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Wind energy and impacts on wildlife: the Canadian experience

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Outline

- 1. Wind energy in Canada
- 2. The EA process
 - Federal/provincial triggers
 - Responsible authorities
- 3. Wildlife studies
 - Requirements
 - Species of special concern
- 4. Ongoing studies/projects



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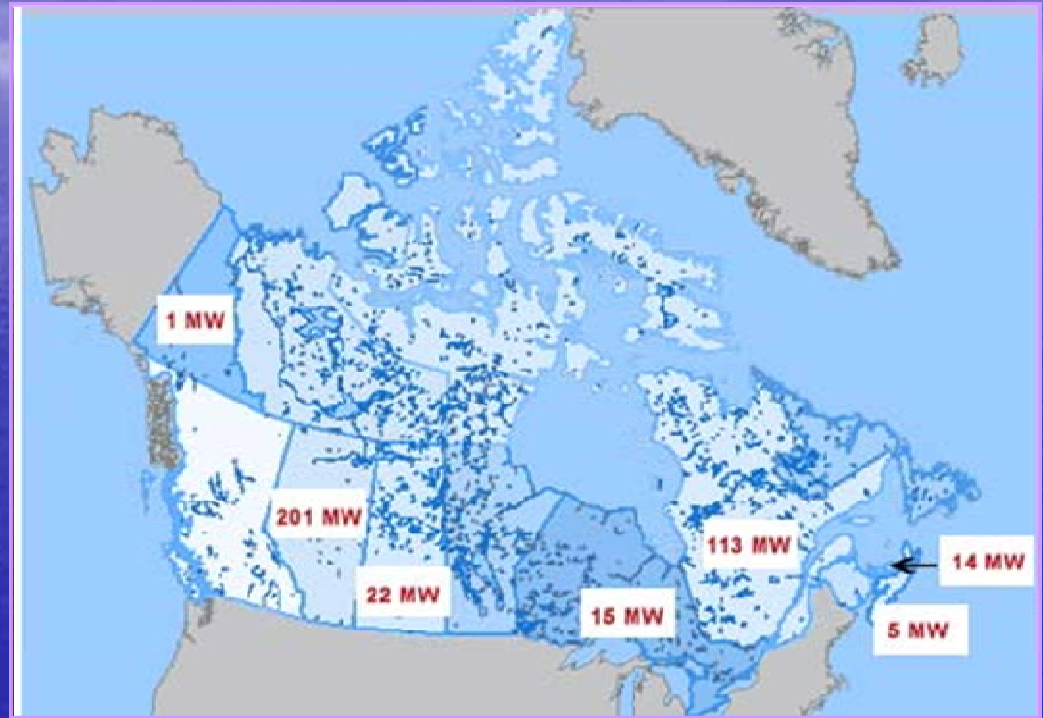
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1. Wind Energy in Canada

- Total MW in Canada : 370 MW
- Annual growth rate >30% in past 5 yrs
- Largest single project capacity: 100 MW



Source: Canadian Wind Energy Association



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1. Wind Energy in Canada: current facilities

Province/ Territory	Total MW	Capacity @ largest site	# sites	Technology
Yukon	0.8	0.8	1	1 Bonus 150, 1 Vestas V47
Alberta	201	75	11	Mostly Vestas (V44, V47) and Kenetech (KVS-33M); Nordex N60, GEWind, Lagerway, NEG-Micon, Vestas V80, Energcon,
Saskatchewan	22	11.2	2	Vestas V47
Ontario	15	9	6	Vestas V47/V80, Tacke TW600, Lagerway LW52
Québec	114	100	5	NEG-Micon NM750, Vestas V80 Jeumont J48c
Nova Scotia	4.9	3.6 (30.6)	3	Turbowinds T600, Vestas V47 and V80
PE Island	13.6	10.6	2	Vestas V47, Vestas V90



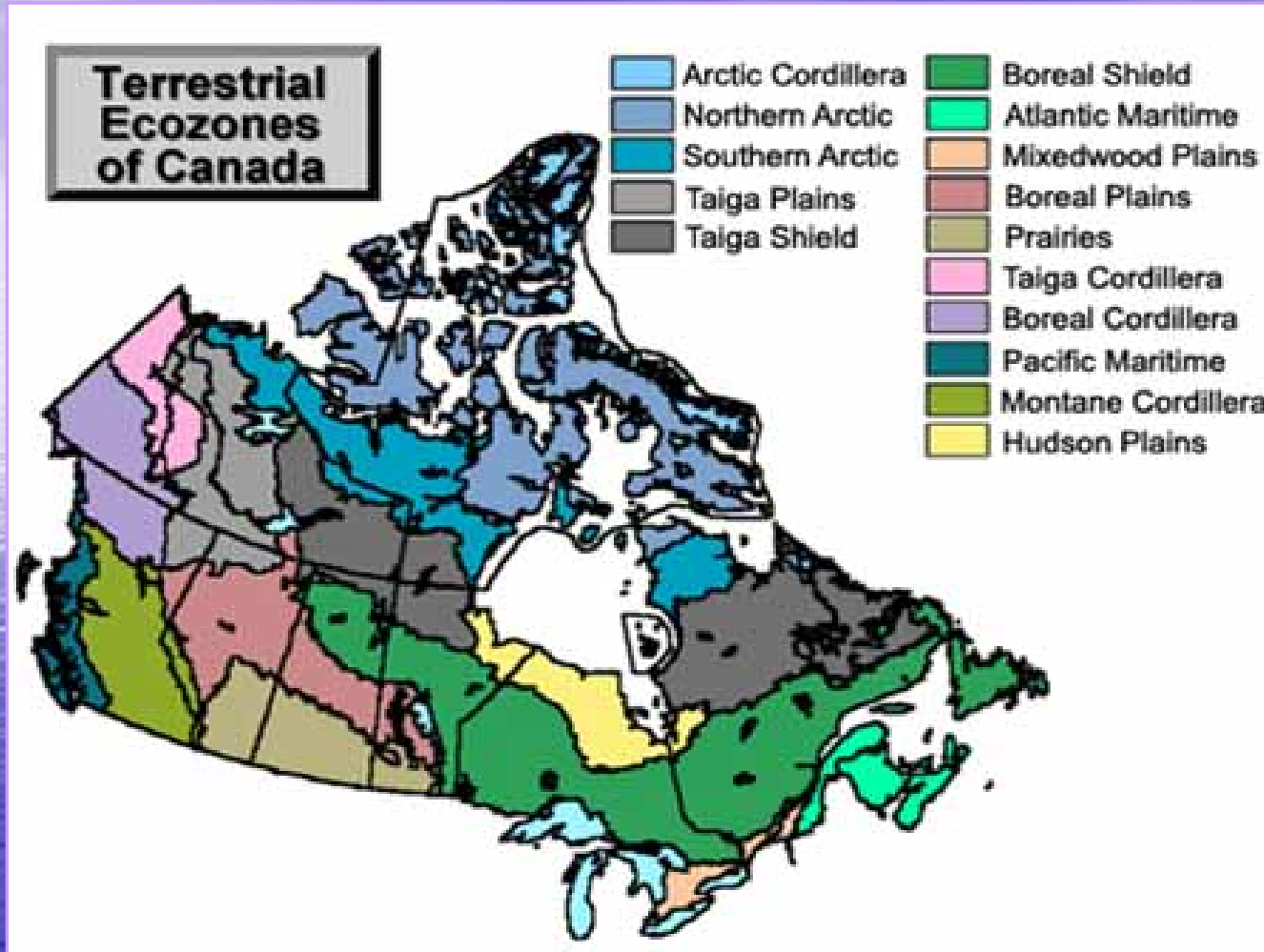
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1. Wind energy in Canada: ecological settings



Ecozones:

- Atlantic maritime
- Mixedwood plains
- Prairie
- Boreal Shield



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2. The EA process (federal)

- Canadian Environmental Assessment Act (CEAA)
- Four EA triggers at the federal level:
 - A federal authority is the project's proponent
 - A federal authority is financially involved in the project
 - The project makes use of federal lands
 - A federal authority issues a permit or licence (law list)
 - E.g. Fisheries' Act, Navigable Water's Protection Act
- Minister can refer project to mediator or review panel if judged that project *may cause significant adverse environmental effects*
- Duration of EA process: variable



2. The EA process (federal)

- Responsible authority (RA) and the coordination process;
 - Is another federal authority (FA) likely to exercise a power in respect of project?
 - Is another FA likely to be in possession of specialist or expert information?
 - e.g. Environment Canada : migratory birds and species at risk
- Advice from other FA taken into account by RA
- Responsible authorities:
 - NRCan (Natural Resources Canada) – typically (financial)
 - DFO (Fisheries and Oceans)
 - Others...



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WPPI: Wind Power Production Incentive

- Main trigger for federal EA process so far
- Canadian Ministry of Natural Resources (NRCan)
- WPPI started in 2001:
 - 1000 MW and CAN\$ 260 M over 5 yrs
 - April 1, 2002 to March 31, 2003: 1.2¢/kWhr
 - March 31, 2003 to March 31, 2006: 1.0¢/kWhr
 - March 31, 2006 to March 31, 2007: 0.8¢/kWhr
 - Minimum nameplate capacity: 500 kW (20kW in northern and remote locations)
- In May 2004: 24 projects totalling 976 MW



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Federal responsibility

- Federal government has responsibility for:
 - Federal lands
 - Aquatic species
 - Migratory birds (under *Migratory Birds Convention Act*, 1994)
 - Species at risk
- For other species, provinces and territories are given first opportunity for protection
- 6 provinces have species-at-risk legislation: NS, NB, QC, ON, MB and NL



Photo: J.P. Goossen, CWS



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SARA: the Canadian Species-At-Risk Act

- 2004 (June 1st) : all sections came into force
- SARA lists 233 species
- SARA makes it an offence to:
 - Kill, harm, harass, capture or take an individual of a listed species
 - Possess, collect, buy, sell or trade an individual of a listed species
 - Damage or destroy residence of a listed species



Photo: Léo-Guy de Repentigny



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2. The EA process (provincial)

- RA is usually Environment or Natural Resources
- Harmonization process between federal/provincial governments (BC, AB, SK, MB, QC, ON)
 - To achieve greater efficiency when EA is required
 - To foster cooperation between involved parties
- What role does wildlife protection legislation play?



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2. The EA process (provincial) : triggers

<i>Province</i>	<i>Utility</i>	<i>Comment</i>
Yukon	none	CEAA triggers (mirror act)
British Columbia	50 MW	
Alberta	none	
Saskatchewan	ALL	All “developments”
Manitoba	ALL	All “undertakings”
Ontario	2 MW	
Québec	10 MW	
New-Brunswick	3 MW	
Nova Scotia	2 MW	
Prince Edward Island	None	Discretionary
Newfoundland & Labrador	ALL	All “undertakings



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3. Wildlife studies: requirements

- Responsible authority is generally the advisor
 - May refer to other authority for expertise
 - e.g. Canadian Wildlife Service
 - May have own guidelines for studies
 - NRCan (WPPI)
- Currently: no consensus
 - Largely on a case-by-case basis
 - Access to information: difficult
- Weight of wildlife studies in decision-making:???



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3. Wildlife studies: requirements

- Requirements vary for provincial and federal authorities
- Requirements vary for each project – case-by-case basis
 - Typically:
 - General assessment of site
 - Point count and acoustic avian surveys during spring and fall migrations (2 days?)
 - Post-construction bird strike surveys
 - carcass searches, scavenging and searcher efficiency studies



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3. Wildlife studies: special concerns

- In general; species-at-risk, raptors, bats
- SARA-listed species
 - Marbled Murrelet (threatened - Schedule 1)
 - Bicknell's Thrush (special concern - Schedule 3)
 - Piping Plover (endangered - Schedule 1)
 - Roseate Tern (endangered - Schedule 1)
 - Peregrine Falcon
 - Subspecies *anatum* (threatened – Schedule 1)
 - Subspecies *pealei* (special concern – Schedule 1)
 - Subspecies *tundrius* (special concern – Schedule 3)
 - Ferruginous Hawk (special concern – Schedule 3)
 - Harlequin Duck (special concern – Schedule 1)
 - Barrow's Goldeneye (special concern – Schedule 1)



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4. Some ongoing EAs (> 1 MW)

Province	Proposed projects	EA level
British Columbia	Holberg (58.5MW) Knob Hill (450 MW) Nai Kun (700 MW) – pre-application	Federal (NRCan) / Provincial Federal (Fisheries) / Provincial Provincial
Ontario	Prince (200 MW) Wainfleet (10 MW) Wolfe Island (120-240 MW)	Federal (NRCan) / Provincial Federal (NRCan) / Provincial Federal (NRCan) / Provincial
New Brunswick	Dark Harbour (19.8 MW)	Federal (NRCan) / Provincial
Nova Scotia	Creignish (1.98 MW) Irish Mountain (1.98 MW) MARLANT (1.32 MW)	Federal (NRCan) Federal (NRCan) Federal (Defence / NRCan)



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4. Ongoing studies: some examples

- Atlantic Cooperative Wildlife Research Network
 - Migration studies using stable isotopes
 - Marine RADAR monitoring of nocturnal migrations
- Environment Canada weather radars for migration monitoring
 - Université du Québec à Chicoutimi
- Radar monitoring of Marbled Murrelets and bats in BC
- EchoTrack Inc. and bird/bat monitoring in Alberta (baseline study)
 - Radar-acoustic tracking of individual birds and bats during migration
 - Pre- and post-construction comparison



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Canada's Wind Energy Future...

- Many incentives for “green” energy projects
- An example: Hydro-Québec's request for proposals
 - 1000 MW of wind-generated electricity by 2012
 - Strong regional component
 - Bids opened June 2004 – results mid-September 2004
 - Total bids: 4000 MW



Photo: Yves Aubry



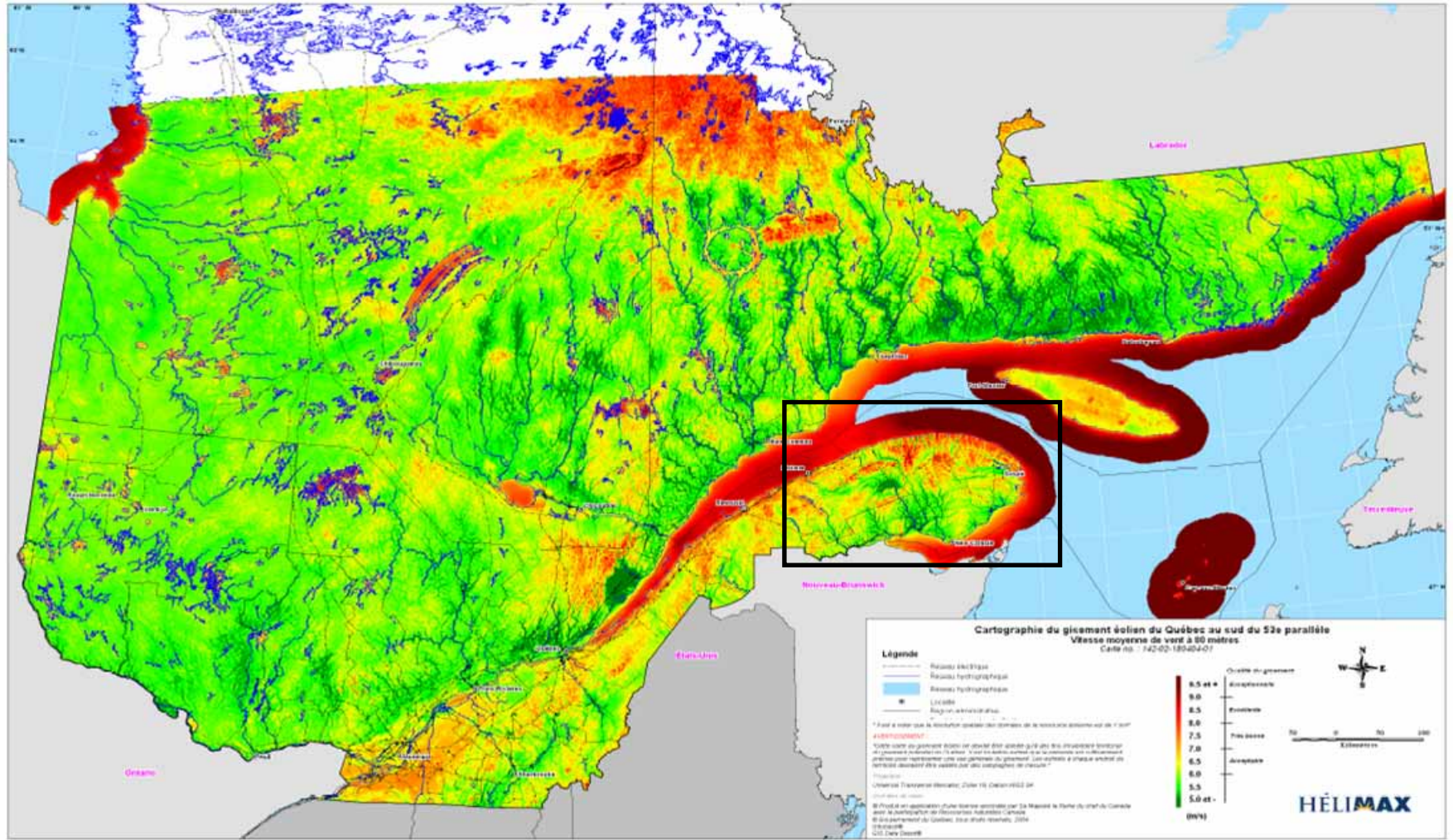
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Wind energy potential in Québec



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Total potential > 100 000 MW

A Canadian Initiative: the TSBBWG

- Tall Structures and Birds/Bats Working Group
- Objectives:
 - To facilitate cooperation between federal/provincial governments, industry and conservation groups
 - To improve knowledge of bird migration behaviour (routes, timing, etc.)
 - To develop clear guidelines for wind energy projects
- Focus is on tall structures
 - Wind turbines
 - Communication towers



Photo: Yves Aubry



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Thank you!

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Some useful links...

- Environment Canada
 - www.ec.gc.ca
- Canadian Wildlife Service
 - www.cws.ec.gc.ca
- Canadian Environmental Assessment Agency
 - www.ceaa-acee.gc.ca
 - Registry: www.ceaa-acee.gc.ca/050/index_e.cfm
- Canadian Wind Energy Association
 - www.canwea.ca



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