

#### 11.0 CUMULATIVE EFFECTS ASSESSMENT SUMMARY

This section summarizes the results of the Cumulative Effects Assessment presented in Sections 5.0 to 8.0. The predicted net effects of the corridors in combination with other past, present, planned, and reasonably foreseeable developments (RFDs) are presented in Tables 11.0-1, 11.0-2, and 11.0-3. Project-environment interactions assessed as having no net effects and negligible net effects on criteria were not carried forward to the Cumulative Effects Assessment, as identified in the environmental assessment method in Section 4.0.





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#### **11.1 Preliminary Proposed Corridor**

#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	
Physical Environm	ent						
Surface water (Section 5.1)	The magnitude of	the net effects was predicted to be n	egligible; therefore, a cumulative effect	s assessment with future Projects was not co	mpleted.		
Groundwater (Section 5.2)	Groundwater quantity.	Changes to groundwater quantity from the use of explosives and blasting to create level areas for transmission structures, roads and for foundation excavations	Negative	Low	LSA	Permanent	С
Air quality (Section 5.3)	The magnitude of	the net effect was predicted to be ne	gligible; therefore, a cumulative effects	assessment with future Projects was not con	npleted.		
Greenhouse gases (Section 5.4)	The magnitude of	the net effect was predicted to be ne	gligible; therefore, a cumulative effects	assessment with future Projects was not con	npleted.		
Noise (Section 5.5)	Predicted noise levels	Noise emissions from construction activities could increase existing noise levels at potential PORs	According to Section 4.6, the net effect described in Section 4.6, it is not expe developments is not expected to alter	ts assessment of the noise construction stag cted that these projects will coincide with tem the findings of the noise assessment.	e was carried forward to poral and spatial bound	o include the potential cum laries of the Project noise a	slı se
<b>Biological Environ</b>	ment						
Upland ecosystems (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Upland ecosystem availability would be reduced by 5,037 ha (1.5%) in the RSA relative to the Base Case. Loss of 2 ha (19.3% of Base Case) to the uncommon Forest regenerating depletion land cover class and loss of 2 ha (1.3% of Base Case) to the uncommon Bedrock land cover class in the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	С
	Ecosystem distribution		Negative	The distribution of upland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would be some loss and fragmentation of upland ecosystems throughout the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	С
	Ecosystem composition		Negative	Edge effects and potential introduction of invasive species may alter upland species abundance and richness.	Beyond regional (due to climate change)	Permanent/Long-term	С

Frequency/timing	Probability of Occurrence	Significance	
Continuous	Probable	Not significant	

ative effects. Based on the list of cumulative developments	
sessment. Accordingly, the consideration of these cumulative	

Continuous	Certain	Not significant
continuous	Certain	Not significant
Continuous	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	nment (cont'd)								
Riparian ecosystems	Ecosystem availability	Site preparation, construction and operation activities can result in	Negative	Predicted loss of 66 ha (1.1% in the LSA; 0.3% in the RSA)	Local	Permanent/ Long-term	Continuous	Certain	Not significant
(Section 6.1)	Ecosystem distribution	the loss or alteration of upland, wetland and riparian ecosystems	Negative	Patches of riparian ecosystems remain connected in areas surrounding the footprint	Local	Permanent/ Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness	Local	Permanent/ Long-term	Continuous	Possible	Not significant
Wetlands (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Availability of wetlands in RSA is predicted to decrease by 816 ha (3.8% of Base Case) relative to the Base Case. Loss of 6 ha (1.4% of Base Case) to the uncommon Fen-open land cover class in the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem distribution		Negative	The distribution of wetland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would some predicted loss and fragmentation of wetland ecosystems throughout the RSA. Magnitude will depend on influences from climate change	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Possible	Not significant
<ul> <li>Brook Trout (Salvelinus fontinalis)</li> <li>Lake Trout (Salvelinus namaycush)</li> <li>Walleye (Sander vitreus)</li> <li>Lake Sturgeon (Acipenser fulvescens)</li> <li>(Section 6.2)</li> </ul>	The magnitude of	the net effects are predicted to be no	egligible; therefore, a cumulative effects	s assessment with future Projects was not co	mpleted.				





Table 11.0-1:	Summary of Cumulative	Effects for the P	Preliminary	Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)	•		<u>^</u>		- -	- 		
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Churchill Range <ul> <li>8,048 ha nursery areas (incl. 355 ha that overlap with winter use areas).</li> <li>461 ha winter use areas (incl. 355 ha that overlap with nursery areas).</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest.</li> <li>24,577 ha Category 2 habitat.</li> <li>630 ha Category 3 habitat.</li> <li>Total habitat loss of 33,360 ha (all habitat categories combined).</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Brightsand Range <ul> <li>10,630 ha nursery areas (incl. 483 ha that overlap with winter use areas)</li> <li>656 ha winter use areas (incl. 483 ha that overlap with nursery areas in the range potentially affected by forest harvest</li> <li>7,602 ha Category 2 habitat</li> <li>44 ha Category 3 habitat</li> <li>Total habitat loss of 18,448 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvest</li> <li>7,602 ha Category 2 habitat</li> <li>44 ha Category 3 habitat</li> <li>Total habitat loss of 18,448 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Kinloch Range <ul> <li>313 ha nursery areas (incl. 61 ha that overlap with winter use areas)</li> <li>84 ha winter use areas (incl. 61 ha that overlap with nursery areas)</li> <li>84 ha winter use areas (incl. 61 ha that overlap with nursery areas)</li> <li>9,676 ha Category 2 habitat</li> <li>5,746 ha Category 3 habitat</li> <li>Total habitat loss of 15,757 ha (all habitat categories combined)</li> </ul> </li> </ul>	Regional (direct and indirect)	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>
				<ul> <li>Incremental increase in proportion of range disturbed.</li> </ul>					





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)	•		•	-	- -		- -	•
Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range</li> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement patterns within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> <li>Brightsand Range</li> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>

#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor





Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
nment (cont'd)								
Survival and reproduction		Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,404 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years.</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Kinloch Range         <ul> <li>Increase in predation risk associated with removal of 10,012 ha suitable habitat (i.e., Category 1 and 2)</li> </ul> </li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>
	Indicators ment (cont'd) Survival and reproduction	Indicators       Cumulative Effect         survival and reproduction	Indicators       Cumulative Effect       Direction         ment (cont'd)       Negative         Survival and reproduction       Negative         length       Image: Survival and reproduction         length       Image: Survival and reproduction     <	IndicatorsCumulative EffectDirectionMagnitudeImage: Colspan="2">Image: Churchill RangeSurvival and reproductionNegativeChurchill Range - Increase in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) – excluding forestryIncrease in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) – excluding forestryImage: Colspan="2">Image: Colspan="2"Image: Colspan="2">Image: Colspan="2">Image: Colspan="2"Image: Colspan="2">Image: Colspan="2" <tr<td>Image: Colspan="2"&lt;</tr<td>	IndicatorsCumulative EffectDirectionMagnitudeGeographic Extentsurvival and reproductionSurvival and reproductionNegativeChurchill Range <ul><li>Increase in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) - excluding forestry</li><li>More important effects expected as a result of forest harvest over the next 40 years</li><li>Potential loss of habitat in all known regionally important nursery areas</li><li>Hindrease in predation risk associated with removal of 18,404 ha suitable habitat (i.e., Category 1 and 2) - excluding forestry</li><li>More important effects expected as a result of forest harvest over the next 40 years</li><li>Potential loss of habitat in all known regionally important nursery areas</li><li>Hindrease in predation risk associated with removal of 18,404 ha suitable habitat (i.e., Category 1 and 2) - excluding forestry</li><li>More important effects expected as a result of forest harvest over the next 40 years.</li><li>Potential loss of habitat in all known regionally important nursery areas</li><li>Kinloch Range Incremental increase in predation risk associated with removal of 10,012 ha suitable habitat (i.e., Category 1 and 2).</li></ul>	IndicatorsCumulative EffectDirectionMagnitudeGeographic ExtenDuration/reversibilitysurvival and reproductionNegativeChurchill Range 	IndicatorsCumulative EffectDirectionMagnitudeGeographic ExtentDuration/reversibilityFrequency/timingImage: Image: Image	IndicatorsCumulative EffectDirectionDirectionMagnitudeGeographic ExcuIndicatorsPrequencytioningPrepublity of OccurrenceIndicatorsIndicatorsIndicatorsIndicatorsIndicatorsIndicatorsBeyond regionalPermanentContinuousPersballerIndicators

#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corride	or
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Permanent (direct loss) Long-term (sensory disturbance)	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range:</li> </ul>
Permanent (direct loss) Long-term (sensory disturbance)	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range:</li> </ul>
			Significant (significant at baseline characterizati on) Kinloch Range: Not Significant
		turbance)	turbance)





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)			•	•		•		-
Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range</li> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement patterns within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> <li>Brightsand Range</li> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>

#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,404 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years.</li> <li>Potential loss of habitat in all known regionally important effects expected as a result of forest harvest over the next 40 years.</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Kinloch Range         <ul> <li>Incremental increase in predation risk associated with removal of 10,012 ha suitable habitat (i.e., Category 1 and 2).</li> </ul> </li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>

#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor





Table 11.0-1:	Summary of Cumulative	Effects for the	<b>Preliminary P</b>	roposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose.	Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,731 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,404 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years.</li> <li>Potential loss of habitat in all known regionally important effects expected as a result of forest harvest over the next 40 years.</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Kinloch Range         <ul> <li>Incremental increase in predation risk associated with removal of 10,012 ha</li> </ul> </li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>
				suitable habitat (i.e., Category 1 and 2).					





Table 11.0-1:	Summary of Cumulative Effect	ts for the Preliminary	Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	y Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,113 ha (2.5%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effect	ts for the Preliminary	Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,113 ha (2.5%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
Moose (Section 6.3)	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose	Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative	Effects for the	Preliminary	Proposed (	Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Wolverine (Section 6.3)	Habitat availability	y Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 14,458 ha (22.0%) of the LSA Base Case.</li> <li>Direct loss of 1.6% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover.</li> <li>Higher summer temperatures.</li> <li>Small reduction in predicted abundance (two female home ranges or 80% of a male home range).</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corric	lor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)								
Wolverine (Section 6.3)	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> </ul>	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 14,458 ha (22.0%) of the LSA Base Case.</li> <li>Direct loss of 1.6% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover</li> <li>Higher summer temperatures</li> <li>Small reduction in predicted abundance (two female home ranges or 80% of a male home range)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)								
Little brown myotis (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 167 ha (2.5%) in LSA and 468 ha (1.5%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.5 ha (4.9%) in LSA and 0.7 ha (1.1%) in RSA of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant (significant at baseline characterization )
	Habitat distribution		Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	Regional	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant (significant at baseline characterization )
	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	Possible	Significant (significant at baseline characterization )
	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 167 ha (2.5%) in LSA and 468 ha (1.5%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.5 ha (4.9%) in LSA and 0.7 ha (1.1%) in RSA of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant (significant at baseline characterization )





#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)	·	• •	•	•	·			•
Little brown myotis (Section 6.3)	Habitat distribution	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	Regional	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant (significant at baseline characterization )
	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	Possible	Significant (significant at baseline characterization )
Bald eagle (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 371 ha (0.6% of RSA Baseline Characterization).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by one individual compared to Baseline Characterization.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)<sup>(e)</sup></li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corr	idor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Bald eagle (Section 6.3)       Habitat avenue         Habitat distribution       Habitat distribution         Survival a reproduct       Survival a reproduct	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 371 ha (0.6% of RSA Base Case).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by one individual compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant
	Survival and reproduction	Collisions with the transmission line causing injury or mortality to bat and birds criteria	Negative	<ul> <li>Reduction in predicted abundance by one individual compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Table 11.0-1:	Summary of Cumulative	Effects for the	Preliminary	Proposed	Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	nment (cont'd)								
Canada warbler (Section 6.3)	Habitat availability	ity Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,414 ha (3.6%) of the LSA Base Case.</li> <li>Direct loss of 3,190 ha (2.0%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 26 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corr	idor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)								
Canada warbler (Section 6.3) Habitat availability Habitat distribution Survival and reproduction Habitat availability Habitat distribution Survival and reproduction	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,414 ha (3.6%) of the LSA Base Case.</li> <li>Direct loss of 3,190 ha (2.0%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 26 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant
	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> <li>Survival and reproduction</li> </ul>	Vegetation clearing will result in an increase in edge habitat, which could increase nest predation or parasitism risk for forest breeding birds	Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 26 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative	Effects for the	Preliminary	Proposed	Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	ment (cont'd)	- -	-						-
Eastern H whip-poor-will (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,384 ha (6.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 3,852 ha (4.2%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>No reduction in predicted abundance relative to Base Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary Proposed Corric	lor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Eastern Hal whip-poor-will (Section 6.3) Hal dist	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,384 ha (6.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 3,852 ha (4.2%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>No reduction in predicted abundance relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative	Effects for the Preliminary	/ Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Common nighthawk (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,384 ha (6.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 3,855 ha (4.2%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	Local	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by three individuals, relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effects for the Preliminary	Proposed	Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environ</b>	iment (cont'd)								
Common nighthawk (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,384 ha (6.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 3,855 ha (4.2%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	Local	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by three individuals, relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative	Effects for the Preliminary	/ Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Enviror</b>	nment (cont'd)								
Olive-sided flycatcher (Section 6.3) Habitat distribution	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 573 ha (1.8%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 1,642 ha (1.1%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 17 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1:	Summary of Cumulative Effect	ts for the Preliminary	Proposed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Enviror</b>	nment (cont'd)								
Olive-sided flycatcher (Section 6.3) Habitat distribut	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 573 ha (1.8%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 1,642 ha (1.1%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 17 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-1: Summary of Cu	mulative Effects for the	<b>Preliminary Pro</b>	posed Corridor
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	
Socio-economic E	nvironment	•					
Archaeological resources (Section 7.1)	No net effects were identified for archaeological resources as a result of the Project. Consequently, the archaeological resources criterion is not carried forward for assessment of cumulative e						
Built Heritage and Cultural Heritage Landscapes (Section 7.2)	The magnitude of	The magnitude of the net effects were predicted to be no to negligible; therefore, a cumulative effects assessment with future Projects was not completed.					
Labour Market (Section 7.3)	The predicted net	effects were positive in direction and	were therefore not carried forward to t	he cumulative effects assessment.			
Regional Economy (Section 7.3)	The predicted net	effects were positive in direction and	were therefore not carried forward to t	he cumulative effects assessment.			
Government Finances (Section 7.3)	The negative net effects were predicted to be of negligible magnitude and were therefore not carried forward to the cumulative effects assessment. The predicted positive net effects were also						
Housing and Temporary Accommodation (Section 7.3)	<ul> <li>Population change</li> <li>Housing demand</li> <li>Housing supply</li> </ul>	Project direct construction workforce and supplier requirements could increase demand for rental housing and/or temporary accommodation, and potentially affect rental housing and/or temporary accommodation supply in certain LSA communities	Negative	Low to Moderate	Local	Reversible S	
Services and Infrastructure (Section 7.3). Includes: emergency and health services water, waste, energy infrastructure transportation	The magnitude o	f the net effects were predicted t	o be negligible; therefore, a cumula	ative effects assessment with future Proje	ects was not complete	∍d.	
Community Wellbeing (Section 7.3)	Nuisance	Project construction activities could affect ambient noise levels along the ROW; potential for nuisance effects	As no RFD projects coincide with cum undertaken.	ulative effects temporal and spatial boundarie	es for the Project noise	assessment, no cumulative e	

Frequency/timing	Probability of Occurrence	Significance
effects.		

o not carried forward to the cumulative effects assessment.

hort-term	Probable	Not significant

effects assessment of nuisance noise on community wellbeing is





#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
Socio-economic E	nvironment (cont'o	1)							
Parks and protected areas (Section 7.4)	The magnitude of t	the net effect was predicted to be ne	egligible; therefore, a cumulative effects	assessment with future Projects was not cor	npleted.				
Commercial Industry Land and Resource Use (e.g., mining and aggregate, forestry, agriculture) (Section 7.4)	Resource availability	Changes in the availability of resources for the forest industry	Negative	Moderate	Regional	Long-term	Continuous	Certain	Not significant
Outdoor Tourism and Recreational Land and Resource Use (Section 7.4) assessed through consumptive and non-consumptive: hunting, Trapping, fishing and Guide Outfitting Other Outdoor Tourism and Recreation	Land Use Quantity (access)	Net changes in the quantity of land available for outdoor tourism and recreational use (i.e., access)	<ul> <li>Positive (for hunters, trappers, and non-consuming recreational land users).</li> <li>Negative (for guided outfitters and tourist operators).</li> </ul>	Moderate	Regional	Long-term	Continuous	Certain	Not significant





#### Table 11.0-1: Summary of Cumulative Effects for the Preliminary Proposed Corridor

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility				
Socio-economic E	nvironment (cont'o	1)								
Human health (Section 7.6)	<ul> <li>The magnitude Section 4.6.</li> <li>The magnitude projects will co assessment of</li> </ul>	<ul> <li>The magnitude of the net effect on human health from changes to ambient concentrations due to CAC and fugitive dust emissions was predicted to be negligible; therefore, a cumulative e Section 4.6.</li> <li>The magnitude of the net effect on human health from changes to noise emissions during construction stage activities was predicted to be low. However, based on the list of cumulative de projects will coincide with temporal and spatial boundaries of the Project noise assessment and therefore, the human health assessment. As a result, no further human health effects from assessment of noise on human health was undertaken.</li> </ul>								
Visual quality (Section 7.5)	Visibility of the Project from key viewpoints	Visibility of built structures and maintenance of vegetation disturbances related to the operation of the Project can adversely affect visual quality.	Negative	Low to Moderate	Local	Permanent/Long-term	С			
	Compatibility of Project with existing landscape	Vegetation clearing, grading, and the assembly of built structures will introduce visible disturbances to the existing landscape that can adversely affect visual quality	Negative	Low to Moderate	Local	Permanent/Long-term	С			
Aboriginal and Treaty Rights and Interests (as identified through engagement, Treaties, and other methods) (Section 8.0)	Quantity and quality of identified cultural use locations and access routes where use of or access to those locations is changed.	Site preparation, construction, operation and maintenance of the Project footprint could affect the quantity and location of access routes (i.e., increased access)	Positive and negative (traditional land and resource users)	Moderate	Local	Long-term	С			

n/a = not applicable.

Frequency/timing	Probability of Occurrence	Significance

effects assessment with future Projects was not completed as per

evelopments described in Section 4.6, it is not expected that these n noise are anticipated; therefore, no cumulative effects

Continuous	Possible	Not significant
Continuous	Possible	Not significant
Continuous	Certain	Not significant





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#### **11.2 Corridor Alternative Around Mishkeegogamang**

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibilit	
Physical Environment	- <b>-</b>	•	1		1		
Surface water (Section 5.1)	The magnitude of the ne	t effects was predicted to be negligible; there	fore, a cumulative effects	assessment with future Projects was not co	ompleted.		
Groundwater (Section 5.2)	Groundwater quantity.	Changes to groundwater quantity from the use of explosives and blasting to create level areas for transmission structures, roads and for foundation excavations	Negative	Low	LSA	Permanent	
Air quality (Section 5.3)	The magnitude of the ne	t effect was predicted to be negligible; therefore	ore, a cumulative effects a	assessment with future Projects was not co	npleted.	-	
Greenhouse gases (Section 5.4)	The magnitude of the ne	t effect was predicted to be negligible; therefo	ore, a cumulative effects a	assessment with future Projects was not co	mpleted.		
Noise (Section 5.5)	Predicted noise levels Noise emissions from construction activities could increase existing noise levels at potential PORs According to Section 4.6, the net effects assessment of the noise construction stage was carried forward to increase developments described in Section 4.6, it is not expected that these projects will coincide with temporal and spectral consideration of these cumulative developments are not expected to alter the findings of the noise assessment						
<b>Biological Environmen</b>	ıt						
<b>Biological Environment</b> Upland ecosystems (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Upland ecosystem availability would be reduced by 10,793 ha (3.8%) in the RSA relative to the Base Case. Loss of 2 ha (1.3% of Base Case) to the uncommon Forest regenerating depletion land cover class and loss of <1 ha (0.3% of Base Case) to the uncommon Bedrock land cover class in the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	
	Ecosystem distribution		Negative	The distribution of upland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would be some loss and fragmentation of upland ecosystems throughout the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	
	Ecosystem composition		Negative	Edge effects and potential introduction of invasive species may alter upland species abundance and richness.	Beyond regional (due to climate change)	Permanent/Long-term	

/	Frequency/timing	Probability of Occurrence	Significance

Continuous	Probable	Not significant

#### e the potential cumulative effects. Based on the list of cumulative al boundaries of the Project noise assessment. Accordingly, the

Continuous	Certain	Not significant
Continuous	Certain	Not significant
Continuous	Possible	





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Riparian ecosystems (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Availability of riparian habitat in the RSA is predicted to decrease by 754 ha (3.7% of Base Case) relative to the Base Case in the RSA. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Certain	Not significant
	Ecosystem distribution		Negative	There would some loss and fragmentation of riparian habitat throughout the RSA relative to the Base Case, but riparian ecosystems remain well connected. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Possible	Not significant
Wetlands (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Availability of wetlands in RSA is predicted to decrease by 823 ha (4.7% of Base Case) relative to the Base Case. Loss of 19 ha (2.6% of Base Case) to the uncommon Fen-open land cover class in the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem distribution		Negative	The distribution of wetland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would some predicted loss and fragmentation of wetland ecosystems throughout the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Possible	Not significant

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang





#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang

			-						
Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
<ul> <li>Brook Trout (Salvelinus fontinalis)</li> <li>Lake Trout (Salvelinus namaycush)</li> <li>Walleye (Sander vitreus)</li> <li>Lake Sturgeon (Acipenser fulvescens)</li> <li>(Section 6.2)</li> </ul>	The magnitude of the net	effects is predicted to be negligible; therefor	e, a cumulative effects as	sessment with future Projects was not com	pleted.				





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	: (cont'd)	1	I	1	I		<u> </u>	<u> </u>	
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Churchill Range</li> <li>8,210 ha nursery areas (incl. 355 ha that overlap with winter use areas)</li> <li>357 ha winter use areas (incl. 355 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>24,668 ha Category 2 habitat</li> <li>93 ha Category 3 habitat</li> <li>Total habitat loss of 32,974 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvestino.</li> </ul>	Regional (direct and indirect)	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>
				<ul> <li>Brightsand Range</li> <li>10,638 ha nursery areas (incl. 490 ha that overlap with winter use areas)</li> <li>675 ha winter use areas (incl. 490 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,900 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> <li>Kinloch Range</li> </ul>					o igninistant
				<ul> <li>172 ha nursery areas</li> <li>0 ha winter use areas</li> <li>9,632 ha Category 2 habitat</li> <li>5,702 ha Category 3 habitat</li> <li>Total habitat loss of 15,506 ha (all habitat categories combined)</li> <li>Incremental increase in proportion of range disturbed.</li> </ul>					

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance		
Biological Environment (cont'd)											
Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range</li> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry and transmission line. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> <li>Brightsand Range</li> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>		

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environmen</b>	t (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,881 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,516 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> </ul> </li> <li>Kinloch Range         <ul> <li>Increase in predation risk associated with removal of 9,804 ha suitable habitat (i.e., Category 1 and 2).</li> </ul> </li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang




Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)	·	<u> </u>	·					
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Churchill Range <ul> <li>8,210 ha nursery areas (incl. 355 ha that overlap with winter use areas)</li> <li>357 ha winter use areas (incl. 355 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>24,668 ha Category 2 habitat</li> <li>93 ha Category 3 habitat</li> <li>Total habitat loss of 32,974 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Brightsand Range <ul> <li>10,638 ha nursery areas (incl. 490 ha that overlap with winter use areas)</li> <li>675 ha winter use areas (incl. 490 ha</li> </ul> </li> </ul>	Regional (direct and indirect)	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>
			<ul> <li>b) of the winter use close (incl. for the that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,900 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul>						
				<ul> <li>Kinloch Range</li> <li>172 ha nursery areas</li> <li>0 ha winter use areas</li> <li>9,632 ha Category 2 habitat</li> <li>5,702 ha Category 3 habitat</li> <li>Total habitat loss of 15,506 ha (all habitat categories combined)</li> <li>Incremental increase in proportion of range disturbed.</li> </ul>					





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range</li> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry and transmission line. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> <li>Brightsand Range</li> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range from forestry. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range and reduce connectivity with the Northwestern portion of the range from forestry. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environmen</b>	t (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,881 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,516 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> </ul> </li> <li>Kinloch Range         <ul> <li>Incremental increase in predation risk associated with removal of 9,804 ha suitable habitat (i.e., Category 1 and 2).</li> </ul> </li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	: (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose	Negative	<ul> <li>Churchill Range</li> <li>Increase in predation risk associated with removal of 32,881 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> <li>Brightsand Range</li> <li>Increase in predation risk associated with removal of 18,516 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas</li> <li>Brightsand Range</li> <li>Increase in predation risk associated with removal of 18,516 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> <li>Kinloch Range</li> <li>Incremental increase in predation risk associated with removal of 9,804 ha suitable habitat (i.e., Category 1 and 2).</li> </ul>	Beyond regional	Permanent	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterizati on)</li> <li>Brightsand Range: Significant (significant at baseline characterizati on)</li> <li>Kinloch Range: Not Significant</li> </ul>





Table 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Moose (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,897 ha (4.1%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Moose (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,897 ha (4.1%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose	Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Wolverine (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 9,217 ha (18.2%) of the LSA Base Case.</li> <li>Direct loss of 1.5% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
Habit	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover</li> <li>Higher summer temperatures</li> <li>Small reduction in predicted abundance (two female home ranges or 70% of a male home range)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-2:	Summary of Cumulative	e Effects for the for the Co	orridor Alternative Around	Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Wolverine (Section 6.3)	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> </ul>	ility tion Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 9,217 ha (18.2%) of the LSA Base Case.</li> <li>Direct loss of 1.5% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover</li> <li>Higher summer temperatures</li> <li>Small reduction in predicted abundance (two female home ranges or 70% of a male home range)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Little brown myotis (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 250 ha (3.3%) in LSA and 1,188 ha (3.5%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.4 ha (1.8% in LSA and 0.8% in RSA) of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant (significant at baseline characterization )
	Habitat distribution		Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	Regional	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant (significant at baseline characterization )
	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	possible	Significant (significant at baseline characterization )





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)			•	-		-		
Little brown myotis (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 250 ha (3.3%) in LSA and 1,188 ha (3.5%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.4 ha (1.8% in LSA and 0.8% in RSA) of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant (significant at baseline characterization )
	Habitat distribution		Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	Regional	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant (significant at baseline characterization )
	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	Possible	Significant (significant at baseline characterization )





Table 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Bald eagle (Section 6.3) Habitat distribution	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 855 ha (2.0% of RSA Baseline Characterization)).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by two individuals in compared to Baseline Characterization.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)	•	•	• •			•	•	
Bald eagle (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 855 ha (2.0% of RSA Baseline Characterization).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by two individuals in compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant
	Survival and reproduction	Collisions with the transmission line causing injury or mortality to bat and birds criteria	Negative	<ul> <li>Reduction in predicted abundance by two individuals in compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Table 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Canada warbler (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,928 ha (5.4%) of the LSA Base Case.</li> <li>Direct loss of 5,489 (3.8%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant	
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)<sup>(c)</sup></li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)<sup>(d)</sup></li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Canada warbler (Section 6.3)       Habitat availability       Sensory disturbance (lights, sm dust, human activity, corona-rei viewscape) can change wildlife availability, use and connectivit (movement and behaviour), wh to changes in wildlife abundance distribution         Habitat distribution         Survival and reproduction	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,928 ha (5.4%) of the LSA Base Case.</li> <li>Direct loss of 5,489 (3.8%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant	
	Habitat distribution	T	Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)<sup>(c)</sup></li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)<sup>(d)</sup></li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant
	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> <li>Survival and reproduction</li> </ul>	Vegetation clearing will result in an increase in edge habitat, which could increase nest predation or parasitism risk for forest breeding birds	Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)<sup>(c)</sup></li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)<sup>(d)</sup></li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Гable 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Eastern whip-poor-will (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,388 ha (7.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,469 ha (5.3%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to high mobility.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>No reduction in predicted abundance relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,388 ha (7.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,469 ha (5.3%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to high mobility.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>No reduction in predicted abundance relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Effect	nulative Effect Direction Magnitude Geographic Extent		Duration/reversibility	
<b>Biological Environment</b>	(cont'd)					1
Common nighthawk (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,388 ha (7.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,473 ha (5.3%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by three individuals, relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>
	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,388 ha (7.3%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,473 ha (5.3%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by three individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term,</li> </ul>

#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang

Magnitude depends on the influences from climate change.

(sensory

disturbance)

uration/reversibility	Frequency/timing	Probability of Occurrence	Significance	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant	
Long-term to Permanent (direct loss and natural factors) Medium-term, Long-term, or Permanent (sensory disturbance)	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant	





Table 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang	
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Olive-sided flycatcher (Section 6.3)	Habitat availability	and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 1,805 ha (5.4%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 7,121 ha (5.1%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 64 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Table 11.0-2:	Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang
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Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance
<b>Biological Environment</b>	(cont'd)								
Olive-sided flycatcher (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 1,805 ha (5.4%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 7,121 ha (5.1%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction	urvival and eproduction	Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 64 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
Socio-economic Enviro	nment								
Archaeological resources (Section 7.1)	No net effects were iden	ified for archaeological resources as a result	of the Project. Conseque	ntly, the archaeological resources criterion i	s not carried forward f	or assessment of cumulativ	ve effects.		
Built Heritage and Cultural Heritage Landscapes	The magnitude of the ne	t effects was predicted to be no to negligible e	effect; therefore, a cumula	ative effects assessment with future projects	was not completed.				

Labour Market (Section 7.3)	Th	he predicted net effects were positive in direction and were therefore not carried forward to the cumulative effects assessment.								
Regional Economy (Section 7.3)	Th	predicted net effects were positive in direction and were therefore not carried forward to the cumulative effects assessment.								
Government Finances (Section 7.3)	Th	e negative net effects	were predicted to be of negligible magnitude	and were therefore not o	carried forward to the cumulative effects as	ssessment. The predicte	ed positive ne			
Housing and Temporary Accommodation (Section 7.3)	•	Population change Housing demand Housing supply	Project direct construction workforce and supplier requirements could increase demand for rental housing and/or temporary accommodation, and potentially affect rental housing and/or temporary accommodation supply in certain LSA communities	Negative	Low to Moderate	Local	Reversible			

(Section 7.2)

net effects were also not carried forward to the cumulative effects assessment.

Short-term	Probable	Not significant





Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance		
Socio-economic Enviro	nment (cont'd)										
Services and Infrastructure (Section 7.3). Includes: emergency and health services water, waste, energy infrastructure transportation	The negative net effects	were predicted to be of negligible magnitude	and were therefore not ca	arried forward to the cumulative effects ass	essment.						
Community Wellbeing (Section 7.3)	Nuisance	Project construction activities could affect air quality along the ROW; potential for nuisance effects	As no RFD projects coin community wellbeing is	cide with cumulative effects temporal and s undertaken.	spatial boundaries for t	he Project noise assessme	nt, no cumulative effect	s assessment of nuisa	nce noise on		
Parks and protected areas (Section 7.4)	The magnitude of the net effect was predicted to be negligible; therefore, a cumulative effects assessment with future Projects was not completed.										
Commercial Industry Land and Resource Use (e.g., mining and aggregate, forestry, agriculture) (Section 7.4)	Resource availability	Changes in the availability of resources for the forest industry	Negative	Moderate	Regional	Long-term	Continuous	Certain	Not significant		
Outdoor Tourism and Recreational Land and Resource Use (Section 7.4) assessed through consumptive and non-consumptive: hunting, Trapping, fishing and Guide Outfitting Other Outdoor Tourism and Recreation	Land Use Quantity (access)	Net changes in the quantity of land available for outdoor tourism and recreational use (i.e., access)	<ul> <li>Positive (for hunters, trappers, and non- consuming recreational land users).</li> <li>Negative (for guided outfitters and tourist operators).</li> </ul>	Moderate	Regional	Long-term	Continuous	Certain	Not significant		





#### Table 11.0-2: Summary of Cumulative Effects for the for the Corridor Alternative Around Mishkeegogamang

Criteria	Indicators	Cumulative Effect	Direction	Magnitude	Geographic Extent	Duration/reversibility	Frequency/timing	Probability of Occurrence	Significance		
Socio-economic Enviro	onment (cont'd)										
Human health (Section 7.6)	<ul> <li>The magnitude of the per Section 4.6.</li> <li>The magnitude of the magnit</li></ul>	e net effect on human health from changes to e net effect on human health from changes to	ambient concentrations	due to CAC and fugitive dust emissions wa construction stage activities was predicted t	s predicted to be neglig	gible; therefore, a cumulativ sed on the list of cumulativ	ve effects assessment v e developments descrit	with future Projects was bed in Section 4.6, it is	not completed as not expected that		
	these projects will coincide with temporal and spatial boundaries of the Project noise assessment and therefore, the human health assessment. As a result, no further human health effects from noise are anticipated; therefore, no cumulative effects assessment of noise on human health was undertaken.										
Visual quality (Section 7.5)	Visibility of the Project from key viewpoints	Visibility of built structures and maintenance of vegetation disturbances related to the operation of the Project can adversely affect visual quality.	Negative	Low to Moderate	Local	Permanent/Long-term	Continuous	Possible	Not significant		
	Compatibility of Project with existing landscape	Vegetation clearing, grading, and the assembly of built structures will introduce visible disturbances to the existing landscape that can adversely affect visual quality	Negative	Low to Moderate	Local	Permanent/Long-term	Continuous	Possible	Not significant		
Aboriginal and Treaty Rights and Interests (as identified through engagement, Treaties, and other methods) (Section 8.0)	Quantity and quality of identified cultural use locations and access routes where use of or access to those locations is changed.	Site preparation, construction, operation and maintenance of the Project footprint could affect the quantity and location of access routes (i.e., increased access)	n/a	n/a	n/a	n/a	n/a	n/a	n/a		

n/a = not applicable.





### **11.3 Corridor Alternative Through Mishkeegogamang**

Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Physical Environme</b>	nt								
Surface water (Section 5.1)	The magnitude of the net ef	fects was predicted to be negligible; therefore, a cum	ulative effects assessment wi	th future Projects was not completed.					
Groundwater (Section 5.2)	Groundwater quantity.	Changes to groundwater quantity from the use of explosives and blasting to create level areas for transmission structures, roads and for foundation excavations	Negative	Low	LSA	Permanent	Continuous	Probable	Not significant
Air quality (Section 5.3)	The magnitude of the net ef	fect was predicted to be negligible; therefore, a cumu	lative effects assessment with	n future Projects was not completed.	-	-	-	-	-
Greenhouse gases (Section 5.4)	The magnitude of the net ef	fect was predicted to be negligible; therefore, a cumu	Ilative effects assessment with	n future Projects was not completed.					
Noise (Section 5.5)	Predicted noise levels	Noise emissions from construction activities could increase existing noise levels at potential PORs	According to Section 4.6, the cumulative developments de Accordingly, the consideration	e net effects assessment of the noise cons scribed in Section 4.6, it is not expected th on of these cumulative developments is no	truction stage was nat these projects t expected to alter	carried forward to inclu will coincide with tempo the findings of the nois	ide the potential cu ral and spatial bou e assessment.	mulative effects. Ba ndaries of the Proje	ised on the list of ct noise assessment.
<b>Biological Environm</b>	nent								
Upland ecosystems (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Upland ecosystem availability would be reduced by 10,767 ha (3.9%) in the RSA relative to the Base Case. Loss of 2 ha change (1.3% of Base Case) to the uncommon land cover class (i.e., Forest regenerating depletion) in the RSA. No loss to the uncommon bedrock land cover class. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem distribution		Negative	The distribution of upland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would be some loss and fragmentation of upland ecosystems throughout the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Edge effects and potential introduction of invasive species may alter upland species abundance and richness.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Possible	Not significant

	Continuous	Probable	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Riparian ecosystems (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Availability of riparian habitat in the RSA is predicted to decrease by 751 ha (3.8% of Base Case) relative to the Base Case in the RSA. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Certain	Not significant
Wetlands	Ecosystem distribution Ecosystem composition		Negative	There would some loss and fragmentation of riparian habitat throughout the RSA relative to the Base Case, but riparian ecosystems remain well connected. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Certain	Not significant
	Ecosystem composition	N Oite menoration and exception N	Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness. Magnitude will depend on influences from climate change.	Local	Permanent/ Long-term	Continuous	Possible	Not significant
Wetlands (Section 6.1)	Ecosystem availability	Site preparation, construction and operation activities can result in the loss or alteration of upland, wetland and riparian ecosystems	Negative	Availability of wetlands in RSA is predicted to decrease by 821 ha (5.5% of Base Case) relative to the Base Case. Loss of 19 ha (3.0% of Base Case) to the uncommon Fen-open land cover class in the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem distribution		Negative	The distribution of wetland ecosystems in the LSA and RSA in the RFD Case would be similar to the distribution in the Base Case. There would some predicted loss and fragmentation of wetland ecosystems throughout the RSA. Magnitude will depend on influences from climate change.	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Certain	Not significant
	Ecosystem composition		Negative	Small changes in water quality and flow and potential introduction of invasive species may alter riparian species abundance and richness	Beyond regional (due to climate change)	Permanent/Long-term	Continuous	Possible	Not significant





Table 11.0-3:	Summary of Cumulative	Effects for the for the	Corridor Alternative	Through Mishkeegogamang
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Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
<ul> <li>Brook Trout (Salvelinus fontinalis)</li> <li>Lake Trout (Salvelinus namaycush)</li> <li>Walleye (Sander vitreus)</li> <li>Lake Sturgeon (Acipenser fulvescens)</li> <li>(Section 6.2)</li> </ul>	The magnitude of the net effe	ects is predicted to be negligible; therefore, a cumula	ative effects assessment with t	future Projects was not completed.					





Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
nent (cont'd)	·	•		•	•	•		•
Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Churchill Range <ul> <li>8,171 ha nursery areas (incl. 355 ha that overlap with winter use areas)</li> <li>357 ha winter use areas (incl. 355 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>24,668 ha Category 2 habitat</li> <li>78 ha Category 3 habitat</li> <li>Total habitat loss of 32,920 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Brightsand Range <ul> <li>10,685 ha nursery areas (incl. 490 ha that overlap with winter use areas)</li> <li>675 ha winter use areas (incl. 490 ha that overlap with nursery areas in the range potentially affected by forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,948 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,948 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Kinloch Range <ul> <li>157 ha nursery areas</li> <li>0 ha winter use areas</li> <li>9,648 ha Category 2 habitat</li> <li>5,699 ha Category 3 habitat</li> <li>Total habitat loss of 15,503 ha (all habitat categories combined)</li> <li>Incremental increase in proportion</li> </ul> </li> </ul>	Regional (direct and indirect)	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>
	Indicators ent (cont'd) Habitat availability	Indicators         Cumulative Pathway           ent (cont'd)         Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability. use, and connectivity and influence wildlife abundance and distribution	Indicators         Cumulative Pathway         Direction           ent (cont'd)	Indicators         Cumulative Pathway         Direction         Magnitude           ant (contd)         Site preparation, construction, operation and connectivity and influence activation in the loss or alteration of vegetation and topography that may change habitat availability. Use, and connectivity and influence wildlife abundance and distribution         Negative         Churchill Range         8.011 ha nursery rares (incl. 336 ha that overlap with winter use areas in the range potentially arteras)         337 ha winter use areas (incl. 336 ha that overlap with nursery areas in the range potentially arteras)         337 ha winter use areas (incl. 346 ha Category 2 habitat         7.04 habitat loss of 32,822 ha (all habitat categories combined)         1.0426 ha Category 2 habitat         7.04 habitat loss of 32,822 ha (all habitat categories combined)         1.0685 ha nursery areas (incl. 440 ha that overlap with nursery areas)           Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.         8.01 regionally important nursery areas)         8.01 regionally important nursery areas)           Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.         8.01 regionally important nursery areas)         8.01 regionally important nursery areas)           Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.         8.01 regionally important nursery areas)         8.02 regionally important nursery areas)           Increase in the range potentially affected by forest harvest         9.04 ha (all ba	Indicators         Cumulative Pathway         Direction         Magnitude         Geographic Extent           Itabilitat availability         Site preparation, construction, operation and alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution         Negative         Churchill Range         Rand Indirect)         Radjoint (influence areas)         35 h that overlap with winter use areas)         37 h a winter use areas (incl. 35 h that overlap with unsery areas)         All regional/important nursery areas)         37 h a category 2 habitat         To be Category 2 habitat         To be Category 2 habitat         10,855 h and to verlap with winter use areas)         38 h and to verlap with unsery areas)         24,068 ha Category 2 habitat         10,055 ha nursery areas (incl. 400 ha that overlap with nursery areas)         39 ha that overlap with nursery areas)         10,055 ha nursery areas (incl. 400 ha that overlap with nursery areas)         39 ha that co	Indicators         Cumulative Pathway         Direction         Magnitude         Geographic Extent Teversibility         Duration/ reversibility           Habitat availability         Site proparation. construction. operation and materiation of vegetation and topography that may change habitat availability, use, and canneed heads to alteration of vegetation and solution belows on alteration of vegetation and solution belows on alteration of vegetation and solution below and influence whell's abundance and sistibution         Nagative         Churchill Range         Regional (dred as 17) ha nursery areas (incl. 336 ha halt overlaps with induced) areas in the cange potentially affected by forest harvestia         Permanent (direct, use)           2.068 ha Category 2 habitat         78 ha Category 2 habitat         78 ha Category 2 habitat           717 ha unserve areas (incl. 336 ha Intervention of range disturbance)         78 ha Marcine areas (incl. 400 ha Inta overlap with induced)         Permanent (and induced)           8         Tradinability (moratina nursery areas in the range potentially affected by forest harvesting.         Regional (moratina areas)         Permanent (and induced)           9         All regionally important nursery areas in the range potentially affected by forest harvesting.         Permanent (and induced)         Permanent (and induced)           8         Total habitations of 18,945 ha (all habitat categories combined)         Increase (incl. 400 ha Inta overlap with induced)         Permanent (and induced)           8         Total habiton tora set of 35 ha Category	Indicators         Cumulative Pathway         Direction         Magnitude         Geographic Extent Precentibility         Duration recording           Habitat availability         Site preparation, construction, operation and maintenance activities can result in the loss of change habitat availability, use, and connectivity and influence widilife abundance and distribution         Negative         Churchill Range         e.171 ha nursery areas (incl. 355 ha that overlap with nursery areas)         Regional (direct)         Constructions (disturbance)           I regionally interve areas (incl. 355 ha that overlap with nursery areas)         The wither use areas (incl. 355 ha that overlap with nursery areas)         Regional (direct)         I complexity (disturbance)           I regionally interve areas (incl. 355 ha that coverlap with nursery areas)         Regional (direct)         I complexity (disturbance)         I complexity (disturbance)           I regionally interve areas (incl. 355 ha that coverlap with nursery areas)         Regional (direct)         I complexity (disturbance)         I complexity (disturbance)         I complexity (disturbance)           I regionally interve areas (incl. 359 ha that coverlap with nursery areas)         Regional (direct)         I complexity (disturbance)         I complexity (disturbance)           I regionally interve areas (incl. 400 ha that coverlap with nursery areas)         Regionally interve areas (incl. 400 ha that coverlap with nursery areas)         Regionally interve areas (incl. 400 ha that coverlap with nursery areas)         Regionally i	Indicators         Cumulative Pathway         Direction         Magnitude         Because to the state of the state





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	nent (cont'd)			•	-	-		- -	-
Biological Environm Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range         <ul> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry and transmission line. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> </ul> </li> <li>Brightsand Range         <ul> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect local movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul> </li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>
				and transmission lines. Could affect local movement patterns.					





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ient (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Churchill Range</li> <li>Increase in predation risk associated with removal of 32,842 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> <li>Brightsand Range</li> <li>Increase in predation risk associated with removal of 18,564 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> <li>Kinloch Range</li> <li>Incremental increase in predation risk associated with removal of 9,805 ha suitable habitat (i.e., Category 1 and 2).</li> </ul>	Permanent	<ul> <li>Permanent (direct loss and linear corridors)</li> <li>Medium-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)	•	•			•		•	
Forest-dwelling woodland caribou (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Churchill Range <ul> <li>8,171 ha nursery areas (incl. 355 ha that overlap with winter use areas)</li> <li>357 ha winter use areas (incl. 355 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>24,668 ha Category 2 habitat</li> <li>78 ha Category 3 habitat</li> <li>Total habitat loss of 32,920 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Brightsand Range <ul> <li>10,685 ha nursery areas (incl. 490 ha that overlap with winter use areas)</li> <li>675 ha winter use areas (incl. 490 ha that overlap with nursery areas)</li> <li>All regionally important nursery areas in the range potentially affected by forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,948 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvest</li> <li>7,694 ha Category 2 habitat</li> <li>383 ha Category 3 habitat</li> <li>Total habitat loss of 18,948 ha (all habitat categories combined)</li> <li>Increase in proportion of range disturbed over the medium-term, magnitude dependent on extent of forest harvesting.</li> </ul> </li> <li>Kinloch Range <ul> <li>157 ha nursery areas</li> <li>0 ha winter use areas</li> <li>9,648 ha Category 2 habitat</li> <li>5,699 ha Category 3 habitat</li> <li>Total habitat loss of 15,503 ha (all habitat categories combined)</li> <li>Incremental increase in proportion of range disturbed.</li> </ul> </li> </ul>	Regional (direct and indirect)	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> </ul>	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	nent (cont'd)								
Biological Environm Forest-dwelling woodland caribou (Section 6.3)	Habitat distribution		Negative	<ul> <li>Churchill Range         <ul> <li>Movement constraints in the northwest portion of the range associated with mining and forest harvest. Could affect movement within the range and reduce connectivity with the Kinloch and Berens ranges.</li> <li>Movement constraints in the northeast (currently low disturbance density) from forestry and transmission line. Could affect movement within the range and reduce connectivity with the Kinloch and Brightsand ranges.</li> </ul> </li> <li>Brightsand Range         <ul> <li>Movement constraints in the west-central portion of the range from forestry, mining and transmission line. Could affect local movement patterns and reduce connectivity with the Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the northwestern portion of the range from forestry. Could affect local movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns and movement with Churchill Range.</li> <li>Movement constraints in the southern portion of the range. Could affect movement patterns in this portion of the range and reduce connectivity with the Nipigon range.</li> </ul> </li> </ul>	Beyond regional	<ul> <li>Permanent (direct loss)</li> <li>Long-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>
				connectivity with the Nipigon range. <b>Kinloch Range</b> Movement constraints around the Town of Pickle Lake associated with mining and transmission lines. Could affect local movement patterns.					





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Churchill Range</li> <li>Increase in predation risk associated with removal of 32,842 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> <li>Brightsand Range</li> <li>Increase in predation risk associated with removal of 18,564 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> <li>Kinloch Range</li> <li>Incremental increase in predation risk associated with removal of 9,805 ha suitable habitat (i.e., Category 1 and 2).</li> </ul>	Permanent	<ul> <li>Permanent (direct loss and linear corridors)</li> <li>Medium-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Forest-dwelling woodland caribou (Section 6.3)	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose	Negative	<ul> <li>Churchill Range         <ul> <li>Increase in predation risk associated with removal of 32,842 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> </ul> </li> <li>Brightsand Range         <ul> <li>Increase in predation risk associated with removal of 18,564 ha suitable habitat (i.e., Category 1 and 2) – excluding forestry</li> <li>More important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important effects expected as a result of forest harvest over the next 40 years</li> <li>Potential loss of habitat in all known regionally important nursery areas.</li> </ul> </li> <li>Kinloch Range         <ul> <li>Increase in predation risk associated with removal of 9,805 ha suitable habitat (i.e., Category 1 and 2).</li> </ul> </li> </ul>	Permanent	<ul> <li>Permanent (direct loss and linear corridors)</li> <li>Medium-term (sensory disturbance)</li> </ul>	Continuous	Probable	<ul> <li>Churchill Range: Significant (significant at baseline characterization)</li> <li>Brightsand Range: Significant (significant at baseline characterization)</li> <li>Kinloch Range: Not Significant</li> </ul>
Moose (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,885 ha (4.2%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Moose (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 2,885 ha (4.2%) of the LSA Base Case.</li> <li>Direct loss of 1.0% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs</li> <li>Contracted distribution due to climate change</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Moose (Section 6.3)	Survival and reproduction		Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction	Use of linear corridors and converted habitat (i.e., younger, more productive forest) by prey and predators leading to decreases in survival and reproduction of caribou and moose	Negative	<ul> <li>Small increase in mortality after implementation of impact management measures</li> <li>Reduced wetland and mature forest cover</li> <li>Greater overlap between moose and white-tailed deer (predation and meningeal brain worm)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss, linear corridors, and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (linear corridors and sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Wolverine (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 5,958 ha (13.7%) of the LSA Base Case.</li> <li>Direct loss of 1.4% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover</li> <li>Higher summer temperatures</li> <li>Small reduction in predicted abundance (two female home ranges or 70% of a male home range)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Wolverine (Section 6.3)	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> </ul>	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 5,958 ha (13.7%) of the LSA Base Case.</li> <li>Direct loss of 1.4% of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance during construction and reclamation activities.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to RFDs.</li> <li>Contracted distribution due to climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Probable (direct loss and sensory disturbance)</li> <li>Possible (natural factors)</li> </ul>	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduced spring snow cover</li> <li>Higher summer temperatures</li> <li>Small reduction in predicted abundance (two female home ranges or 70% of a male home range)</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)	•		<u>^</u>	-	- 	7	-	-
Little brown myotis (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 239 ha (3.2%) in LSA and 1,177 ha (3.8%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.2 ha (1.2%) in LSA and 0.4 ha (1.0%) in RSA of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant (significant at baseline characterization)
	Habitat distribution		Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	Regional	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant (significant at baseline characterization)





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Little brown myotis (Section 6.3)	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	Possible	Significant (significant at baseline characterization)
	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 239 ha (3.2%) in LSA and 1,177 ha (3.8%) in RSA of potential maternity roosting habitat, relative to Base Case.</li> <li>Direct loss of 0.2 ha (1.2%) in LSA and 0.4 ha (1.0%) in RSA of potential hibernacula habitat, relative to Base Case.</li> <li>No avoidance of hibernacula habitat due to sensory disturbance by adhering to setbacks.</li> <li>Avoidance of maternity roosting habitat due to sensory disturbance in the LSA.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors).</li> <li>Medium, Long-term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (direct loss and avoidance of hibernacula habitat).</li> <li>Probable (direct loss and avoidance of summer maternity habitat, and natural factors).</li> </ul>	Significant
	Habitat distribution		Negative	<ul> <li>Slight shift in maternity roost locations to due removal of habitat.</li> <li>No change to hibernacula habitat distribution after impact management measures.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long term to Permanent (direct loss and natural factors).</li> <li>Medium, Long term, or Permanent (sensory disturbance).</li> </ul>	<ul> <li>Continuous (sensory disturbance).</li> <li>Frequent to Continuous (direct loss and natural factors).</li> </ul>	<ul> <li>Unlikely (hibernacula habitat)</li> <li>Possible (maternity habitat)</li> </ul>	Significant
	Survival and reproduction		Neutral	n/a	n/a	n/a	n/a	Possible	Significant




Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Bald eagle (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 840 ha (2.3% of RSA Baseline Characterization).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by two individuals compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)<sup>(e)</sup></li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Bald eagle (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 840 ha (2.3% of RSA Baseline Characterization).</li> <li>Reduced quality of nesting and roosting habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance from RFDs but populations remain well connected.</li> <li>Possible range expansion due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Reduction in predicted abundance by two individuals compared to Base Case.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)<sup>(e)</sup></li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	nent (cont'd)	• •	- -	• •		•	-		<u> </u>
Bald eagle (Section 6.3)	Survival and reproduction	Collisions with the transmission line causing injury or mortality to bat and birds criteria	Negative	<ul> <li>Reduction in predicted abundance by two individuals compared to Baseline Characterization.</li> <li>Possible reduction in productivity of home ranges overlapping the RSA.</li> <li>Reduced survival due to collisions with electrical lines.</li> </ul>	<ul> <li>Regional (direct loss)</li> <li>Local to Regional (sensory disturbance)</li> <li>Beyond Regional (increased mortality from collision with transmission lines)<sup>(e)</sup></li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Permanent (collisions with electrical lines)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance and collisions with electrical lines)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Probable (collisions with electrical lines)</li> <li>Possible (direct loss, sensory disturbance, and natural factors)</li> </ul>	Not significant
Canada warbler (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,916 ha (5.4%) of the Corridor LSA Base Case.</li> <li>Direct loss of 5,476 ha (3.9%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Canada warbler (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of approximately 1,916 ha (5.4%) of the Corridor LSA Base Case.</li> <li>Direct loss of 5,476 ha (3.9%) of the RSA Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	Regional	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term Long-term, or Permanent (sensory disturbance</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant
	<ul> <li>Habitat availability</li> <li>Habitat distribution</li> <li>Survival and reproduction</li> </ul>	Vegetation clearing will result in an increase in edge habitat, which could increase nest predation or parasitism risk for forest breeding birds	Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance.</li> <li>Predicted abundance reduced by 55 individuals, relative to Base Case.</li> <li>Small increase in nest parasitism.</li> </ul>	<ul> <li>Regional (direct loss and nest parasitism)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss, natural factors, and nest parasitism)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss, natural factors, and nest parasitism)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ient (cont'd)			•		-	-	•	-
Eastern whip-poor-will (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by approximately 1,395 ha (7.5%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,475 (5.5%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to high mobility.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>No reduction in predicted abundance relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)			•		-		•	- -
Eastern whip-poor-will (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by approximately 1,395 ha (7.5%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,475 (5.5%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Small reduction in movements among habitat patches due to high mobility.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>No reduction in predicted abundance relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Common nighthawk (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,398 ha (7.5%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,482 ha (5.5%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by two individuals, relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)	•	-	•	-			-	-
Common nighthawk (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Suitable habitat is predicted to decrease by 1,398 ha (7.5%) in the LSA, relative to Base Case.</li> <li>Suitable habitat will decrease by 4,482 ha (5.5%) in the RSA from Base Case to RFD Case.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Probable	Not significant
	Survival and reproduction		Negative	<ul> <li>Small reduction in productivity from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by two individuals, relative to Base Case</li> <li>Magnitude depends on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term, or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environm</b>	ent (cont'd)								
Olive-sided flycatcher (Section 6.3)	Habitat availability	Site preparation, construction, operation and maintenance activities can result in the loss or alteration of vegetation and topography that may change habitat availability, use, and connectivity and influence wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 1,789 ha (5.6%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 7,114 ha (5.4%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 64 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
<b>Biological Environme</b>	ent (cont'd)								
Olive-sided flycatcher (Section 6.3)	Habitat availability	Sensory disturbance (lights, smells, noise, dust, human activity, corona-related noise, viewscape) can change wildlife habitat availability, use and connectivity (movement and behaviour), which can lead to changes in wildlife abundance and distribution	Negative	<ul> <li>Direct loss of 1,789 ha (5.6%) habitat present in the LSA at Base Case.</li> <li>Direct loss of 7,114 ha (5.4%) of suitable habitat present in the RSA at Base Case.</li> <li>Reduced quality of habitat and possible avoidance in the RSA from sensory disturbance.</li> <li>Magnitude will depend on the influences from climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	<ul> <li>Certain (direct loss)</li> <li>Probable (sensory disturbance and natural factors)</li> </ul>	Not significant
	Habitat distribution		Negative	<ul> <li>Slight shifts in territory sizes or locations due to increased human disturbance.</li> <li>Contracted distribution due to climate change.</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (direct loss and sensory disturbance)</li> <li>Frequent to Continuous (natural factors)</li> </ul>	Possible	Not significant
	Survival and reproduction		Negative	<ul> <li>Small decrease in reproductive success and survival from habitat loss and sensory disturbance</li> <li>Predicted abundance reduced by 64 individuals, relative to Base Case</li> </ul>	<ul> <li>Regional (direct loss and natural factors)</li> <li>Local to Regional (sensory disturbance)</li> </ul>	<ul> <li>Long-term to Permanent (direct loss and natural factors)</li> <li>Medium-term, Long-term or Permanent (sensory disturbance)</li> </ul>	<ul> <li>Continuous (sensory disturbance)</li> <li>Frequent to Continuous (direct loss and natural factors)</li> </ul>	Possible	Not significant
Socio-economic Env	ironment	·			•	•	•	* 	•
Archaeological resources (Section 7.1)	No net effects were identified	l for archaeological resources as a result of the Proje	ect. Consequently, the archae	ological resources criterion is not carried f	orward for assess	ment of cumulative effe	cts.		
Built Heritage and Cultural Heritage Landscapes (Section 7.2)	The magnitude of the net effe	ects was predicted to be no to negligible effect; there	fore, a cumulative effects ass	essment with future projects was not com	pleted.				
Labour Market (Section 7.3)	The predicted net effects we	re positive in direction and were therefore not carried	I forward to the cumulative eff	ects assessment.					
Regional Economy (Section 7.3)	The predicted net effects we	re positive in direction and were therefore not carried	I forward to the cumulative eff	ects assessment.					
Government Finances (Section 7.3)	The negative net effects were	e predicted to be of negligible magnitude and were the	nerefore not carried forward to	the cumulative effects assessment. The p	predicted positive	net effects were also no	ot carried forward to	the cumulative effe	ects assessment.





Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
Socio-economic Env	vironment (cont'd)								
Housing and Temporary Accommodation (Section 7.3)	<ul> <li>Population change</li> <li>Housing demand</li> <li>Housing supply</li> </ul>	Project direct construction workforce and supplier requirements could increase demand for rental housing and/or temporary accommodation, and potentially affect rental housing and/or temporary accommodation supply in certain LSA communities	Negative	Low to Moderate	Local	Reversible	Short-term	Probable	Not significant
Services and Infrastructure (Section 7.3). Includes: emergency and health services water, waste, energy infrastructure transportation	The negative net effects were	e predicted to be of negligible magnitude and were th	herefore not carried forward to	o the cumulative effects assessment.					
Community Wellbeing (Section 7.3)	Nuisance	Project construction activities could affect ambient noise levels along the ROW; potential for nuisance effects	As no RFD projects coincide on community wellbeing is ur	with cumulative effects temporal and spat ndertaken.	tial boundaries for	the Project noise asses	ssment, no cumulati	ve effects assessm	ent of nuisance noise
Parks and protected areas (Section 7.4)	The magnitude of the net effe	ect was predicted to be negligible; therefore, a cumu	lative effects assessment with	n future Projects was not completed.					
Commercial Industry Land and Resource Use (e.g., mining and aggregate, forestry, agriculture) (Section 7.4)	Resource availability	Changes in the availability of resources for the forest industry	Negative	Moderate	Regional	Long-term	Continuous	Certain	Not significant
Outdoor Tourism and Recreational Land and Resource Use (Section 7.4) assessed through consumptive and non-consumptive: hunting, Trapping, fishing and Guide Outfitting Other Outdoor Tourism and Recreation	Land Use Quantity (access)	Net changes in the quantity of land available for outdoor tourism and recreational use (i.e., access)	<ul> <li>Positive (for hunters, trappers, and non- consuming recreational land users).</li> <li>Negative (for guided outfitters and tourist operators).</li> </ul>	Moderate	Regional	Long-term	Continuous	Certain	Not significant





#### Table 11.0-3: Summary of Cumulative Effects for the for the Corridor Alternative Through Mishkeegogamang

Criteria	Indicators	Cumulative Pathway	Direction	Magnitude	Geographic Extent	Duration/ reversibility	Frequency/ timing	Probability of Occurrence	Significance
Socio-economic Env	vironment (cont'd)								
Human health (Section 7.6)	The magnitude of the net effe Section 4.6. The magnitude of the net effe projects will coincide with ten of noise on human health wa	ect on human health from changes to ambient conce ect on human health from changes to noise emissior nporal and spatial boundaries of the Project noise as s undertaken.	entrations due to CAC and fug ns during construction stage a ssessment and therefore, the	itive dust emissions was predicted to be n ctivities was predicted to be low. However human health assessment. As a result, no	egligible; therefore , based on the list further human he	e, a cumulative effects a of cumulative developn alth effects from noise a	ssessment with fut nents described in s are anticipated; ther	ure Projects was no Section 4.6, it is not efore, no cumulativ	ot completed as per expected that these e effects assessment
Visual quality (Section 7.5)	Visibility of the Project from key viewpoints	Visibility of built structures and maintenance of vegetation disturbances related to the operation of the Project can adversely affect visual quality.	Negative	Low to Moderate	Local	Permanent/Long-term	Continuous	Possible	Not significant
<b>`</b>	Compatibility of Project with existing landscape	Vegetation clearing, grading, and the assembly of built structures will introduce visible disturbances to the existing landscape that can adversely affect visual quality	Negative	Low to Moderate	Local	Permanent/Long-term	Continuous	Possible	Not significant
Aboriginal and Treaty Rights and Interests (as identified through engagement, Treaties, and other methods) (Section 8.0)	Quantity and quality of identified cultural use locations and access routes where use of or access to those locations is changed.	Site preparation, construction, operation and maintenance of the Project footprint could affect the quantity and location of access routes (i.e., increased access)	Positive and negative (traditional land and resource users)	Moderate	Local	Long-term	Continuous	Certain	Not significant

n/a = not applicable.

