



# Assessing Impacts of Wind Turbines on Birds through the Canadian Environmental Impact Assessment process

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# Development of wind power

- Federal government in Canada is encouraging wind power as a clean source of renewable energy
- However, need to minimize adverse impacts on wildlife



# Migratory Birds



- Canadian Wildlife Service (CWS) of Environment Canada involved in conservation of Migratory Birds protected under international treaties (shared species with other countries) as well as species listed under the federal Species At Risk Act (SARA).



# Environmental Assessment in Canada

- *Canadian Environmental Assessment Act* (CEAA)
- Federal Environmental Assessment:
  - federal government is proponent
  - development on federal lands
  - federal funding incentives
  - federal permits (e.g. fisheries) involved



# Environmental Assessment in Ontario

- *CWS has reviewed ~120 wind proposals in ON, mostly under the provincial EA process*
- *Provincial EA applies to almost all wind power in ON, except*
  - *developments < 2MW*
  - *developments on federal lands, including First Nation reserves*
- *ON's EA trigger is known earlier (more certain) than federal trigger so CWS typically engages in the provincial EA first*
- *To date, the vast majority of wind power projects in ON have not required federal approval*



## Environmental Impact Process: some realities

- Provide expert advice (cannot ‘approve’ or ‘stop’ a project; that’s up to the responsible authority)
- If there are deep concerns, must demonstrate ‘significant negative population impacts’



# Environmental Impact Process

- *Proponent prepares Environmental Impact Statement*
- *Government decision-maker consults with stakeholders/agencies/experts and decides whether any significant adverse impacts cannot be mitigated*
- *Outcomes:*
  - *Approve (likely with conditions, e.g. monitoring)*
  - *Request more information (if major uncertainty)*
  - *Subject the project to a higher level of EA (sig. public concern)*
  - *Deny approval for project (if serious adverse impacts)*



# Other Species

- EA needs to consider all environmental impacts: other wildlife, and other issues (e.g. water)
- Coordinate among many agencies for various aspects



**To help guide process for birds:**



# Wind Turbines and Birds

## A Guidance Document for Environmental Assessment

Environment Canada / Environnement Canada  
Canadian Wildlife Service/Service canadien de la  
faune



Environment Canada  
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## Guidance document:

Used in conjunction with CWS experts  
to consider site-  
specific concerns

Identifies types of information  
and assessment required in  
a project-level EA



# First Step: Preliminary Assessment

Review existing information (guidance document provides advice on potential sources)

Determine potential risk factors

Must consider all aspects of project:  
turbines, roads, power lines



# Use to determine Site Sensitivity

- Very High
  - Species at Risk
  - Large breeding colonies
  - Major concentrations of birds
  - Important Bird Areas, Parks
- High
  - Geographic concentration area
  - Important habitats



# Site Sensitivity, continued

- Medium
  - regionally or locally significant habitats or bird numbers
- Low
  - none of the above



# Site Sensitivity, continued

- Special Consideration
  - offshore sites
  - (marine and Great Lakes)



# Standardized monitoring protocols

- To facilitate comparison of data among projects, and to provide clarity for proponents and agencies, CWS has prepared a companion document:

**“Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds”**



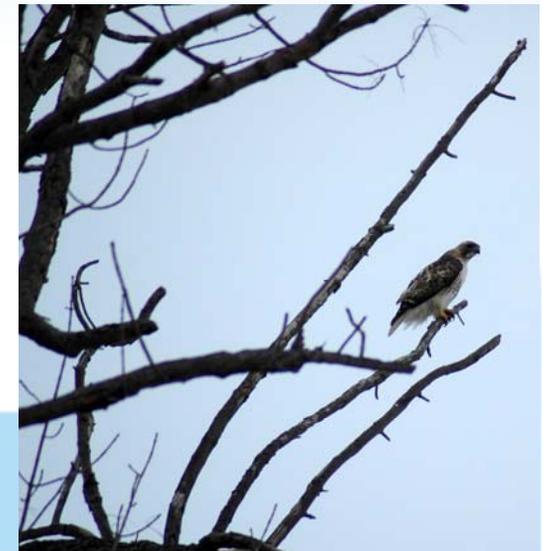
# Consultation with CWS

- *Guidelines and Protocols both available on web:*  
[http://www.cws-scf.ec.gc.ca/publications/eval/index\\_e.cfm](http://www.cws-scf.ec.gc.ca/publications/eval/index_e.cfm)
- *Intended for use in consultation with CWS biologists:*
  - *determine which protocols are appropriate for a particular site (based on preliminary information)*
  - *determine a reasonable level of effort (e.g., number of point counts to conduct)*



# Pre-construction monitoring

- Generally, require pre-construction monitoring over 1-year period
  - compromise between what might be desired for scientific rigour and what is reasonable to ask proponents, especially because most projects are not (currently) expected to have major impacts
- May require more in very high risk/high uncertainty areas (e.g., offshore, wintering raptors)



# Pre-construction monitoring

- Three objectives:
  - Estimate potential adverse impacts
  - Identify any possible mitigation measures
  - Provide baseline data for post-construction evaluation of actual impacts



# Potential pre-construction surveys:

- Breeding bird surveys
  - Area Search – species presence and relative abundance
  - Point Counts – more quantitative measures
  - Possible use of microphone recordings



# Potential pre-construction surveys:

Migration/Stopover/Wintering surveys:

look for major concentrations of birds

- species presence at time of year
- how birds are using area



Passage migration counts:

most likely required if

high concentrations anticipated

e.g. raptors



## Potential pre-construction surveys:

- RADAR
  - Not generally expected except as part of research projects or if particularly high uncertainty (e.g., offshore)
- Requirements may change as we learn more in the future – ongoing research by CWS



# Post-construction monitoring

- If facility is built, need to evaluate actual impacts



# Post-construction monitoring

- Bird usage of area – has this changed?
  - similar protocols to pre-construction to allow direct comparison
- Mortality studies – how many birds (or bats) are killed?
  - carcass searches



# Post-construction monitoring

- Amount determined during screening
  - 1 to 3 years (potentially more) depending on risk factors and anticipated impact
  - for small site with few birds in area one year may be sufficient
  - requirements may decrease in future as we learn
  - Process to store all data in a central data base so we can learn more



# Improving Decision Making

- Targeted Research Projects by CWS and partners to reduce specific uncertainties:
  - understanding migration patterns
  - raptor behaviour/mortality
  - offshore developments
  - mountain passes



# Adaptive Management

- Learn from each project
- Store data in a centralized database
  - Being developed by CWS and Industry
  - Web-based data entry and management with protection of confidential information
  - Access to CWS for data analysis



# Value of Shared Database

- Enhanced statistical power
  - can detect more subtle effects by pooling data from multiple projects
  - e.g., to evaluate displacement of breeding birds
- Consistent analysis methods
  - with raw data, can use comparable methods for carcass analysis

# Web-based data bases

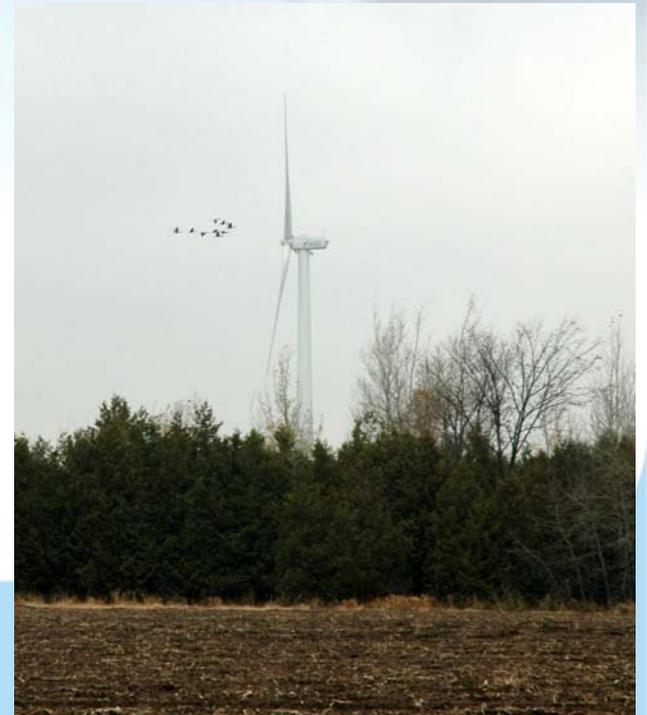
The screenshot shows the USGS Patuxent Wildlife Research Center website. At the top left is the USGS logo and the text "PATUXENT WILDLIFE RESEARCH CENTER". The main heading is "bird point count DATABASE" with a small graphic of birds and tally marks. Below this is the text "A repository for bird point count data collected anywhere in North America". There are three navigation links: "data retrieval", "data entry", and "more info". A photograph of a person in a field is visible. At the bottom, there is a URL and update information: "This page is: http://www.pwrc.usgs.gov/birdpoint Last updated: June 2001. U.S. Department of the Interior, U.S. Geological Survey Patuxent Wildlife Research Center | Comments and Feedback | Disclaimer".

- proponents could log in to enter own data
- CWS researchers can retrieve data

The screenshot shows the Ontario Breeding Bird Atlas website. At the top left is the "BIRDS ONTARIO" logo with a bird icon. The main heading is "Ontario Breeding Bird Atlas". Below this are navigation links: "Find Coordinates", "Reference Sheets", "Instructions and FAQ", and "Contact us". At the top right, it says "Site hosted by Bird Studies Canada". The main content area is titled "ATLAS DATA ENTRY" and shows a user logged in as "Denis Lepage (#48001)". There are links for "Log off or change user", "Review personal info", and "Modify your list of squares". It shows "Number of active sessions: 1" and a "Select a square" dropdown menu with "Year: 2001" selected. Below this is the text "Select a square and year, and then click the type of data you would like to enter or review." and a link for "Tools for Administrators and Regional Coordinators". There are four photographs of birds with captions: "Breeding Evidence" (a bird on a nest), "Point Count" (a bird on a branch), "Rare/Colonial Species" (a yellow bird on a branch), and "Nest Record" (a bird on a branch). At the bottom, it says "photos courtesy of Mark Peck (KILL, HOWA), Daryl Coulson (RTHU) and Heidi den Haan (BTGHW)".

# Summary

- CWS, Canadian Wind Energy Association (CANWEA), Industry working together
- Desire to have consistency across country
- Learn as we go
- Minimize future impacts





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