the value of our homes**, **jeopardize our safety**, **sell us unaffordable electricity**, **degrade our natural heritage** and **channel our taxes into welfare for multinational energy companies?**

Saugeen Valley lands