

These guidelines may be revised or amended based on changes in technology, scientific research updates including new methods to evaluate wildlife habitat, and/or new wildlife conservation goals or objectives.

GUIDELINES FACT SHEET

WIND POWER EXPLORATION AND DEVELOPMENT/ WILDLIFE & HABITAT

NOTE: BOLDDED TEXT DEFINED IN APPENDIX C

Purpose and Scope of this Fact Sheet

This Fact Sheet provides information to wind power proponents to be stewards of the environment operating in the Peace Region (Northeastern British Columbia) on Crown Land and is applicable to all activities associated with the industry from installation of temporary wind monitoring towers to commercial development/operation.

The information provides guidance to **avoid**, **minimize**, and **mitigate** adverse impacts on **wildlife** or **habitat** from proposed activities and assist in compliance with applicable legislation, regulation and policies. For the purposes of this Fact Sheet, the term wildlife includes fish and habitat.

The Fact Sheet includes the following sections:

- Purpose and Scope
- Background
- Wildlife Impact
- Objectives
- Guidelines
- Protection of Wildlife Checklist
- Feedback
- Table 1. Guidelines for Wind Power Activities
- Appendix A: Important Wildlife Habitat
- Appendix B: Wildlife Sighting/Activity Response Form
- Appendix C: Glossary of Key Terms
- References

Background

Northeastern British Columbia has the greatest diversity and abundance of wildlife in the province, including the highest numbers of ungulates and carnivores. This wildlife resource has received recognition in land use planning, particularly the approved Dawson Creek, Fort Nelson, Fort St. John and Mackenzie Land and Resource Management Plans (LRMP).^{1, 2, 3, 4} These plans provide strategic direction which reflect areas of sensitive natural values, including wildlife, where precautions would be taken during resource development activities. Additional provincial initiatives to protect wildlife values include (but are not limited to) Old Growth Management Areas, Wildlife Habitat Areas and Ungulate Winter Ranges under the *Forest and Range Practices Act of British Columbia*.⁵

Wildlife Impact

The Ministry of Environment is concerned that the present and anticipated increase in wind power exploration and subsequent commercial activity in the Peace Region, may adversely impact the long-term viability of various wildlife populations.^{6, 7, 8, 9} Adverse impact(s) to wildlife may result from:

- noise and/or movement of machinery and aircraft;
- activity timing including associated reclamation;
- proximity to wildlife;
- frequency and duration of activities;
- objectives of reclamation activities;
- work site and access location;
- metal leaching/acid rock drainage;
- worksite practices; and,
- water use.

Objectives

Primary objectives of this Fact Sheet are:

- to provide wildlife information to wind power developers to avoid wildlife impacts and if avoidance is not feasible, ensure impacts are minimized and/or mitigated;
- contingency planning for unforeseen circumstances;
- to prevent contraventions of applicable legislation;
- to promote awareness of potential impacts to wildlife and/or their habitat.

Guidelines

1) Prior to undertaking wind power activities, proponents should collect relevant wildlife information by using/consulting:

- First Nations;
- Land and Resource Management Plans;
- Table 1 included in this Fact Sheet;
- Existing wildlife capability, Terrestrial Ecosystem or Predictive Ecosystem Mapping;

- Peace Region Selected Terrestrial and Aquatic Wildlife Least-Risk Windows (ftp://ftpprg.env.gov.bc.ca/pub/outgoing/Peace_Region_Wildlife_Values/Industrial_Sectors/Best_Management_Practices/Least%20Risk%20Windows%20June%2013'08.pdf);
- Other best management practices including - *Peace Region Guidelines for Aircraft Operations/Wildlife Interactions*¹⁰;
- Peace Region FTP site (ftp://ftpfsj.env.gov.bc.ca/pub/outgoing/Peace_Region_Wildlife_Values/);
- BC Conservation Data Centre (<http://www.env.gov.bc.ca/cdc/>);
- BC Fish Wizard (<http://www.fishwizard.com/>);
- BC Wildlife Species Inventory (<http://www.env.gov.bc.ca/wildlife/index.html>);
- Technical reports and other relevant literature;
- Government personnel, guide outfitters and trappers;
- All applicable legislation, including (but not limited to):
 - Provincial *Water Act* (http://www.qp.gov.bc.ca/statreg/stat/W/96483_01.htm)
 - Provincial *Wildlife Act* (http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm)
 - Provincial *Fisheries Act* (http://www.qp.gov.bc.ca/statreg/stat/F/96149_01.htm)
 - Provincial *Fish Protection Act* (http://www.qp.gov.bc.ca/statreg/stat/F/97021_01.htm)
 - Federal *Fisheries Act* (<http://laws.justice.gc.ca/en/ShowFullDoc/cs/F-14///en>)
 - Federal Species at Risk Act (<http://laws.justice.gc.ca/en/ShowFullDoc/cs/S-15.3///en>).

2) Using gathered information and Table 1 recommendations, a **qualified professional** prepares a written wildlife plan. An acceptable plan will endeavour to avoid adverse impacts to wildlife and/or habitat. If this is not possible, strategies to minimize or mitigate potential impacts should be developed prior to commencing wind power field activities. The plan should also include operational flexibility (contingency planning) to accommodate unforeseen conditions. At a minimum, a wildlife impact mitigation plan will:

- identify wildlife species that may be impacted by activities and appropriate least risk work windows;
- identify motor vehicle closures, Conservation Data Center element occurrences, notations of interest, Wildlife Habitat Areas, Ungulate Winter Range, **sensitive ecosystems**, parks and other protected areas, and other wildlife related land status;
- identify known or potential **important wildlife habitat** (see Appendix A);
- designate avoidance distances (as provided);
- predetermine suitable access and work sites to: maintain avoidance distances, provide visual screening and reduce frequency of disturbance near critical areas; and,
- provide information and location of activities by other industries in the area to assist in coordination to reduce impacts.

3) Prior to conducting any motorized activities within a Management Unit subject to the Provincial *Motor Vehicle Prohibition Regulation* (http://www.qp.gov.bc.ca/statreg/reg/W/Wildlife/196_99.htm) an application must be made to the Permit and Authorization Services Branch (<http://www.env.gov.bc.ca/pasb/applications.html>) for variance consideration.

4) For proposed works in and around water, the Federal *Fisheries Act* is the key statute regarding fish and fish habitat in Canada. Proponents should consult the Provincial *Water Act*¹¹ to determine if a Notification, Approval and/or other applicable permitting is required (http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html).

5) Wind power activities will often be faced with unpredictable circumstances. Recognizing that safe working conditions are paramount, the wildlife plan should include alternatives such as different access routes, equipment types and activity timing as well as a monitoring feedback mechanism which permits field observations to determine if there is an immediate requirement to change/alter activities.

6) Evaluate the management effectiveness of the wildlife plan – a process referred to as **adaptive management**. For example, the wildlife plan anticipates a desired outcome, and **monitoring** and evaluation of the actual outcomes can result in innovative, more efficient and effective future wildlife avoidance and mitigation procedures.

7) Relevant sections of the wildlife plan conveyed to all field personnel, prior to activity commencement.

8) Written wildlife reports (e.g. monthly submissions) provided to the Regional Office, Ministry of Environment. The Wildlife Sighting/Activity Response Form in Appendix B is an example of the relevant wildlife information collected, when possible.

Protection of Wildlife Checklist

Have you enlisted the best management practices to protect and maintain wildlife in the course of your operations? Try this checklist:

- Wildlife in the project area have been identified by consulting maps, local knowledge and other information.
- Activity plans avoid, minimize and mitigate impacts to wildlife by such measures as specified suitable access, least risk windows of operation, minimum approach distances and worksite locations.
- Field equipment used is the most suited to the task (e.g. provides the fewest number of visits and the least noise) and when possible, modified to accomplish this.
- Field personnel have received orientation to ensure they help minimize impacts on wildlife while getting the job done.
- Monitoring and contingency plans are in place to address unpredictable events.
- Field observations are used to refine wildlife plans for current and future activities.
- Applicable legislation, regulation and policies are adhered to (e.g. stream crossing Notifications/Approvals or motor vehicle permits have been submitted/acquired).

Feedback

To provide feedback regarding the clarity and usefulness of the information presented in this fact sheet, please contact:

Ecosystem Management Section
Ministry of Environment,
Peace Region
400 – 100003 110th Ave
Fort St John, British Columbia
(250) 787-3411

Table 1. Guidelines for Wind Power Activities

Note: alphabet superscript letters in the *Guidelines* column refer to activities in the *Activities* column the Guidelines apply to.

Activities	*Potential Impacts	Guidelines
A. aircraft use B. terrestrial machinery use C. camp construction and use D. access construction and use E. facility construction and use F. construction of sump pits and use G. waste dump establishment use H. withdrawal from watercourses I. fuel storage J. blasting, drilling, clearing K. stream crossings L. site reclamation	<ul style="list-style-type: none"> • segregation and/or forced movement of animals • physiological impacts on animals • increased human consumption of wildlife and fish due to improved/new access • increased wildlife predation due to improved/new access • terrestrial habitat fragmentation • loss of fish overwintering/rearing/spawning habitat • alteration/destruction of sensitive ecosystems • erosion and sedimentation • contaminated water in pits might be used • pollution and contamination from spilled fuel and other chemicals 	<ul style="list-style-type: none"> • Aircraft Best Management Practices^A • use native seed mixes^L • avoid caribou, sheep and mountain goat winter ranges, birthing and rearing areas^{B,C,D,E,F,G,I,J} • avoid sheep and mountain goat escape terrain^{B,C,D,E,F,G,I,J} • use proper storage practices for fuel and other toxic chemicals^I • observe least-risk timing windows for aquatic and terrestrial species^{B,C,D,E,F,G,H,I,J,K} • adhere to all applicable legislation^{All} • avoid important wildlife habitat as defined in Appendix A^{All except A}

*examples of potential environmental impacts - not a definitive list.

Appendix A: Important Wildlife Habitat

Important wildlife habitat should be mapped and described in wildlife plans, including:

Terrestrial

- o avalanche chutes;
- o birthing sites ;
- o breeding sites (e.g. leks, rutting areas);
- o concentrations of migrating birds;
- o caves;
- o cliffs;
- o mineral licks;
- o coarse woody debris;
- o colonies, rookeries;
- o cover;
- o denning sites for bears, cougar, lynx, wolves, and wolverines;
- o forests with interior conditions;
- o hibernacula;
- o nesting sites;
- o old growth, and Old Growth Management Areas;
- o open meadows;
- o rearing sites;
- o riparian islands;
- o riparian zones;
- o rubbing and scent posts/points;
- o security areas;
- o seeps, springs;
- o snags;
- o south- and/or west-facing slopes;
- o talus slopes;
- o travel and escape routes;
- o wallows;
- o wetlands;
- o wildlife trails;
- o wildlife tree patches;
- o winter range.

Aquatic

- o channel structure;
- o early (spring) open water;
- o groundwater flow, seeps, springs;
- o large woody debris;
- o logjam pools;
- o main channel pools (including, but not limited to depth, flow and volume characteristics), especially those immediately downstream of large boulders or stable, large woody debris;
- o off-channel pools near woody debris or overhanging banks;

- o rearing habitat;
- o riffle-pool junctions, especially under the cover of banks
- o riparian islands;
- o riparian zones;
- o spawning habitat;
- o substrate;
- o thermal pools;
- o undercut banks;
- o water flow – volume, seasonal variation (especially along dammed rivers/streams);
- o water temperature
- o wetlands.

Many of these habitats can be found on Terrain Resource Inventory Maps (TRIM), forest cover maps, and via air photo interpretation. Others would require field assessments and local/anecdotal information. Site-specific prescriptions can be agreed to by those parties involved during pre-development consultation and referral.

If during wind power activity, previously non-identified important wildlife habitat is encountered the proponent must:

- modify or stop any activity that is in the immediate vicinity of the previously unidentified habitat to the extent necessary to refrain from threatening it;
- promptly advise the appropriate managers and district environment official of the existence and location of the important wildlife habitat;
- if applicable, implement alternate options detailed in the wildlife plan.

Appendix B: Wildlife Sighting/Activity Response Form

This data form is intended to record wildlife encountered during wind power activities. Individuals completing the form are encouraged to take photographs as a record, provided the wildlife are not disturbed. Wildlife forms can be submitted to the Peace Region office of the Ministry of Environment.

Directions

- The first column identifies the wildlife species observed. If a species observed is not in this list, or is unknown, a short description should be included with the report. If a concentration of wildlife is observed, this should also be noted with a short description (for example, “many ungulates at a mineral lick”).
- The second column records the number of wildlife encountered per sighting, or best estimate.
- The third column generally describes the habitat the wildlife was observed in, using the key words provided and noting any special features. Include dominant plants of the area if possible. More than one habitat can be identified for each sighting. Key Words are provided to help describe the habitat.
- The fourth column identifies the observed activity. If an observed activity is not on this list, “other” is recorded in this column, and a short description is given in the comments. More than one activity can be identified for each sighting.
- The fifth column records the altitude the aircraft was operating at when the wildlife was observed (if applicable).
- Finally, the last column records the location of the wildlife, as accurately as possible, with an error estimate (+/-).

The codes used in the following tables are provided to help fill out the form. These codes were adapted from *Inventory Dataforms for Species Inventory Fundamentals: Standards for Components of British Columbia's Biodiversity No. 1 [Forms]*, prepared by the Ministry of Environment, Lands and Parks, Resources Inventory Branch for the Terrestrial Ecosystems Task Force, Resources Inventory Committee, March 1998 (version 2.0).

Wildlife Species Codes

Species	Code	Species	Code
Bear, Black	URAM	Moose	ALAL
Bear, Grizzly	URAR	Mountain Goat	ORAM
Caribou	RATA	Northern Goshawk	NOGO
Deer, Mule	ODHE	Osprey	OSPR
Deer, White-tailed	ODVI	Sheep, Stone's	OVDA
Eagle, Bald	BAEA	Wolf	CALU
Eagle, Golden	GOEA	Wolverine	GUGU
Elk	CEEL	Unknown	UNKN
Falcon, Peregrine	PEFA	Wildlife Concentration	CONC
Gyrfalcon	GYRF		

Habitat Key Words

Terrestrial	Riparian	Special Features
Forest Needleleaf	Big / Med River	Old Field
Forest Broadleaf	Creek	Cropland/Hedgerow
Forest Mixed	Spring	Suburban/Orchard
Old Forest	Hotsprings	Urban
Mature Forest	H / M / L Gradient	Ice
Shrubland	Pool	Rock Outcrop
Savanna	Riffle	Coarse Talus/Boulders
Grassland/Herbaceous	Floodplain	Scree/Fine Talus
Alpine	H / M / L Bench	Cliff
Subalpine	Sand/Gravel Bars	Sand/Dune
	Deep / Shallow Water	Snag/Hollow Tree
	River Mouth/Delta	Snow Free
	Herb Wetland	Moderate, Deep Snow
	Shrub Wetland	Moderate Slope
	Forested Wetland	Steep Slope
	Bog/Fen	N, S, E, W Aspect
	Temporary Pool	

Activity Codes

Code	Activity	Description
AL	Alert	<ul style="list-style-type: none"> activity with the purpose of detecting predators; e.g., guard or sentry duty or a heads-up rigid stance
BE	Bedding	<ul style="list-style-type: none"> bedding, sleeping, or resting above ground, including bedding for the purpose of cud chewing, and roosting and resting of birds
BI	Birthing	<ul style="list-style-type: none"> giving birth to young, including hatching of eggs of amphibians, reptiles, and birds
CO	Courtship	<ul style="list-style-type: none"> behaviour for the purpose of enticing a conspecific of the opposite sex into copulation, including copulation, courtship feeding, and defense of mates
DI	Disturbed	<ul style="list-style-type: none"> behaviour for the purpose of avoiding the observer use only if the activity before disturbance is not known
DR	Drinking	<ul style="list-style-type: none"> drinking
EX	Excreting	<ul style="list-style-type: none"> discharging waste through the anus
FD	Feeding	<ul style="list-style-type: none"> consuming food items, including feeding by animals that search for food and eat simultaneously; e.g., grazers, browsers, flying insectivores, and filter feeders does not include hunting
FG	Feeding, green-up	<ul style="list-style-type: none"> feeding during spring green-up
FL	Fleeing	<ul style="list-style-type: none"> hurried movement to avoid a conspecifics or other animals does not include fleeing to avoid the observer
GR	Grooming	<ul style="list-style-type: none"> behaviour for the purpose of arranging and protecting the fur, feathers, skin, etc., including scratching and rubbing of antler velvet
HU	Hunting	<ul style="list-style-type: none"> searching for, pursuing, and killing prey
LI	Living	<ul style="list-style-type: none"> the activity could not be specified due to ignorance or the activity was too diverse
MD	Migrating daily	<ul style="list-style-type: none"> traveling that is a regular daily activity, including traveling to or away from a communal habitat; e.g., a bat on its daily flight to or from a roosting site
MS	Migrating seasonally	<ul style="list-style-type: none"> traveling that is a regular annual activity; e.g., an elk or a Sandhill Crane on its migration route, or a snake traveling away from a communal habitat such as a hibernaculum
RR	Rearing	<ul style="list-style-type: none"> adults feeding neonates and juveniles
TE	Territoriality	<ul style="list-style-type: none"> behaviour for the purpose of marking or defending a territory; e.g., singing, drumming, winnowing, howling, antler rubbing, wallowing, and scraping the ground
TF	Traveling, flying	<ul style="list-style-type: none"> used when the purpose of flying is not known if the purpose is known, use a more specific description such as hunting
TP	Traveling on a path	<ul style="list-style-type: none"> walking on a trail that is embedded in the ground due to animals walking the same route for many years
TR	Traveling	<ul style="list-style-type: none"> traveling by a method other than flying, swimming, and walking; usually used for animals that do not normally fly, swim, or walk includes seeing an isolated track does not include running if the purpose for running is known
TS	Traveling, swimming	<ul style="list-style-type: none"> used when the specific purpose of swimming is not known if the purpose is known, use a more specific description such as fleeing
TW	Traveling, walking	<ul style="list-style-type: none"> used when the purpose of walking is not known if the purpose is known, use a more specific description such as migrating does not include traveling on a path (see TP)
UR	Urinating	<ul style="list-style-type: none"> urinating

WILDLIFE SIGHTING AND ACTIVITY RESPONSE FORM

Name of recorder: _____ Telephone/Email: _____

Company/Agency: _____ Project: _____

Date: _____ Time: _____ Temp: _____ Weather: _____

Type of vehicle: _____ Photos attached Y / N

Species	No.	Habitat	Activity	Altitude (m)	UTM +/-

Comments: _____

Appendix C: Glossary of Key Terms

Avoid: to keep away from or withdraw from.

Adaptive Management: process for continually improving practices by learning from their outcomes.

Habitat: the air, soil, water, food and cover components of the environment on which wildlife depend directly or indirectly in order to carry out their life processes.

Minimize: to make a planned, stated, and directed effort to reduce to a reasonable minimum.

Mitigate: to make less serious or severe.

Monitor: to evaluate progress toward stated objectives and guide the long term revision, adjustment and refinement of the plan; the systematic measuring, comparing, and evaluation of suitable indicators of change in conditions.

Qualified professional: A person who possesses, in addition to skill, a special registration, or certification, or education which is obtained by an accredited academic institution, and who possesses knowledge which is inherently or legally necessary to render that person capable, competent, and eligible to perform the particular responsibilities.

Security Areas: habitat that is used by wildlife for security, for example to avoid predation.

Sensitive Ecosystems: are either relatively scarce or relatively fragile in a regional context. Relatively scarce ecosystems are limited in distribution and relatively fragile ecosystems are sensitive to physical/non-physical disturbance. Red- and Blue-listed Plant Species and Plant Communities¹² are considered to be sensitive ecosystems.

Red Listed species include any indigenous species or subspecies that have, or are candidates for Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.

Blue Listed species at risk include any indigenous species or subspecies considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events.

Yellow Listed species include any indigenous species or subspecies (taxa) that is not at risk in British Columbia. The CDC tracks some Yellow listed taxa that are vulnerable during times of seasonal concentration (e.g. breeding colonies).

Wildlife: vertebrates that are neither human nor domesticated - includes the eggs and juvenile stages of vertebrates.

References:

- ¹ Dawson Creek LRMP Working Group. 1999. *Dawson Creek Land and Resource Management Plan*. Land Use Coordination Office. http://ilmbwww.gov.bc.ca/slrp/lrmp/fortstjohn/dawson_creek/index.html (October 2, 2008).
- ² Fort Nelson LRMP Working Group. 1997. *Fort Nelson Land and Resource Management Plan*. Land Use Coordination Office. http://ilmbwww.gov.bc.ca/slrp/lrmp/fortstjohn/fort_nelson/index.html# (October 2, 2008).
- ³ Fort St John LRMP Working Group. 1997. *Fort St John Land and Resource Management Plan*. Land Use Coordination Office. http://ilmbwww.gov.bc.ca/slrp/lrmp/fortstjohn/fort_stjohn/index.html (October 2, 2008).
- ⁴ Mackenzie LRMP Working Group. 2000. *Mackenzie Land and Resource Management Plan*. Land Use Coordination Office. <http://ilmbwww.gov.bc.ca/slrp/lrmp/princegeorge/mackenzie/index.html> (October 2, 2008).
- ⁵ Province of British Columbia. 2002. *Forest and Range Practices Act*. SBC2002, c.69. Queen's Printer, Victoria, British Columbia. http://www.qp.gov.bc.ca/statreg/stat/F/02069_01.htm (February 20, 2004).
- ⁶ AXYS Environmental Consulting Ltd. 2003. *A Cumulative Effects Assessment and Management Framework (CEAMF) for Northeast British Columbia*. Prepared for the BC Oil and Gas Commission and the Muskwa-Kechika Advisory Board. M-K-2001-2002-54.
- ⁷ Pepper, C.B., M.A. Nascarella, and R.J. Kendall. 2003. *A Review of the Effects of Aircraft Noise on Wildlife and Humans, Current Control Mechanisms, and the Need for Further Study*. *Environmental Management* 32(4):418-432.
- ⁸ Cote, S.D. 1996. *Mountain Goat Responses to Helicopter Disturbances*. *Wildlife Society Bulletin*, 24:681-685.
- ⁹ BC Ministry of Environment - Wildlife Branch. 2006. *Wildlife Guidelines for Backcountry Tourism/Commercial Recreation in British Columbia*. http://www.env.gov.bc.ca/wld/twg/documents/wildlife_guidelines_recreation_may06_v2.pdf (October 2, 2008).
- ¹⁰ BC Ministry of Environment – Peace Region Ecosystems Section. 2008. *Peace Region Guidelines for Aircraft Operations/ Wildlife Interactions*. ftp://ftpprg.env.gov.bc.ca/pub/outgoing/Peace_Region_Wildlife_Values/Industrial_Sectors/Best_Management_Practices/AircraftBMPJul%2015'08.pdf (October 2, 2008).

- ¹¹ Province of British Columbia. 1996. *Water Act*. R.S.BC (1996), c. 483.
http://www.qp.gov.bc.ca/statreg/stat/W/96483_01.htm (December 21, 2005).
- ¹² Resources Information Standards Committee. British Columbia Ministry of Sustainable Resource Management. (formerly Resources Inventory Branch). 2001. *Tracking Lists*. British Columbia Ministry of Environment, Lands and Parks, Resources Inventory Branch.
<http://srmwww.gov.bc.ca/cdc/tracking.htm> (January 21, 2003).