Annex VI

Access Roads and Connection Line Summary

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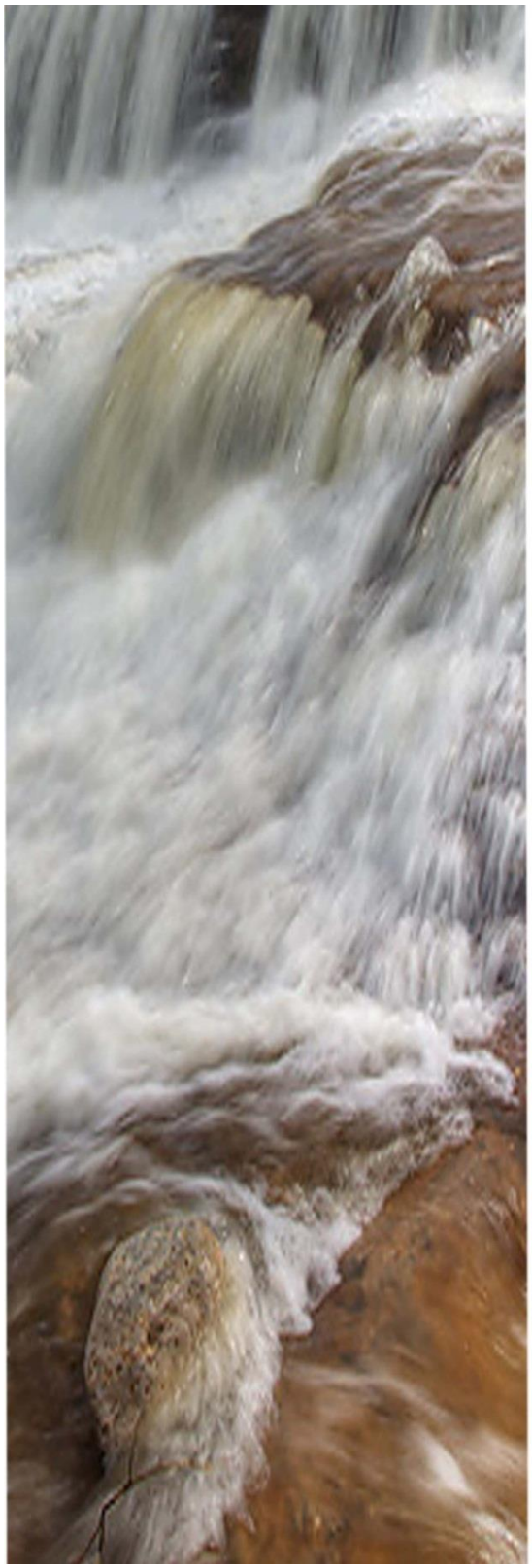

Power Line and Access Road Summary for the Blanche River Hydroelectric Project

A Summary Report for:

Xeneca Power Development Inc.

Original report - based on analysis up to March 3, 2011

November 29, 2013

KBM RESOURCES GROUP

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Introduction

KBM Resources Group was retained by Xeneca Power Development Inc. (Xeneca) to undertake a route investigation, verification and analysis of proposed power line and access road routes for 18 proposed hydroelectric projects. The 18 proposed Xeneca projects have been awarded conditional approval by the Ontario Power Authority under the Feed in Tariff (FIT) program. For each project, the site of the generator, point of common coupling (PCC) and point of connection (PC) are identified in the conditionally approved FIT application. Based on these approved points of connection, this exercise was undertaken to refine power line routes for each project. KBM was later asked to include discussion of considerations as the power line and road access routes evolved over time to the present preferred option.

The Blanche River hydroelectric project consists of a proposed 2.1 MW generator on the Blanche River approximately 21 km north of the Town of Englehart.

This report is a project-specific report that describes the process used to refine power line routes and road access routes for the Blanche River project. The report includes documentation of inputs to route iterations, analyses that were conducted, input that was gathered, and assessments that were carried out. The report is comprised of a detailed description of the methodology used to locate and assess the power line and road options, and ultimately choose a preferred option that has the least amount of impact.

Assessment Framework for Power Lines and Roads:

This report provides details of the assessment work that was carried out for power lines and new access roads. The assessment work has been combined into one report due to the similarities in the work conducted on each of these types of corridors. There is a significant difference, however, in the legislative framework used to evaluate each type of corridor.

Power lines rated less than 115 kV are not subject to the Waterpower Class EA or to MNR Class EAs. Instead, any potential impacts of lines will be examined by MNR as part of the land disposition process using a decision-making framework that is summarized below. As such, the information on power lines provided in this report is for information purposes only and should not be considered within the scope of the EA.

New access roads that are constructed as part of waterpower projects are covered within the scope of the Class EA for Waterpower Projects. The access road information provided in this report should therefore be considered a component of the Class EA for the project.

MNR's Decision Making Framework:
The following are the steps that the MNR will be carrying out as part of the decision making process prior to disposition of land for the proposed power lines. Results of the work referenced in this report are intended to help support MNR's decisions.

1. Screening Process
    a. Prepare the project description
    b. Apply screening criteria
        i. Include mitigation measure

        ii. Assign high, medium and low effects in the screening process
    c. Determine the disposition's potential environmental effects (nil/low or moderate/high)
2. Projects with moderate to high potential net environmental effects also require:
    a. Public notice
    b. Project evaluation (technical aspects)
3. Mitigation
4. Monitoring of project

Methodology: Detailed Line Location and Assessment

KBM was provided with preliminary power line routings developed by Xeneca staff and mapped by Natural Resource Solutions Inc. in 2010. These preliminary routes were created based on data found on publicly available mapping websites such as Google maps, Google Earth and Land Information Ontario (LIO) data sets (water, roads, streams, etc). Detailed information about values and land tenure affected by the proposed power lines was not available during this phase, but was subsequently collected and used to inform final locations.

KBM extended the scope of the 2010 review to further optimize the routes by maximizing the use of existing resources (roads), minimizing the number of water crossings, and avoiding wetlands where possible.

Draft Report on Proposed Power Lines and Access Roads:

Further review of the attributes of the proposed route was undertaken by KBM. KBM began assembling a database of pertinent values information and land tenure designations for the proposed power line routes. The proposed line locations were then overlaid with assembled values layers, and a summary of the potentially impacted values was compiled. The analysis focused on impacted values within proximity of 2km of the proposed power line which included moose calving sites, aquatic resource areas, fish spawning zones, natural heritage areas and bird nesting sites. Data layers used for this exercise included:

- Land Information Ontario dataset
- Natural Resources Canada (NRCan) Topographic data
- 2008 Forest Resource Inventory data
- Medium resolution SPOT panchromatic orthoimagery from Natural Resources Canada
- Natural Resources Values Information System (NRVIS) Data Layers (circa Feb 2011)

A linear breakdown of proposed lines following existing roads, new access roads and new line corridors was also compiled and summarized. Minor amendments were made to the proposed routes by aligning them with existing roads and by avoiding water crossings and other sensitive areas to minimize potential impacts to the environment.

At this time, where appropriate, additional line route options were proposed. These were presented and explained in the draft report as alternatives with a primary goal of following existing roads and reducing impact to sensitive areas and identified values.

A draft report summarizing the above desktop exercise was completed in March, 2011. This report was distributed by Xeneca/KBM to all of the involved government agencies with the primary purpose of soliciting feedback on the identified (and quantified) proposed lines to determine if sensitive values were missed during the preliminary analysis.

Revised Power Line and Access Road Report:

Following submission of the draft report in March, 2011, a high resolution leaf-off aerial photography program was undertaken for all route options. This resulted in 20 cm resolution, digital, true color ortho-photography to aid in habitat characterization and the identification of important environmental values.

Ground-truthing of the proposed power line and road access routes was completed subsequent to the post processing of digital aerial photography in June 2011. Existing roads and water crossings were assessed to determine their current condition, structural integrity and upgrade requirements, including:

- Current condition and classification (Primary, Secondary & Tertiary) of existing forestry access roads.
- Current condition of existing water crossing structures and drainage culverts.
- Requirements for upgrade; Water crossing structures, road surface, road base, drainage culverts & ditching, road slope reduction.
- General classification of pre-existing road base and aggregate quality and quantity.
- Location of existing aggregate pits in proximity to the project site.

Further revised reports for power line and access routes were completed in November, 2011 for inclusion in the draft EA for each site. Power line and road access routes presented in the revised reports were designed to:

- avoid impacts on known values;
- reduce environmental impact (i.e. streams & wetland crossings);
- minimize landscape footprint and fragmentation;
- dovetail with existing road corridors; and
- reduce total line length.

Road access strategies for all sites focused on the use of existing SFL roads and trails for the majority of project access. Where required, small sections of new road were adjusted to avoid impacts, and were located using high resolution imagery and best available data, including current FMP information. Road routes were reviewed during the ground-truthing exercise in June and July, 2011.

Rapid Assessment (RAT) of potential Provincially Significant Wetlands (PSW):*

Where power line or new road corridors could impact adjacent wetlands, a Rapid Assessment Technique was used to determine if the wetland is likely to be scored as a Provincially Significant Wetland (PSW).

Northern Bioscience completed this modeling exercise based on methods outlined in NEST Technical Report TR-025, Wetlands Evaluation in Ontario: Models for Predicting Wetland Score (OMNR, 1995).

Where potential PSWs were identified in proximity to a route, the corridor was realigned to avoid the feature, or mitigation strategies were proposed to remove impacts. For more detailed results, please see Northern Bioscience's Wetlands Rapid Assessment report in Annex VI.

Coarse Filter Assessment – to Avoid Known District-Specific Values

Prior to detailed assessments for significant wildlife habitat, in the fall of 2012, Xeneca provided the MNR with maps of the most recent preferred new power line and access road options, buffered to a 100m corridor width. The MNR then assessed the proposed road and line locations to identify any conflicts with existing district-specific values including:

- Moose Emphasis Areas
- Marten Core Areas (from Forest Management Plans)
- Quality Fishing Zones
- Moose Wintering Habitat
- Significant wetlands
- Species at Risk (SAR) observations
- Natural Lake Trout Lakes
- Tourism values (including remote operations)
- Locally known sensitive cultural heritage or archaeological values
- Current or historic landfill or waste disposal sites
- Any known natural hazard areas or other liabilities
- Any areas that are subject to land claim negotiations or other known Aboriginal interests
- Any areas subject to pending dispositions (aggregate permits, forestry roads, etc.)
- Areas covered by mining tenure under the Mining Act.
- Land use policy areas that restrict or influence such development (e.g. parks and conservation reserves)
- Private land
- Federal land
- Existing Crown tenure (leases, land use permits (LUPs), easements)
- Aggregate license areas, including "greenfield" sites under a first right of refusal (Minstry of Transportation (MTO)
- Trap cabins
- Existing utility lines and communications towers
- OFSC snowmobile trail network

Results of this analysis can be found in the results section below.

Identified conflicts were then assessed by Xeneca and roads and lines were either re-located accordingly to avoid known values and/or mitigation measures were identified and documented to ensure minimal impact. At this point, final preferred routes were chosen and subjected to a fine-filter assessment to predict the presence of significant wildlife habitat.

Ecological Land Classification (ELC) Interpretation from High Resolution Aerial Imagery

ELC was conducted for use in the subsequent fine filter analysis. All of the interpretation work discussed below was completed by an Ontario MNR-certified interpreter.

ELC classification was conducted on a 600m wide corridor around the centre line of all proposed power lines and new road access route options. Shapefiles for areas of interest (project areas) were created by KBM's GIS support group, and provided to the interpreter. The interpreter obtained and reviewed background inventory data for the project areas, including the current MNR Forest Resource Inventory (FRI) dataset as obtained through MNR's information portal.

Using one of KBMs softcopy systems, the interpreter delineated a polygon for each unique forested and non-forested type encountered in the project areas. Ontario's Forest Information Manual (FIM) specifications regarding minimum polygon sizes were followed. The polygon layer was checked for topology errors and revised as necessary.

Each of the polygons was then assigned attributes by the interpreter. MNRs eFRI data entry tool was used to enter the attributes including tree species, tree average age, tree average height, ecosite, etc. Ontario's harmonized ecosystem classification system was used.

The MNR's error-checking validation tool was run on completed sections and revisions were made as necessary. The resulting ELC were used as a component of the fine-filter habitat assessment. Detailed ELC results are presented in the results section.

Fine Filter – to Predict Significant Habitats

The objective of the fine filter exercise was to determine areas upon which to focus field surveys for species at risk, provincially tracked species and significant wildlife habitat along Xeneca's proposed power corridors and access roads. In August, 2012, the methodology was presented to MNR to garner support for the proposed approach. MNR proposed some updates to the approach, and the approach was adapted accordingly to accommodate two opportunities for MNR district level review of the results/progress.

The exercise began by working with MNR and Northern Bioscience to compile a preliminary list of species of interest for each proposed corridor. In so doing, the following data sources were used:

- Atlas of the Breeding Birds of Ontario: www.birdsontario.org
- Natural Heritage Information Centre: nhic.mnr.gov.ca/MNR.nhic/nhic.cfm
- Royal Ontario Museum-MNR: www.rom.on.ca/ontario/risk.php
- NatureServe: www.natureserve.org
- OMNR Significant Wildlife Habitat Technical Guide-Appendix G
- Ontario Species at Risk: www.mnr.gov.on/en/Business/Species/index.html
- Oldham, M .J. and S.R. Brinker. 2009. Rare Vascular Plants of Ontario. Fourth Edition. Natural Heritage Information Centre. Ontario Ministry of Natural Resources, Peterborough, Ontario. 188 pp.

The preliminary species lists were then provided to MNR district staff for review and input. Final species lists were created and formed the basis for the remainder of the exercise (see Appendix A).

KBM and Northern Bioscience then worked together to identify characteristics of the habitat for each species that could be used to assess the presence of each type of habitat along the length of the proposed corridors. The habitat characteristic identification was carried out using a variety of data sources.

To streamline the habitat assessment, key species were then grouped together based on similar habitat requirements. Habitat classifications for generalists and species whose habitat is complex and very specific at the microsite level, were excluded from this analysis. Notable exclusions to the GIS habitat query were the Eastern Massassauga Rattlesnake, Wood Turtle, Blanding's Turtle, and Milksnake. Consultation with District OMNR Species at Risk Biologists will be completed as a more reliable and preferred alternative.

KBM had previously compiled a comprehensive set of GIS data layers for the project, as well as acquiring 20 cm resolution digital true color ortho-photography. Habitat requirements for each group of species were "translated" into ELC ecosite codes and other parameters such as percent canopy closure, tree age, and species composition (see Appendix). Minimum area requirements were noted in the parameters but were not included within the context of the GIS analysis due to the relatively narrow width of the corridor delineated into ecosites (600m), and since adjacent habitat types were unknown.

The translation of habitat requirements into Ecological Land Classification (ELC ecosites) was completed by biologists at KBM and Northern Bioscience, and was based on their interpretation, unless otherwise noted in the sources.

Finally, KBM implemented the methodology by conducting GIS analysis on each of the proposed lines and new access roads to identify the likelihood of significant wildlife habitat along each corridor for each set of parameters. Results of the analysis were presented to MNR for review and to seek concurrence on the identification of priority sites for field verification in the spring of 2013. These results can be viewed in the results section below. In addition, the results of field assessments have been summarized by Northern Bioscience in separate habitat reports contained in Annex VI.

Species at Risk (SAR):

Where a contravention of the Endangered Species Act (ESA) is identified and confirmed, Xeneca may require overall benefit permits in order to proceed with new access road and power line construction. MNR has committed to reviewing proposed new power lines and access roads to determine the risks of contravening the ESA. MNR can then provide guidance as to what surveys may be required in what areas to support permitting. It is anticipated that many impacts can be avoided by implementing timing restrictions to ensure work avoids sensitive times for species. In other cases, a minor or major road/line re-routing would be needed.

Results – MNR "Coarse Filter" Analysis for Proposed Roads and Lines

The following summarizes comments received from MNR as a result of the coarse filter analysis:

- Natural heritage concerns around Bobolink habitat (SAR – THR, with habitat protection)
- The outlined area overlaps Cultural Heritage Potential sites along the Blanche River

Much of the outlined area falls on private land.

Results – Final Routes for "Fine Filter" Analysis

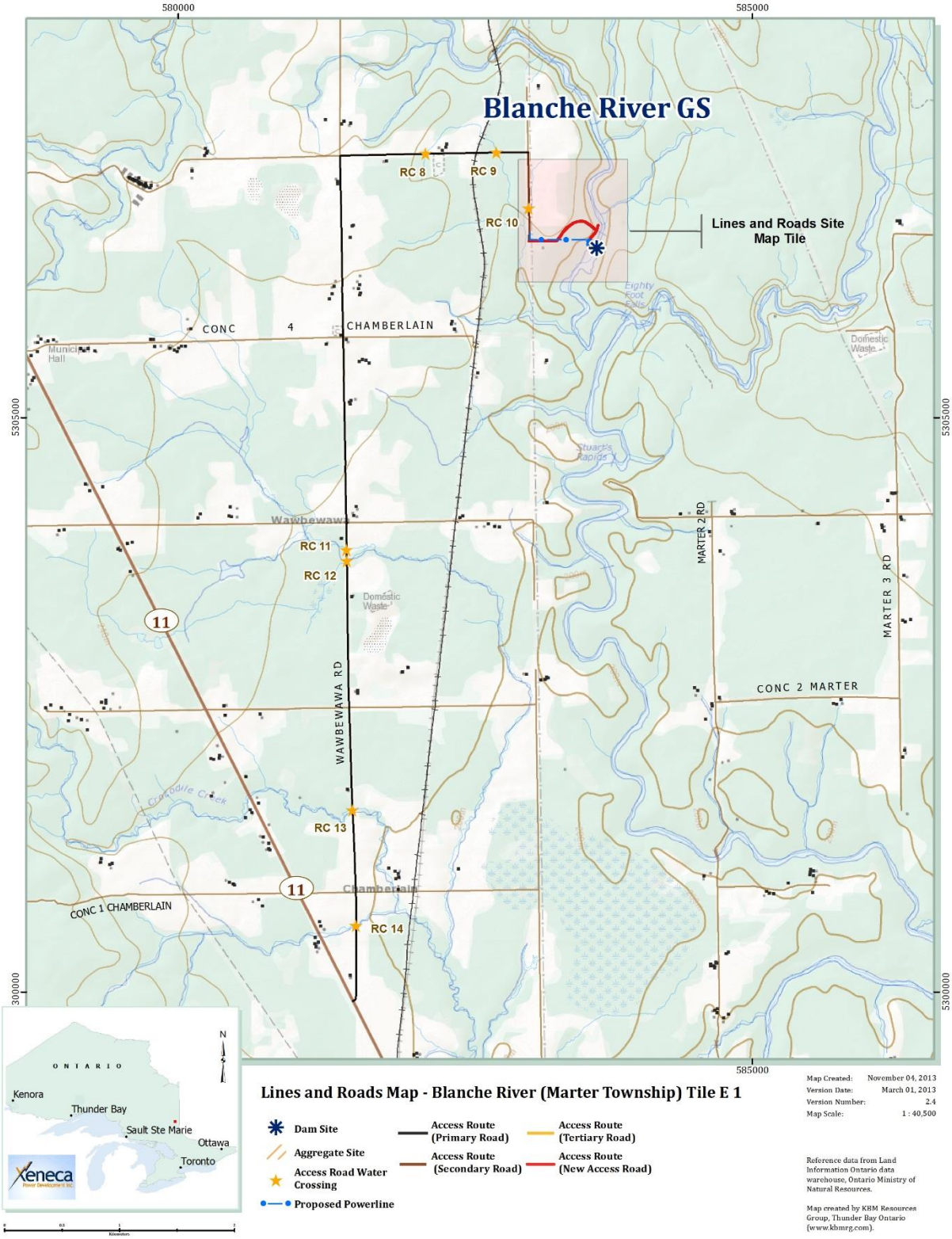

Figure 1. Blanche river site map.

Description of Proposed Power Line Route:

The proposed power line from the Point of Common Coupling (PCC) to the Point of Connection (PC) travels south and west with a total line distance of 673 metres (See Figure 2 and Table 1). 637 metres of the power line is located on patent land with the final 36 meters being located on Crown land. No known water crossings or wetlands are impacted by the proposed power line.

Table 1 - Power line route summary statistics for Blanche River.

Owner Type	Road Type	Summary Statistics					
		Length (m)	Water Crossing			Wetlands	
			Highway	Existing	New	Edge	Crossing
Private	New Corridor	637	-	-	-	-	-
Crown	New Corridor	36	-	-	-	-	-

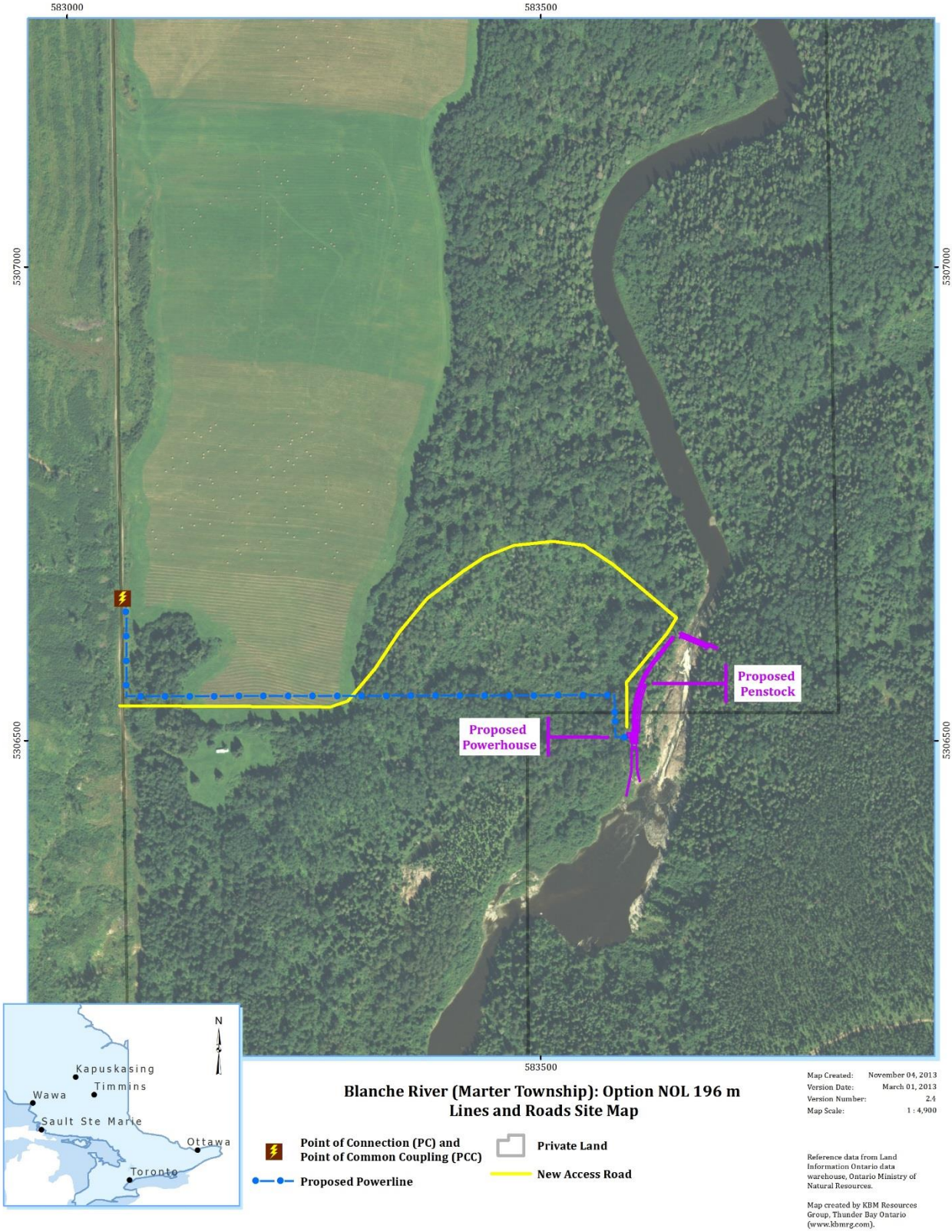

Figure 2 - Proposed power line and access routes for the Blanche River project Option NOL 196m.

Description of Proposed Access Route

Access to the site will be constructed using existing access roads and trails as much as possible with a minimum amount of new construction. The headworks area of the project site is currently accessible by a combination of existing access road and ATV trail. The site would be accessed by driving approximately 3 km north west of Englehart on Hwy 11, followed by approximately 7.5 km north on Wawbewawa Road, followed by approximately 2 km east on Aidie Creek Garden Road, followed by approximately 1 km south on E Road as per the statistics below (Table 2).

There are currently two options provided in terms of dam location. The NOL 196 option (Figure 2) has the dam in a more southerly location. This option results in a total road length of 10.66 km. The second option, NOL 201 (Figure 3) has a total road length of 10.61 km.

Table 2. Road access summary statistics for Blanche River.

			Length (m)	Water Crossing			Wetlands	
Option	**Owner Type**	**Road Type**		**Highway**	**Existing**	**New**	**Edge**	**Crossing**
NOL 196		Primary	8,989	-	-	-	-	-
		Secondary	774	-	-	-	-	-
	Crown	New Access Road	15					
	Private	New Access Road	837					
		Total	**10,614**					
NOL 201		Primary	8,989	-	-	-	-	-
		Secondary	774					
	Crown	New Access Road	15					
	Private	New Access Road	884	-	-	-	-	-
		Total	**10,661**					

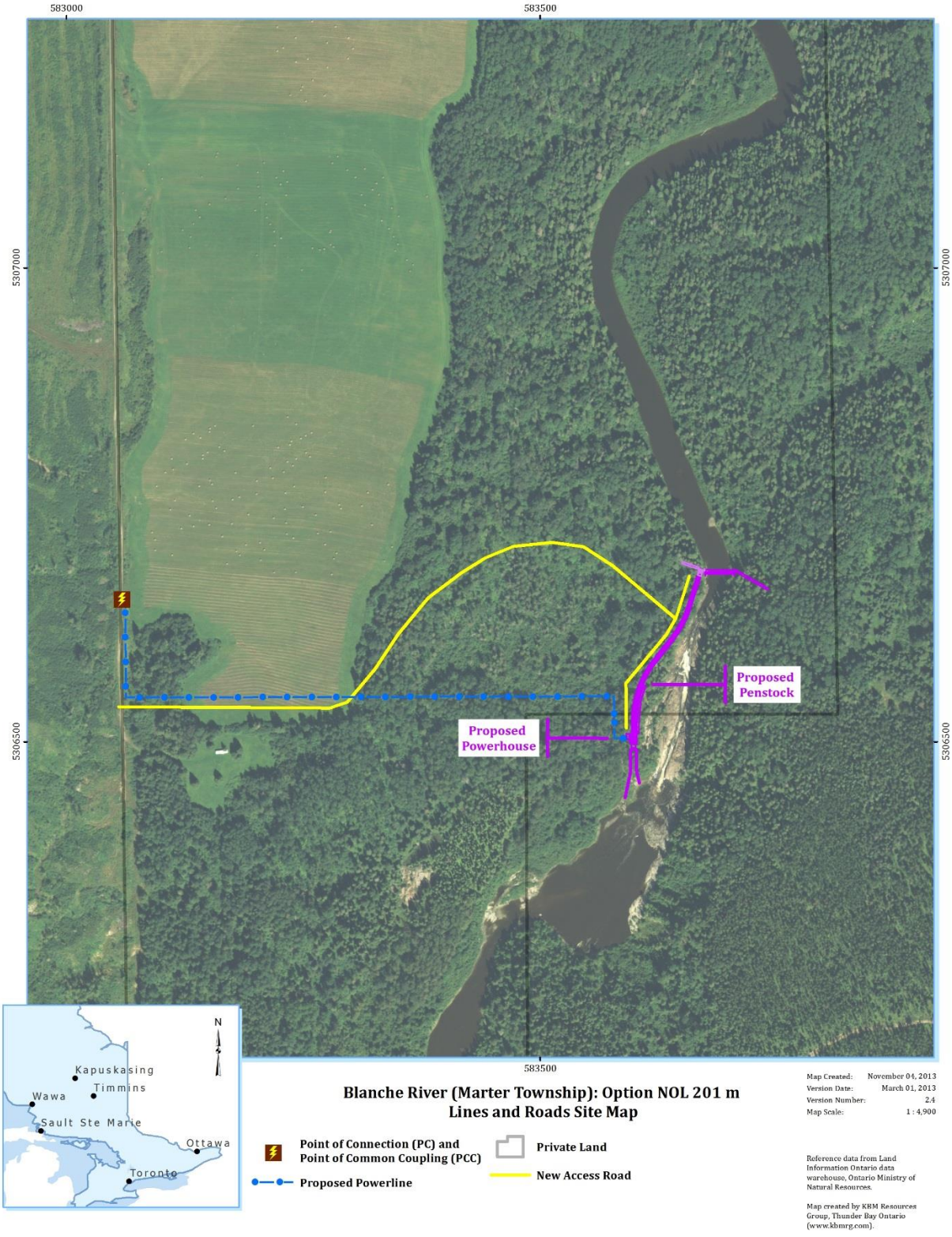

Figure 3. Proposed power line and access routes for the Blanche River project Option NOL 201m.

Results – Rapid Assessment (RAT*) of Potential Provincially Significant Wetlands

The results of the RAT assessment can be viewed as a separate report in Annex VI.

Results – Ecological Land Classification

The results of the Ecological Land Classification for a 600m wide corridor on power line and new road access options are summarized in the tables below. The first set of tables summarizes the area and percentage by polytype for each of:

- power line corridor option
- merged power line and road access corridor options
- new road access corridors

The second set of tables summarizes area and percentage by primary and secondary ecosite group and label for each of the three types of corridor listed above. In the case of secondary ecosites, it is important to note that the area totals do not reflect the total area of the secondary ecosite. Instead, they reflect the total area of the primary ecosite polygons for which the secondary ecosite forms an unknown portion.

ELC Results by Polytype

Table 3. Ecological land classification of proposed power line – by polytype.

Polytype	Area (ha)	%
Developed Agricultural Land	9.94	15.06
Forested	49.71	75.29
Unclassified	2.08	3.14
Water	4.29	6.50

Table 4. Ecological land classification of combined power line and new road access corridors – by polytype.

Polytype	Area (ha)	%
Developed Agricultural Land	11.88	15.04
Forested	60.15	76.15
Unclassified	2.09	2.65
Water	4.86	6.16

Table 5. Ecological land classification of proposed new road access corridors – by polytype.

Polytype	Area (ha)	%
Developed Agricultural Land	10.67	14.42
Forested	56.63	76.57
Unclassified	1.88	2.54
Water	4.78	6.46

ELC Results by Ecosite Group and Label

Table 6. Ecological land classification of proposed power line – by ecosite group and label.

Ecosite Group	Ecosite Label	Area (ha)	%
Anthropogenic Ecosites	998) Utilities Unclassified	1.15	1.75
Anthropogenic Ecosites	999) Residential Unclassified	0.92	1.40
Dry to Fresh Silty to Fine Loamy Ecosites	101) Fresh or Silty to Fine Loamy: Spruce - Fir Conifer	7.39	11.19
Dry to Fresh Silty to Fine Loamy Ecosites	104) Fresh or Silty to Fine Loamy: Aspen - Birch Hardwood	30.36	45.98
Dry to Fresh Silty to Fine Loamy Ecosites	93) Fresh or Silty to Fine Loamy: Field	9.94	15.06
Dry to Fresh Silty to Fine Loamy Ecosites	98) Fresh or Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	4.51	6.83
Moist or Silty to Fine Loamy to Clayey Ecosites	114) Moist or Fine: Pine - Black Spruce Conifer	7.45	11.29
Water	0) Water	4.29	6.50

Table 7. Ecological land classification of proposed power line and new road access – by ecosite group and label.

Ecosite Group	Ecosite Label	Area (ha)	%
Anthropogenic Ecosites	998) Utilities Unclassified	1.17	1.48
Anthropogenic Ecosites	999) Residential Unclassified	0.92	1.17
Dry to Fresh Silty to Fine Loamy Ecosites	101) Fresh or Silty to Fine Loamy: Spruce - Fir Conifer	13.68	17.32
Dry to Fresh Silty to Fine Loamy Ecosites	104) Fresh or Silty to Fine Loamy: Aspen - Birch Hardwood	33.75	42.73
Dry to Fresh Silty to Fine Loamy Ecosites	93) Fresh or Silty to Fine Loamy: Field	11.88	15.04
Dry to Fresh Silty to Fine Loamy Ecosites	98) Fresh or Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	5.18	6.56
Moist or Silty to Fine Loamy to Clayey Ecosites	114) Moist or Fine: Pine - Black Spruce Conifer	7.53	9.53
Water	0) Water	4.86	6.16

Table 8. Ecological land classification of proposed new road access – by ecosite group and label.

Ecosite Group	Ecosite Label	Area (ha)	%
Anthropogenic Ecosites	998) Utilities Unclassified	0.96	1.29
Anthropogenic Ecosites	999) Residential Unclassified	0.92	1.25
Dry to Fresh Silty to Fine Loamy Ecosites	101) Fresh or Silty to Fine Loamy: Spruce - Fir Conifer	13.40	18.12
Dry to Fresh Silty to Fine Loamy Ecosites	104) Fresh or Silty to Fine Loamy: Aspen - Birch Hardwood	30.71	41.53
Dry to Fresh Silty to Fine Loamy Ecosites	93) Fresh or Silty to Fine Loamy: Field	10.67	14.42
Dry to Fresh Silty to Fine Loamy Ecosites	98) Fresh or Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	5.01	6.77
Moist or Silty to Fine Loamy to Clayey Ecosites	114) Moist or Fine: Pine - Black Spruce Conifer	7.51	10.15
Water	0) Water	4.78	6.46

Results – "Fine Filter" Habitat Assessment

Please note that the following area values for potentially significant habitat include polygon areas for which the primary ecosite has been deemed to be potential habitat, as well as polygons for which the secondary ecosite has been deemed to be potential habitat. A secondary ecosite by definition is: "A complex of two forested ecosites is allowed to be recorded when more than one ecosite is present as long as the secondary ecosite represents at least 20% of the area of the polygon and the area associated with the secondary ecosite does not exist in a manner suitable for meeting the minimum polygon size for creating a new polygon." (OMNR 2009[1]). As such, it is likely that total areas (ha) of potential wildlife habitat have been slightly over-estimated.

Table 9. Area of significant habitat by species for proposed power line.

Species	Habitat	Area (ha)
Eastern Meadowlark	Hayfields and Pastures	9.94
Bobolink	Hayfields and Pastures	9.94
Common Nighthawk	Open Rock Outcrops	9.94
Whip-poor-will	Open Rock Outcrops	1.15
Black Tern	Open wetland primarily marsh	9.94
Short-Eared Owl	Open wetland primarily marsh	9.94
Chimney Swift	Birds Associated with Buildings	0.92
Barn Swallow	Birds Associated with Buildings	0.92
Snapping Turtle nesting	Turtle Habitat (Nesting)	66.02

[1] Ontario Ministry of Natural Resources. 2009. Forest Resources Inventory Technical Specifications 2009. Queens' Printer.

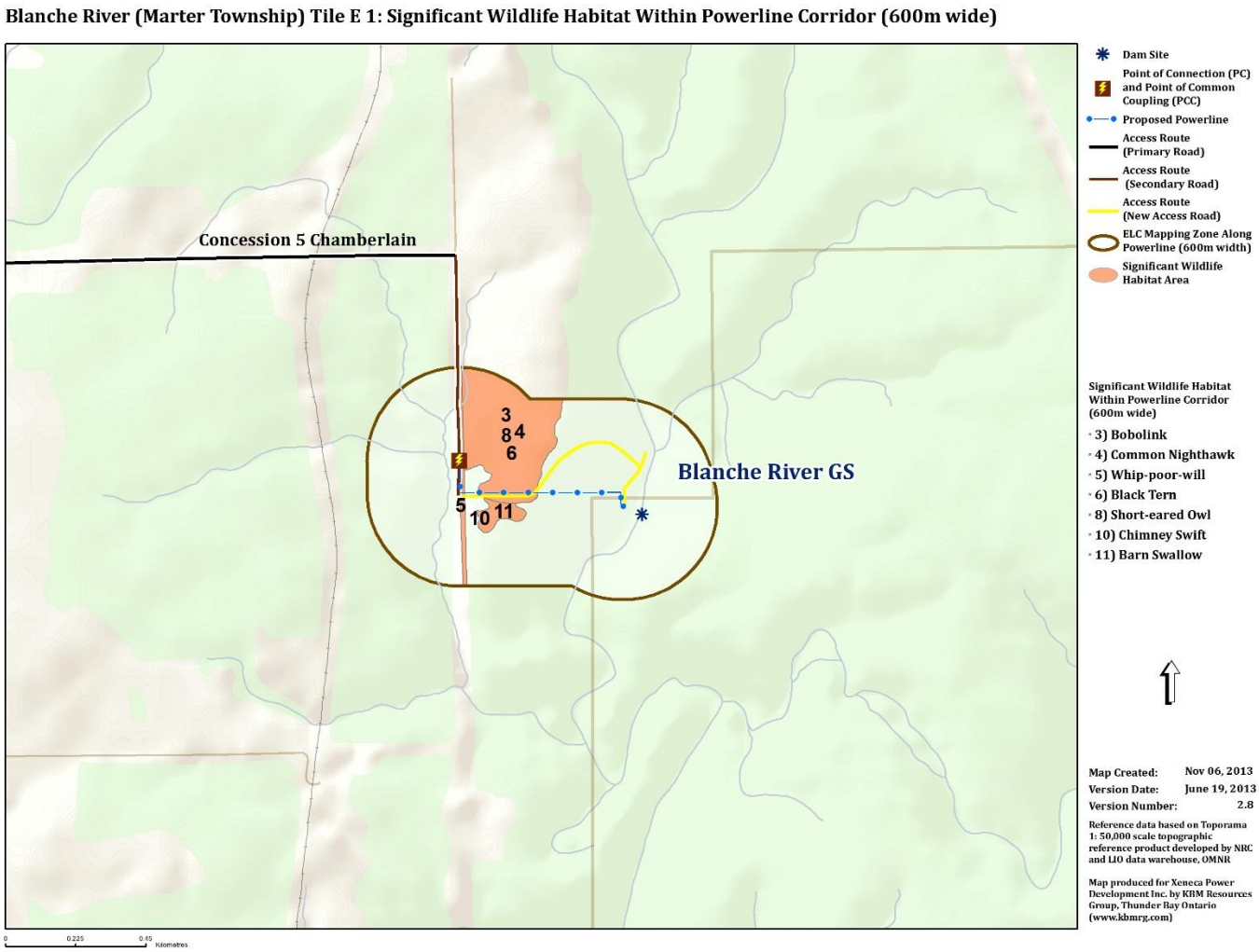

Figure 4. Possible significant wildlife habitat within power line corridor (600m).

Table 10. Area of significant habitat by species for proposed new road corridor.

Species	Habitat	Area (ha)
Eastern Meadowlark	Hayfields and Pastures	10.67
Bobolink	Hayfields and Pastures	10.67
Common Nighthawk	Open Rock Outcrops	10.67
Whip-poor-will	Open Rock Outcrops	0.96
Black Tern	Open wetland primarily marsh	10.67
Short-Eared Owl	Open wetland primarily marsh	10.67
Chimney Swift	Birds Associated with Buildings	0.92
Barn Swallow	Birds Associated with Buildings	0.92
Snapping Turtle nesting	Turtle Habitat (Nesting)	73.96

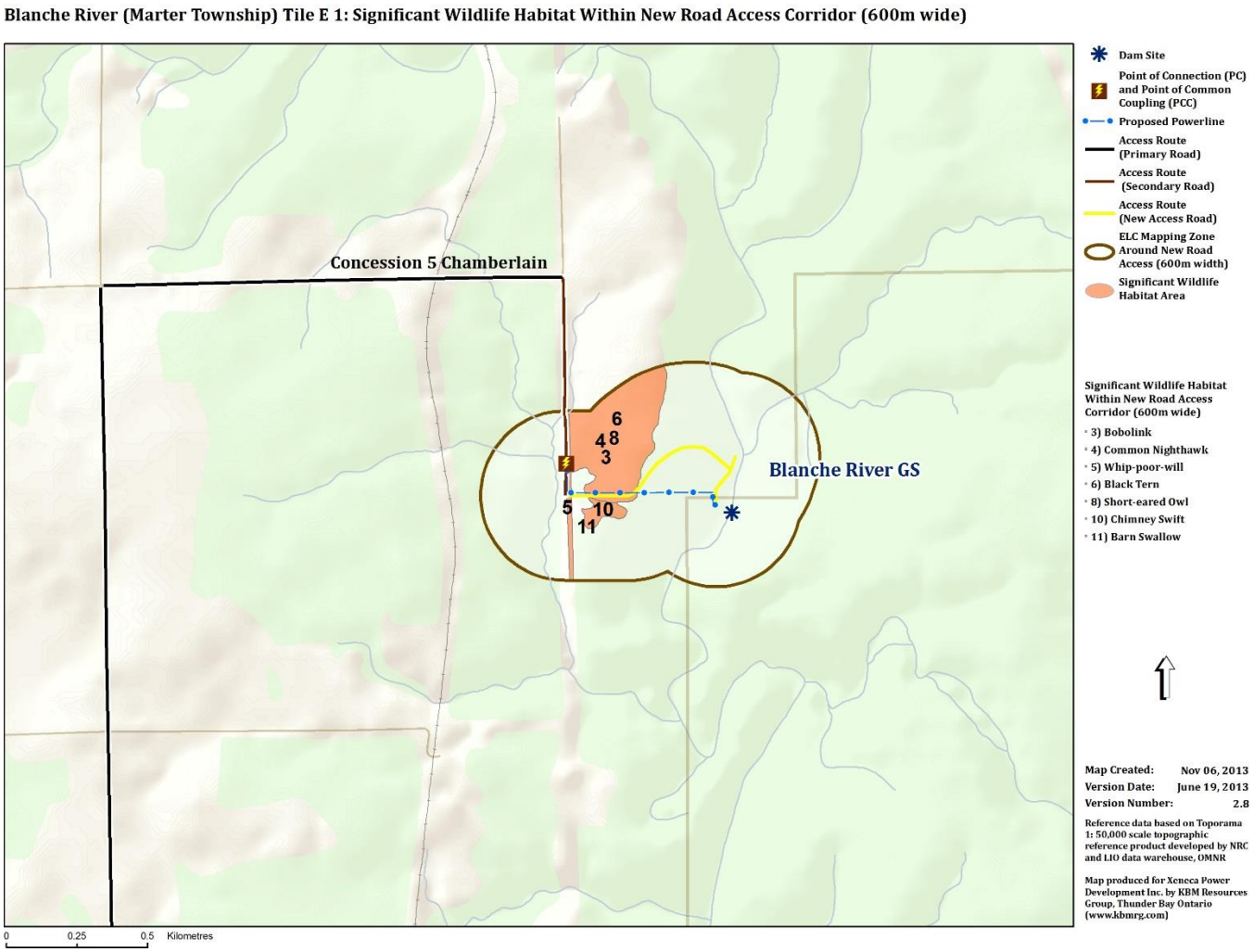

Figure 5. Possible significant wildlife habitat within proposed new road corridor (600m).

Appendix A – Parameters used for fine-filter habitat assessment analysis (GIS query-based), followed by rationale for inclusion of species, and survey techniques

Ecoregion	Common Name	Latin Name	OMNR status or S-rank	Habitat Characteristics/Requirements	Wetlands e.g Marshes, Swamps	Open Water (Lakes, ponds, rivers, streams)	Riparian -Shores or nearshore areas	Grasslands	Parklands, Suburban areas	Thickets, Second growth	Old growth, mature stands	Forest edges	Downed woody debris	Seeps	Cliffs, Talus slopes, ravines	Colonial (birs)/ Seasonally concentrated (all other taxa)	Cavity user	Provincially Rare	Area Sensitive	Sources	Corresponding Ecosite Descriptor
3E,5E,6E	American Marten	*Martes americana*	MNR "featured species"	continuous tracts of mature coniferous or conifer dominated mixed wood forests; cedar swamps; mainly terrestrial in winter and more arboreal in summer; home range is larger for males (2.0-15.0 km2) than females (0.8-8.4 km2); maternal dens in cavities of trees >40 cm dbh; also require large snags as summer resting sites; winter den and resting sites under snow cover in large logs, stumps or snags	X		X			X	X	X	X				X		X	SWHTG (2000) Appendix G	
3E,5E,6E	Bald Eagle	*Haliaeetus leucocephalus*	Special Concern	require large continuous area of deciduous or mixed woods around large lakes, rivers; require area of 255 ha for nesting, shelter, feeding, roosting; prefer open woods with 30 to 50% canopy cover; nest in tall trees 50 to 200 m from shore; require tall, dead, partially dead trees within 400 m of nest for perching; sensitive to toxic chemicals		X					X	X						X	X	SWHTG (2000) Appendix G	
3E,5E,6E	Bank Swallow	*Riparia riparia*	Colonial Nesting Bird	sand, clay or gravel river banks or steep riverbank cliffs;lakeshore bluffs or easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are cose to water;nesting sites are limiting factor for species presenece		X	X								X	X	X			SWHTG (2000) Appendix G	May be found in, but not limited to: B001-004, B157-159, B173-175
3E,5E,6E	Black Tern	*Chilidonias niger*	Special Concern	wetlands, coastal or inland marshes; large cattail marshes, marshy edges of rivers, lakes or ponds, wet open fens, wet meadows; returns to same area to nest each year in loose colonies; must have shallow (0.5 to 1 m deep) water and areas of open water near nests; requires marshes >20 ha in size; feeds over adjacent grasslands for insects; also feeds on fish, crayfish and frogs	X	X	X	X								X		X	X	SWHTG (2000) Appendix G	
3E	Boneparte's Gull	*Larus philadelphia*	Colonial Nesting Bird	nests in coniferous trees (preferably spruce-fir) near muskegs, swamps, ponds or lakes; frequent lakes, rivers, marshes, coastal bays, harbours; sand bars and mud flats; feeds on fish or scavenges	X	X					X					X				SWHTG (2000) Appendix G	
3E,5E,6E	Canada Warbler	*Wilsonia canadensis*	Special Concern	an interior forest species; dense, mixed coniferous, deciduous forests with closed canopy, wet bottomlands of cedar or alder; shrubby undergrowth in cool moist mature woodlands; riparian habitat; usually requires at least 30 ha	x						x		x						x	SWHTG (2000) Appendix G	
3E,5E,6E	Common Nighthawk	*Chordeiles minor*	Special Concern	open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs				x	x	x		x								SWHTG (2000) Appendix G	
3E,5E,6E	Cougar	*Puma concolor*	Endangered	undisturbed, mixed, coniferous forests; rough, hilly country; swampy land	X					X	X	X						X		SWHTG (2000) Appendix G	
3E	Eastern Meadolark	Sturnella magna	Threatened	open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size				x											x	SWHTG (2000) Appendix G	
3E,5E,6E	Eastern Wolf	*Canis lupus lycaon*	Special Concern	heavily forested areas; home range 300km^2 , makes food caches.	X		X			X	X	X	X				X			SWHTG (2000) Appendix G (used Gray wolf)	
3E	Eskimo Curlew	*Numenius borealis*	Endangered	During fall migration, a wide variety of inland and coastal habitats may be used, including ericaceous heathland with Crowberries (Empetrum nigrum), meadows, pastures, old fields, intertidal mudflats, salt marshes and sand dunes. On spring migration, they were found in tallgrass and eastern mixed grass prairies, often in areas that had been recently burned or disturbed by grazing bison, and in cultivated fields.	X		X	X												COSEWIC. 2009. COSEWIC assessment and status report on the Eskimo Curlew Numenius borealis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. (www.sararegistry.gc.ca/status/status_e.cfm).	
3E	Golden Eagle	*Aquila chrysoptera*	Special Concern	wild, arid plateaus, deeply cut by streams and canyons or sparsely treed slopes and rock crags		X									X			X		SWHTG (2000) Appendix G	
3E,5E,6E	Great Blue Heron	*Ardea herodias*	Colonial Nesting Bird	wetlands, shores of ponds and lakes, marshes, standing trees in open water, swamps, including woodlots; require tall trees for nesting	x		x					x				x				SWHTG (2000) Appendix G	
3E	Great Gray Owl	*Strix nebulosa*	Uncommon Stick-nesting R	boreal forest; various woodlands; open fields or peatlands with exposed perches for hunting; extensive muskegs with interspersed tamaracks and black spruce; open fens, bogs or meadows; diurnal habits; uses abandoned crow, raven, hawk nests; home range of 100 ha or more	X						X	X						X	X	SWHTG (2000) Appendix G	
3E,5E,6E	Little Brown Myotis	*Myotis lucifugus*	recently designated Endang	uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges	x	x	x		x	x	x	x				x	x			SWHTG (2000) Appendix G	
3E,5E,6E	Loggerhead Shrike	*Lanius ludovicianus*	Endangered	grazed pasture, marginal farmland with scattered hawthorn shrubs, hedgerows; fence posts, wires and associated low-lying wetland; located on core areas of limestone plain adjacent to Canadian Shield; greatest threat is fragmentation of suitable habitat due to natural succession; probably needs at least 25 ha of suitable habitat				X										X	X	SWHTG (2000) Appendix G	
5E,6E	Moose	*Alces alces*	MNR "featured species"	Boreal Forest and Great Lakes-St. Lawrence regions; requires some semi-open spaces and swamps or other wetlands for cover and aquatic plants for food; feeding areas with specific aquatic plant species are used; travel corridors to these sites are important; naturally occurring mineral licks are important in spring and early summer; in summer, wetlands preferred; in winter drier forests used; cut-overs and burns particularly important; concentrate in larger numbers at specific sites in winter, during calving and at mineral licks	x	x	x			x	x	x		x		x			x	SWHTG (2000) Appendix G	
5E,6E	Northern Brook Lamprey	*Ichythyomyzon fossor*	Special Concern	Freshwater streams and rivers draining into Lake Superior, Huron and Erie, Nipissing, Ottawa and St. Lawrence Rivers and spawn on rocky or gravel substrate with fast-moving water and soft sandy areas with slower moving water for ammocoetes to burrow.		X														(ROM, 2012)	
3E,5E,6E	Northern Goshawk	*Accipiter gentilis*	Uncommon Stick-nesting R	extensive, deciduous, coniferous or mixed mature or old growth forest with variety of shrubs, understory trees; usually near water; each pair requires 10 to 20 km2 of suitable hunting habitat; a minimum of 12 ha of mature to old growth / mature woods is required for nesting; seldom found in forests < 100 ha	X	X					X			X					X	SWHTG (2000) Appendix G	
3E,5E	Northern Long-eared Bat	*Myotis septentrionalis*	S3	hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy							x	x			x	x	x	x		SWHTG (2000) Appendix G	
3E,5E,6E	Olive-sided Flycatcher	Contopus cooperi	Special Concern	semi-open, conifer forest, prefers spruce; near pond, lake or river; treed wetlands for nesting; burns with dead trees for perching	x	x	x					x								SWHTG (2000) Appendix G	
3E,5E,6E	Osprey	Pandion haliaetus	MNR "featured species"	associated with lakes, rivers; nests in trees near water's edge or over water; will use artificial structure; may nest in small, loose colonies	X	X										X				SWHTG (2000) Appendix G	
3E,5E,6E	Peregrine Falcon	*Falco peregrinus*	Threatened	rock cliffs, crags, especially situated near water; tall buildings in urban centres; threatened by chemical contamination; reintroduction efforts have been attempted in numerous locations throughout Ontario		X									X			X		SWHTG (2000) Appendix G	
3E,5E,6E	Pileated Woodpecker	*Dryocopus pileatus*	MNR "featured species"	extensive tracts of mature deciduous or mixed forest with water and large diameter (40+ cm) trees for cavity construction; both lowland, upland forests; sometimes found in more open agricultural areas and parks with large trees; area sensitive species requiring 40-260 ha; requires trees >25 cm dbh for nesting and trees 40+ cm dbh for roosting	X						X		X				X		X	SWHTG (2000) Appendix G	
3E	Short-eared Owl	*Asio flammeus*	Special Concern	grasslands, open areas or meadows that are grassy or bushy; marshes, bogs or tundra; both diurnal and nocturnal habits; ground nester; destruction of wetlands by drainage for agriculture is an important factor in the decline of this species; home range 25 -125 ha; requires 75-100 ha of contiguous open habitat	x			x								x		x	x	SWHTG (2000) Appendix G	
3E,5E,6E	Snapping Turtle	*Chelydra serpentina*	Special Concern	permanent, semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddy banks or bottoms; often uses soft soil or clean dry sand on south-facing slopes for nest sites; may nest at some distance from water; often hibernate together in groups in mud under water; home range size ~28 ha	X	X	X									X				SWHTG (2000) Appendix G	
3E,5E,6E	Whip-poor-will	*Caprimulgus vociferus*	Threatened	dry, open, deciduous woodlands of small to medium trees; oak or beech with lots of clearings and shaded leaflitter; wooded edges, forest clearings with little herbaceous growth; pine plantations; associated with >100 ha forests; may require 500 to 1000 ha to maintain population				X		X	X	X	X						X	SWHTG (2000) Appendix G	
5E,6E	Yellow Rail	*Coturnicops noveboracensis*	Special Concern	large, freshwater or brackish grass and sedge marshes with dense vegetation including bulrushes, horsetails, grasses; loss of wintering habitat and southern wetlands is limiting to this species	X														X	SWHTG (2000) Appendix G	