

# WILDLIFE SITING GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS



Saskatchewan Ministry of Environment

No. 2016-FWB 01

September 2016

Fish, Wildlife and Lands Branch  
Ministry of Environment  
3211 Albert Street  
Regina, Saskatchewan S4S 5W6

# **WILDLIFE SITING GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS**

First Edition 2016

## **PUBLISHED BY:**

### **SUGGESTED CITATION FOR THIS MANUAL**

Saskatchewan Ministry of Environment. 2016. Wildlife Siting Guidelines for Saskatchewan Wind Energy Projects. Report No. 2016-FWB 01. Saskatchewan Ministry of Environment, 3211 Albert Street, Regina, Saskatchewan. 10 pp.

### **ACKNOWLEDGEMENTS**

Alberta's Environment and Sustainable Resource Development Ministry is gratefully acknowledged for providing its Sensitive Species Inventory Guidelines April 2013 document and its permission to adapt the guidelines for Saskatchewan. The document provided a base reference and content source for personnel conducting respective species surveys in Saskatchewan.

### **COVER PHOTO CREDITS**

Ministry of Environment

### **CONTACT**

For more information, please contact our Client Service Office:

Email: [centre.inquiry@gov.sk.ca](mailto:centre.inquiry@gov.sk.ca)

Phone (toll free in North America): 1-800-567-4224

Phone (Regina): 306-787-2584

### **COPYRIGHT**

Brand and product names mentioned in this document are trademarks or registered trademarks of their respective holders. Use of brand names does not constitute an endorsement. Except as noted, all illustrations are copyright 2016, Ministry of Environment.

**Table of Contents**

POLICY OVERVIEW ..... 1

- 1.1 Intent** ..... 1
- 1.2 Principles** ..... 1
- 1.3 Scope and Application**..... 2
- 1.4 Regulatory Framework**..... 2

BENEFITS AND RISKS OF WEPS..... 3

- 2.1 Benefits of Wind Energy Development in Saskatchewan**..... 3
- 2.2 Risks to Wildlife: Collisions with Wind Turbine Generators (WTGs)** ..... 4
- 2.3 Risks to Wildlife: Disturbance and Displacement of Species (Including Species at Risk)** ..... 4
- 2.4 Risks to Wildlife: Habitat Loss and Disturbance**..... 4

GUIDELINES ..... 5

- 3.1 Avoidance Zones** ..... 5
- 3.2 Pre-construction Planning and Surveys**..... 6
- 3.3 Site level considerations to further avoid impacts on wildlife and habitat** ..... 7
- 3.4 Infrastructure Design Considerations** ..... 8

FUTURE GUIDANCE: COMPENSATORY MITIGATION, POST-CONSTRUCTION MONITORING AND ADAPTIVE MANAGEMENT..... 9

EVOLUTION OF WILDLIFE SITING GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS..... 9

Appendix A. Wind Energy Project Avoidance Zones..... 10

## POLICY OVERVIEW

### 1.1 Intent

These guidelines provide advice to proponents on siting considerations for wind energy projects (WEPs).

In 2015, the Government of Saskatchewan announced a target of 50 per cent renewable energy generation capacity by 2030, significantly relying on wind energy. The Ministry of Environment consulted with SaskPower on the development of these guidelines to assist wind energy developers in choosing locations that limit potential impacts to wildlife species and biodiversity.

This guidance supports responsible development of wind energy in Saskatchewan. These siting guidelines may assist wind energy proponents to enhance environmental performance, avoid environmental risks and associated liabilities, expedite environmental approvals, and reduce costs associated with operational restrictions or other measures possibly required to manage preventable impacts on biodiversity.

Good mitigation planning alone does not remove the proponent's responsibility to ensure compliance with federal and provincial statutes. Since avoidance and minimization are risk reduction approaches encouraged by the Government of Canada, following the guidance may reduce the likelihood of intervention or legal action under the federal *Migratory Bird Convention Act* or the *Species at Risk Act*.

Impact avoidance through proper siting and pre-project planning is only one element of the proponent's broader environmental management efforts.

### 1.2 Principles

These guidelines are based upon Ministry of Environment principles favouring:

- i) **an outcomes-based approach to development approvals** that encourages proponent innovation and enables informed business decisions based on environmental risk.
- ii) **a hierarchical approach to impact mitigation**, wherein development impacts are managed through a step-wise progression of actions to avoid, minimize and offset adverse effects (Box 1).
- iii) **precautionary adaptive management approaches**, whereby development approvals are implemented based on the best available information, subsequent outcomes are systematically monitored, and actions are strategically adjusted to improve performance over time.

Wind energy development is relatively new to Saskatchewan and, consequently, little data exists on the actual impacts of wind energy projects at specific locations. To manage this uncertainty, the ministry recommends an adaptive management approach to facilitate sound decision making. This approach involves careful planning and prudent decisions based on best available information, monitoring and evaluation to assess the effectiveness of various environmental management practices, and adaptation to further optimize impact mitigation. This process will inform future management decisions and improve management effectiveness over time.

The ideal (and potentially most cost-effective) mitigation solution is avoiding and minimizing adverse impacts entirely. In reality, this outcome is not always achieved and “adaptive minimization,” or even compensatory actions (offsets), may be necessary to balance potential adverse impacts.

**Box 1: Desired outcomes of mitigation:**

**Avoid** sensitive areas through good siting.

Use best practices to **minimize** operational impacts; the project site and associated infrastructure are reclaimed and restored to pre-development function.

**Offset** residual impacts, including landscape disturbance and fragmentation effects.

**Monitor** outcomes to prove mitigation actions successful.

### 1.3 Scope and Application

These guidelines are a planning and decision-support tool for WEP proponents in Saskatchewan. They set out ministry standards, expectations and advice to support siting and early planning of new WEPs to avoid and minimize biodiversity impacts, and to guide pre-construction wildlife and habitat assessment aimed at achieving regulatory compliance.

### 1.4 Regulatory Framework

These guidelines complement the Saskatchewan Environmental Code (code). They align with the ministry’s transition to results-based regulation and outcomes-based approaches that enable acceptable development in balance with the conservation and sustainable use of natural resources. Divergence from these guidelines is likely to require increased regulatory scrutiny, a more extensive environmental review, and may increase the potential for public concern.

Wildlife and their habitats are protected in Saskatchewan under a combination of provincial and federal legislation including *The Environmental Management and Protection Act, 2010* (EMPA, 2010), *The Environmental Assessment Act* (EAA), *The Wildlife Habitat Protection Act* (WHPA), *The Water Security Agency Act* (WSAA), the federal *Species at Risk Act* (SARA), *Canadian Environmental Protection Act* (CEPA), *Fisheries Act*, and *Migratory Birds Convention Act* (MBCA). Regulations pursuant to the MBCA provide for the conservation of migratory birds and the protection of their nests and eggs. Additionally, SARA prohibits the killing, harming or harassing of listed species, the damage or destruction of their residences, and the destruction of critical habitat. The individual or company must comply with all applicable legislation at all times. The ministry or other agencies responsible for the legislation may exercise their powers of enforcement in situations of non-compliance.

The EAA requires that a proponent receives the approval of the Minister of Environment (the Minister) before proceeding with a development that likely has significant environmental impacts. The EAA also authorizes Ministerial Determinations to be made on whether a project is a development. The

Ministerial Determination provides legal certainty if an environmental impact assessment (EIA) is needed.

The Act defines “development” to mean any project, operation or activity, or any alteration or expansion of any project, operation or activity, which is likely to:

- i) have an effect on any unique, rare or endangered feature of the environment;
- ii) substantially utilize any provincial resource, and in doing so, pre-empt the use, or potential use of that resource for any other purpose;
- iii) cause the emission of any pollutants or create by-products, residual or waste products which require handling and disposal in a manner that is not regulated by any other Act or regulation;
- iv) cause widespread public concern because of potential environmental changes;
- v) involve a new technology that is concerned with resource utilization and that may induce significant environmental change; or
- vi) have a significant impact on the environment or necessitate a further development, which is likely to have a significant impact on the environment.

WEPs will be screened by the Ministry of Environment’s Environmental Assessment and Stewardship Branch to determine whether they are “developments” under the EAA. If WEPs are determined to be “developments” they will be required to conduct an environmental impact assessment to identify and characterize the potential environmental impacts that may occur as a result of the project. If projects are determined not to be “developments,” an EIA will not be required and the Ministry of Environment will issue a Ministerial Determination that could include legally binding terms and conditions for mitigation, monitoring, mortality thresholds and anything else considered necessary to effectively regulate the activities.

***All proposed wind energy projects must undergo an environmental screening as described above.***

Guidance materials for preparation of a technical proposal, and information on the process to apply for a Ministerial Determination under the EAA, are available on the ministry’s website and from the Environmental Assessment and Stewardship Branch. New WEPs may also be subject to *The Planning and Development Act, 2007* (PDA) and its associated regulations, siting guidelines for weather and air defence radar, Transport Canada guidelines pertaining to developments near aerodromes and/or others. These considerations are outside the scope of the current guideline. Proponents are responsible to comply with these and other provincial and federal legislation, regulations and guidelines.

## **BENEFITS AND RISKS OF WEPS**

### **2.1 Benefits of Wind Energy Development in Saskatchewan**

Saskatchewan has a tremendous wind energy resource with the potential to reduce the province’s greenhouse gas (GHG) emissions from electricity generation. Wind energy also produces electricity without emitting air pollutants, particulate matter or other wastes. It also requires much less water usage than conventional power plants. In 2015, the Government of Saskatchewan committed to greater

wind energy production as part of a broader plan to expand renewable energy sources in Saskatchewan's electricity supply. In general, the conservation community supports the development of wind energy. However, all energy sources, including wind, carry some degree of environmental risk. The following sections summarize some potential risks of wind energy development to wildlife and their habitat.

## **2.2 Risks to Wildlife: Collisions with Wind Turbine Generators (WTGs)**

Direct mortality occurs when birds and bats collide with WTGs, associated infrastructure, or the electrical transmission lines associated with WEPs. A range of variables are believed to affect the measured rates of collision mortalities including location of WTGs, time of year, climate and scavenger removal rates. Site selection is the key determinant of collision mortality in birds. Available research suggests the risk of direct impacts on birds and bats is higher where WTGs are situated in proximity to migration corridors or natural features that attract or concentrate flying species (e.g. large river valleys, and the edge of ridgetops and bluffs). Staging areas and migration stopover sites such as wetlands and lakes are also higher risk locations for collision mortalities.

## **2.3 Risks to Wildlife: Disturbance and Displacement of Species (Including Species at Risk)**

Sensory disturbance from increased noise and light is associated with construction and operation of WEPs. Some sources indicate that disturbance during breeding and wintering may be the most adverse effect of WEPs on birds. These effects may be especially important in prairie habitat where certain susceptible bird species breed.

Displacement effects from wind turbines vary among species, with some more sensitive than others. Delayed effects are more prevalent for species with high breeding site fidelity. Experience in other jurisdictions indicates WEP construction and operation may result in the direct removal or avoidance of previously-used breeding, roosting and foraging habitat.

## **2.4 Risks to Wildlife: Habitat Loss and Disturbance**

Individual turbines need to be spaced widely to operate effectively. This means WEPs containing even a small number of individual turbines can have a substantial footprint. Habitat loss or degradation can impact all species that utilize the affected area, including those less susceptible to mortality from collisions with turbines. Construction of roads, towers, turbine pads, and other infrastructure within a WEP can physically destroy suitable habitat from an impacted area and/or displace species from otherwise suitable habitat near a WTG or associated infrastructure. Native habitats are particularly vulnerable to these effects, including fragmentation of intact habitat areas into smaller patches unsuitable to sustain populations of sensitive species. The environmental costs of these indirect impacts may be greater than direct mortality from collisions with WTGs.

Native prairie is a special concern in Saskatchewan. Native prairie is unbroken or undisturbed grassland or parkland dominated ( $\geq 51$  per cent) by perennial native plant and wildlife species. Greater than 80 per cent of native prairie in Saskatchewan has been converted to other uses and ongoing loss and fragmentation of remnant areas continues. Native prairie provides crucial habitat for a large number of species (including Species at Risk), and generates important ecosystem services (e.g. erosion protection,

water retention and filtration, carbon storage). These ecosystem services are increasingly difficult to sustain in small residual patches of native prairie. Once converted to other uses, native prairie is almost impossible to restore to pre-disturbance condition and function. ***For these reasons, avoidance of native prairie is strongly encouraged in all WEP development proposals.***

## GUIDELINES

### 3.1 Avoidance Zones

New WEPs will achieve more balanced economic and environmental outcomes where they are sited to avoid preventable impacts on wildlife habitat, birds, bats and other biodiversity. Siting new WEPs at higher-risk sites may result in approval delays, costly operational restrictions or could confer higher environmental assessment and compliance costs.

The Ministry of Environment has identified WEP avoidance zones where the risk of ecological impacts and/or public concerns related to WEP development is believed to be high (see Appendix A). The avoidance zones include:

- i) A prescribed buffer of five kilometres around and inclusive of designated environmentally sensitive areas including:
  - national parks
  - provincial parks
  - Last Mountain Lake National Wildlife Area
  - Important Bird Areas
  - Western Hemispheric Shorebird Reserve Network sites
  - Ecological reserves
  - Last Mountain Lake
  - North Saskatchewan River
  - South Saskatchewan River
  - Frenchman River
  - Qu'Appelle River
  - Assiniboine River
  
- ii) Areas without prescribed setbacks from designated areas including:
  - Fish and Wildlife Development Fund lands
  - conservation easement areas
  - *The Wildlife Habitat Protection Act* lands
  - critical habitat for Species at Risk
  - Federal National Wildlife Area Lands outside Last Mountain Lake NWA

Avoidance zones are designed to aid in wind energy planning by identifying areas considered to pose high risks to biodiversity. ***Proponents are still required to evaluate WEP siting at specific locations outside the avoidance zones, as these location may still significantly impact wildlife.*** Proponents

should plan carefully to avoid such risks and must submit a detailed, project-specific technical proposal for evaluation by the ministry as described in Section 1.4.

In keeping with its precautionary adaptive approach, the ministry will assess and evaluate the effectiveness of the avoidance zones, and may adjust these criteria as additional WEPs come online and new evidence is gathered. The ministry will also update planning materials as new habitat and species information becomes available (e.g. critical habitat mapping, predictive species modelling results, and prairie and wetland inventory results, or other relevant new information).

### **3.2 Pre-construction Planning and Surveys**

There are local differences in wildlife populations and movement patterns, habitat, area topography, facility design and weather. Accordingly, each proposed development site is unique and requires detailed evaluation. Detailed pre-construction planning and surveys will identify potential risks and how they will be minimized early in the planning process. The following planning steps should be followed:

- i) Search the Saskatchewan Conservation Data Centre (SKCDC) and other conservation databases to help determine the presence of historical species occurrences and habitat features, and to guide species detection surveys.**

Conduct a database search of the project area, plus a one kilometre buffer zone surrounding the proposed project footprint, as well as any areas where expansion of the project footprint is anticipated. The recommended search area is based upon the maximum setback distance likely to be recommended in the [Activity Restriction Guidelines for Sensitive Species \(ARGs\)](#), available in the saskatchewan.ca Publication Centre. Both construction and operation phases of WEPs are considered to be in the high disturbance category for the purposes of the ARGs.

- ii) Review available literature and resources to determine any significant landscape features that may attract or serve as important habitat for wildlife, including:**
  - native grasslands;
  - areas that attract, funnel or serve as travel corridors for wildlife, such as passes, peninsulas, prominent ridges, the tops of steep river valley “breaks”, coulees, small mammal colonies;
  - wetlands, streams, water bodies and associated riparian areas;
  - Other natural lands such as woodlands or forest lands

WEP siting should seek to avoid disruption and/or disturbance of natural lands connecting significant landscape features.

Data searches, literature searches and interviews should be conducted to determine land tenure and to evaluate the potential of the proposed project area to impact habitat for migrating, wintering and breeding birds and bats, as well as any Species at Risk or other species contained in the ARGs.

- iii) **Conduct field investigations to verify habitat types identified in Steps i and ii and to determine any additional relevant habitat features.**

Ministry of Environment Fish, Wildlife and Lands Branch should be consulted if any part of the project may be located on Crown land.

- iv) **Following consultation with the Ministry of Environment's Fish, Wildlife and Lands Branch conservation standards specialist, conduct appropriate pre-construction species detection surveys within the proposed project area and associated buffer zone.**

Plant and wildlife surveys must be conducted in all areas of suitable habitat that may be impacted by the proposed project using the Ministry of Environment [Species Detection Survey Protocols](#). If the ministry does not have a protocol, the selected method must be approved by the Fish, Wildlife and Lands Branch.

Surveys must be conducted by personnel who meet requirements contained in the [Species Detection Survey Protocols](#).

Data for all surveys must be submitted in loadform format, to the Conservation Data Centre ([env.researchpermit@gov.sk.ca](mailto:env.researchpermit@gov.sk.ca)) with an accompanying narrative summary describing any deviations from survey protocols. Results are to be submitted in accordance with requirements contained on the [species detection webpage](#) and in a format consistent with requirements of the Wind Energy Bird and Bat Monitoring Database.

### 3.3 Site level considerations to further avoid impacts on wildlife and habitat

Avoiding biodiversity impacts through proper siting of new WEPS is arguably the most critical ingredient in good mitigation planning. "Avoidance zones" delineated in Section 4.1 are considered high-risk sites. As indicated above, siting new WEPS in these locations may result in approval delays, costly operational restrictions or could confer higher environmental assessment and compliance costs. Areas outside these avoidance zones are believed to be lower risk sites more suited for wind energy development. Potential risks to biodiversity may still be present at sites outside these avoidance zones and proponents are encouraged to conduct appropriate site level assessment to further avoid and minimize potential impacts.

The following guidance was compiled from various sources including *Wind Turbines and Birds: A Guidance Document for Environmental Assessment*<sup>1</sup> and is provided to help proponents further assess potential sites for new WEPS:

- i) Ideally, WEPS should be sited on previously altered landscapes such as areas of cultivation, near towns or in urban and industrial areas;

---

<sup>1</sup> Wind Turbines and Birds: A Guidance Document for Environmental Assessment available at <http://publications.gc.ca/site/eng/458437/publication.html>

- ii) Avoid siting WEPs in close proximity to natural lands, such as wetlands, woodlands and grasslands, especially large contiguous blocks of habitat and/or in landscapes with a high proportion (e.g. >30 per cent) of natural land in order to reduce risks to wildlife that breed, forage and migrate in and between these areas;
- iii) Avoid species at risk (SAR) and their habitat, especially areas with multiple SAR and/or SAR that avoid tall structures (e.g. greater sage-grouse);
- iv) Avoid landscapes that contain bird staging areas and migration corridors, including areas between bird staging sites and along major watercourses;
- v) Avoid sites that reconnaissance indicates are typically used by raptors and bats for foraging or nesting;
- vi) Avoid sites used by wildlife during critical periods such as for breeding and wintering (e.g. sharp-tailed grouse leks/breeding grounds, mule deer wintering habitat).

### **3.4 Infrastructure Design Considerations**

Proper design of wind energy projects can help minimize site-specific risks identified during site assessment. The following best practices are most readily incorporated early in planning and are therefore included here for siting and design consideration.

This is not a comprehensive list; wind energy development is relatively new to Saskatchewan and knowledge of potential impacts and solutions is continuously evolving. The effectiveness of minimization actions should be systematically monitored and evaluated to ensure they are performing as expected, and to enable adjustments over the lifespan of the project for optimum performance.

- i) Minimize roads, fences and other infrastructure; align roads to avoid habitat destruction and wildlife disturbance. Use existing roads and utility corridors to the greatest extent possible with any new access roads or utility corridors configured to avoid crossing native or other high-quality wildlife habitats.
- ii) Implement measures (e.g. automation) to minimize human disturbance at sites once construction is complete.
- iii) Use tubular towers rather than lattice towers to minimize bird perching and nesting opportunities.
- iv) When required by Transport Canada to install lights for aviation safety, incorporate the minimal number of lights and synchronized flashes per minute with minimum flash duration. Lighting for on-ground facilities should be reduced and down-shielded, and controlled by proximity sensors wherever possible.
- v) Where height of the rotor-swept area creates risk for wildlife, adjust tower heights to reduce risk of strikes where feasible.
- vi) Reduce above-ground power lines to avoid strikes and electrocution of birds. Where this is not feasible, lines should be designed to reduce the potential electrocution of large birds.

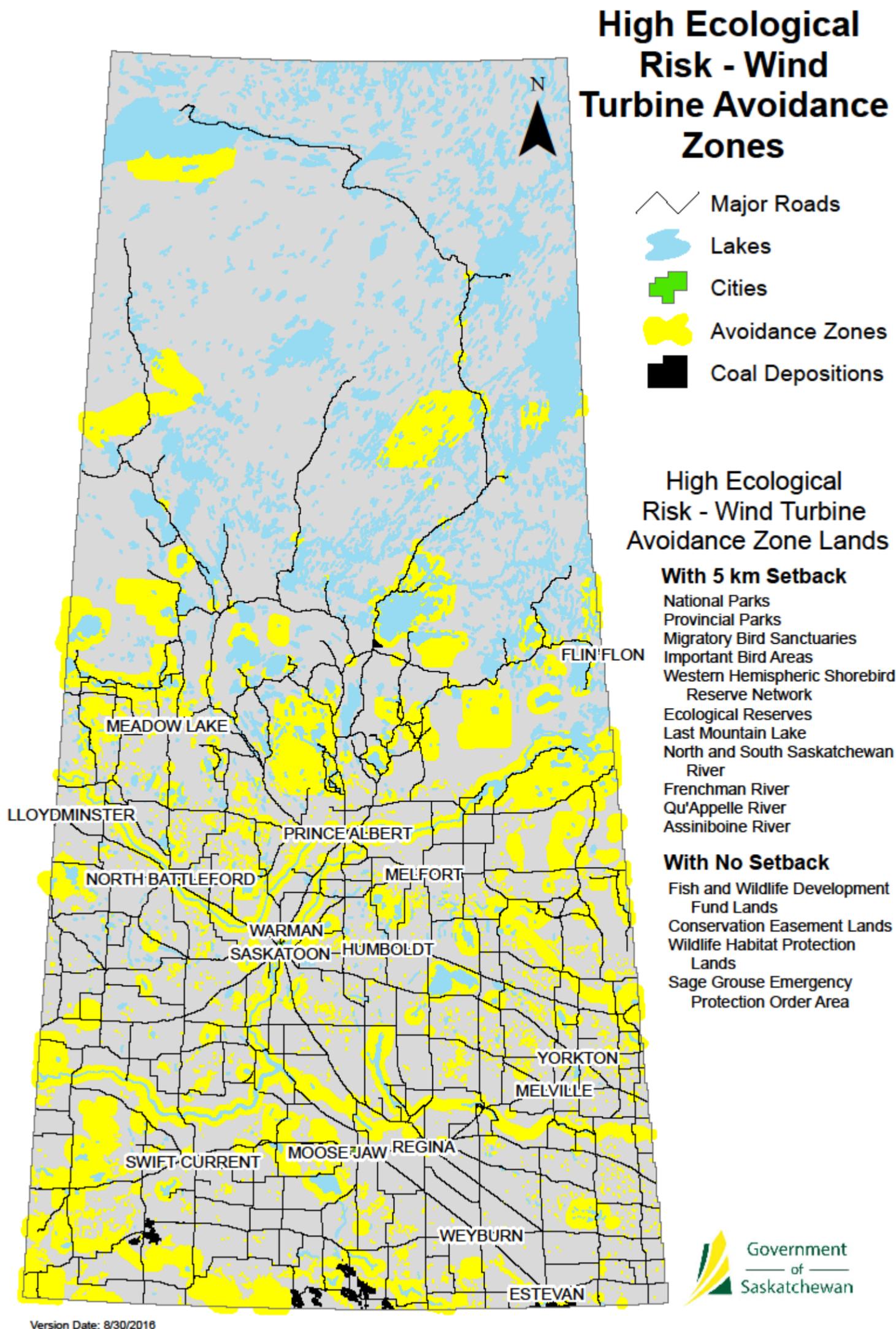
- vii) In areas of high seasonal bird or bat use, where monitoring shows a high incidence of strikes, turbine operation may need to be altered or shut down during periods of high concentration.
- viii) Turbines should be spaced so as not to inhibit bird movement, generally 200 metres or more.
- ix) Where there are high numbers of raptors, discourage use of the immediate project area by locating turbines away from perching opportunities, and away from areas of high concentrations of prey (e.g. ground squirrel colonies).
- x) Plan to reclaim any disturbed natural lands using native species and appropriate methods upon decommissioning, to reduce cumulative effects and accelerate restoration of pre-development function.

#### **FUTURE GUIDANCE: COMPENSATORY MITIGATION, POST-CONSTRUCTION MONITORING AND ADAPTIVE MANAGEMENT**

Guidance documents are presently under development for compensatory mitigation, post-construction monitoring and adaptive management requirements. Post-construction monitoring approaches will align with the bird mortality tracking database being developed by Environment and Climate Change Canada, Bird Studies Canada and CanWEA.

#### **CONTINUOUS IMPROVEMENT OF WILDLIFE SITING GUIDELINES FOR SASKATCHEWAN WIND ENERGY PROJECTS**

Wind energy development is relatively new to Saskatchewan and this guideline is a first generation product devised using best available information and input from key stakeholders. In keeping with an adaptive approach the Ministry of Environment will review these Guidelines and the recommended avoidance zones in consultation with industry and environment groups to further optimize responsible development and protection of the environment. Future editions may include enhanced mapping of risk zones or other tools to assist SaskPower and independent power producers to better target development to lower risk locations and more readily achieve compliance, mitigate potential adverse impacts and expand responsible production of wind energy in the Province.



<sup>2</sup> Detailed avoidance zone map data can be requested from Ministry of Environment, Environmental Assessment and Stewardship Branch