**Environment and Climate Change Canada Comments on Draft Permitting Plan and Draft Tailored Impact Statement Guidelines – Federal Review Team**

**Crawford Nickel Project**

*All comments should be submitted via the Submit a Comment feature available on the Project's Canadian Impact Assessment Registry page (Reference #83857 at https://iaac-aeic.gc.ca/050/evaluations/proj/83857). Documents can be uploaded using this feature. If you have any difficulties submitting this way, please contact the registry directly at registry-registre@iaac-aeic.gc.ca. All comments submitted using this table will be posted on the Project's Registry website.*

*Please note that this will be your final opportunity to make changes to the Tailored Impact Statement Guidelines. The Agency is required to issue the final Guidelines and plans by day 180 of the Planning Phase, on April 1, 2023.*

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| Department/Agency: | Environment and Climate Change Canada (ECCC) | | |
| IA Contact: | Denise Fell | Telephone: | 647-524-1207 |
| | | Email: | denise.fell@ec.gc.ca |

**Section 1:**

1. Confirm that all applicable legislative and regulatory oversight that may apply to the Project, under the authority of your department, is accurately listed in the draft Permitting Plan.

See Table 1 - ECCC Comments on Draft Permitting Plan - Crawford Nickel Project on page 2.

2. Indicate whether your department has identified any power that it will be unable to exercise to allow the Project to proceed, in whole or in part. For more information, refer to subsection 17(1) of IAA.

ECCC had not identified any power that it will be unable to exercise at this time.

**Section 2:**

1. Comments on draft Tailored Impact Statement Guidelines (the Guidelines)

See Table 2 - ECCC Comments on Draft Tailored Impact Statement Guidelines - Crawford Nickel Project on page 8.

**Table 1 - ECCC Comments on Draft Permitting Plan - Crawford Nickel Project**

| Department – Comment ID (e.g., ECCC-01) | Permitting Plan Section | Context and Rationale (provide a clear and detailed explanation of your comments and recommendations) | Recommendation: provide text to be inserted or deleted. Be specific on the location (page, paragraph, bullet #) within the draft Permitting Plan that the text would be added/deleted. |
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| ECCC-01 | 3. Required regulatory instruments identification and justification<br>Pg. 3 | Although the likelihood of *Species at Risk Act* (SARA) permitting is low in this case, ECCC recommends including reference to SARA within the Permitting Pan and removing footnote 1 so the proponent is fully informed and aware of SARA, its application, and their responsibility. This approach is consistent with other regions and past permitting plans.<br><br>If footnote 1 is retained, ECCC has recommendations for edits to the footnote to clarify the proponent's responsibility to be aware of any new regulations or prohibition orders that may come into effect under SARA and to provide additional references. | ECCC recommends footnote 1 be deleted and reference to SARA be retained within the Permitting Plan.<br><br>If reference to SARA is not fully summarized within the body of the Permitting Plan and use of footnote 1 is instead adopted, ECCC recommends the following edits to footnote 1 (new text in bold, deleted text in strikethrough):<br><br>[1] Based on information available at the time of this Plan's publication, it is not expected that the proponent will be required to apply for a permit under the *Species at Risk Act* from Environment and Climate Change Canada (ECCC) or Fisheries and Oceans Canada (DFO). The Project is not on federal lands and there are no prohibition orders in effect on non-federal land near the Project. Any new regulations or prohibition orders affecting species at risk, their residences and critical habitat that may come into effect will be posted to the *Species at Risk Act* Public Registry (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html) and the proponent is encouraged to consult it periodically. ~~The applicable Federal Authority should notify the Agency of any prohibition orders issued for land near the Project during the impact assessment process.~~ The Proponent is also encouraged to remain familiar with all general prohibitions and permitting requirements under the *Species at Risk Act* including the Guidelines for permitting under Section 73 of SARA (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/policies-guidelines/permitting-under-section-73.html).<br><br>***Species at Risk Act*** **(S.C. 2002, c. 29)**<br>**https://laws-lois.justice.gc.ca/eng/acts/S-15.3/**<br><br>**Protection Statement for the habitat to which the *Migratory Birds Convention Act, 1994* applies for Migratory Birds under SARA**<br>**https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/critical-habitat-statements/protection-statement-habitat-mbca-1994-applies-migratory-birds-listed-under-sara.html**<br><br>**Residence Description/Rationales**<br>**https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/residence-descriptions.html** |

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| ECCC-02 | 3. Required regulatory instruments identification and justification<br>Pg. 4 | ECCC recommends addition of a new section 3.4 Authorizations under subsection 73(1) of the *Species at Risk Act* using text from the January 20, 2023 version of the Draft Permitting Plan. Retaining information on SARA in the Permitting Plan will ensure the proponent is fully aware of their responsibilities under SARA and result in consistency across other permitting plans. | ECCC recommends the following new text be added to page 4:<br><br>3.4 Authorizations under subsection 73(1) of the *Species at Risk Act*<br><br>Based on the information available regarding the Project's activities at the time of this plan's publication, it is not expected that the Proponent will be required to apply for a permit under the *Species at Risk Act* (SARA) from Environment and Climate Change Canada (ECCC) or Fisheries and Oceans Canada (DFO).<br><br>The Detailed Project Description notes that the Project is not on federal lands. There are no prohibition orders in effect on non-federal land near the Project. Any new regulations or orders affecting species at risk, their residences and critical habitat that may come into effect will be posted on the SARA Public Registry website. The Proponent is encouraged to consult the SARA Public Registry periodically. |
| ECCC-03 | 4. Information on required regulatory instruments<br>Pg. 14 | ECCC recommends addition of a new section 4.4 Permit under subsection 73(1) of the *Species at Risk Act* using text from the January 20, 2023 version of the Draft Permitting Plan. Retaining this text will ensure the proponent is aware of potential legal and regulatory requirements. This recommendation is consistent with other permitting plans where SARA permitting requirements were low. | ECCC recommends the following new text be added to page 14:<br><br>4.4 Permit under subsection 73(1) *of the Species at Risk Act*<br><br>4.4.1 Description<br><br>Permits are required by those persons conducting activities affecting wildlife species listed on Schedule 1 of SARA as extirpated, endangered, or threatened and which contravene SARA's prohibitions where they are in force.<br><br>4.4.1.1 General Prohibitions<br><br>Pursuant to sections 32 and 33 of SARA (general prohibitions), it is prohibited to:<br>• kill, harm, harass, capture or take an individual of a species listed under SARA as extirpated, endangered or threatened;<br>• possess, collect, buy, sell or trade an individual of a species listed under SARA as extirpated, endangered or threatened, or any part or derivative of such an individual; and<br>• damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada.<br><br>The general prohibitions apply to federal species (migratory birds, as defined by the *Migratory Birds Convention Act, 1994*, and aquatic species covered by the *Fisheries Act*) everywhere in Canada and to other listed species where found on federal land.<br><br>Under sections 34-35 and 80 of SARA, general or specific prohibitions relative to individuals and residences may apply on lands other than federal lands for species that are not aquatic species or migratory birds protected under the *Migratory Birds Convention Act*, *1994* under an Order in Council. |

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| | | | 4.4.1.2 Critical Habitat Prohibitions<br><br>Under subsections 58(1) and 61(1) of SARA, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species — or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.<br><br>The Act requires that critical habitat on federal lands, or for aquatic species anywhere, be legally protected. A ministerial Order may be used to bring the SARA prohibitions relative to critical habitat into force in these circumstances.<br><br>Under sections 61 and 80 of SARA, prohibitions relative to critical habitat may apply on non-federal lands under an Order in Council.<br><br>4.4.1.3 Applicable situations<br><br>Under section 73, the competent minister may enter into an agreement or issue a permit authorizing a person to engage in an activity affecting any listed endangered, threatened or extirpated species, any part of its critical habitat, or the residences of its individuals, if the proposed activity falls under one or more of the following purposes:<br>• the activity is scientific research relating to the conservation of the species and conducted by qualified persons;<br>• the activity benefits the species or is required to enhance its chance of survival in the wild; or<br>• affecting the species is incidental to the carrying out of the activity.<br><br>4.4.1.4 Responsibilities<br><br>Responsibility for implementing SARA lies with the Ministers responsible for DFO, Parks Canada Agency (PCA) and ECCC.<br>• DFO is responsible for considering permit applications with respect to aquatic species (as defined by SARA), other than individuals of species in the waters situated on federal lands administered by the PCA. An “aquatic species” under SARA includes:<br>o fish, shellfish, crustaceans and marine animals including any parts thereof;<br>o all of their life stages, such as eggs, sperm, spawn, larvae, spat and juvenile stages of fish; and<br>o marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton.<br>• PCA is responsible for considering permit applications with respect to individuals in or on federal lands administered by PCA, including aquatic species (as defined by SARA) as well as terrestrial species.<br>• ECCC is responsible for considering permit applications with respect to all individuals that are not under the responsibility of PCA or DFO. This includes all terrestrial species on federal land and any land affected by a protection order issued under SARA, and for migratory birds wherever they are found. |

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| | | | If a competent department issues an authorization, licence or permit under another federal Act, authorizing a person or organization to engage in an activity affecting a listed wildlife species, any part of its critical habitat or the residences of its individuals, this authorization, licence or permit can act as a SARA permit, provided that the competent minister is of the opinion that the requirements of subsections 73(2) to (6.1) are met and complies with the requirements of subsection 73(7).<br><br>4.4.2 Regulatory process<br><br>Proponents must submit an application to the DFO, ECCC or PCA Regional Office in a manner and form satisfactory to these organizations.<br><br>4.4.2.1 Application submission for an aquatic species at risk<br><br>To seek a permit under SARA from DFO, the Proponent must submit an application to the relevant regional office of the Fish and Fish Habitat Protection Program (refer to section A.1.4 of the Permitting Plan for contact information). The timing of when the application is submitted is determined by the Proponent. If the Proponent is also seeking a *Fisheries Act* authorization, the process to apply for a SARA permit can be combined with the process to seek a *Fisheries Act* authorization.<br><br>4.4.2.2 Application submission for a terrestrial species at risk<br><br>To obtain a permit from ECCC, proponents must submit an application using the Species at Risk Permit System found on the Species at Risk Public Registry and provide the required information detailed in the application.<br><br>4.4.2.3 Application analysis and consultation<br><br>An analysis of the application is conducted by ECCC, PCA or DFO upon receipt of the application, although there may be occasions when the competent minister will require additional information. A focus of the analysis is on how the application meets the pre-conditions listed under subsection 73(3) of SARA. Authorizations may be issued only if the competent minister is of the opinion that all three of the following pre-conditions are met:<br>• all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted;<br>• all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and<br>• the activity will not jeopardize the survival or recovery of the species. |

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| | | | During this analysis stage, and before the regulatory decision, ECCC, PCA or DFO may undertake additional Indigenous consultations, as required under subsections 73(4) and 73(5) or SARA.<br><br>4.4.2.4 Regulatory decision<br><br>The *Permits Authorizing an Activity Affecting Listed Wildlife Species Regulations* specify that the competent minister must issue a permit or notify the applicant that the permit has been refused within 90 days following the receipt of the application. This time limit is suspended if the application is incomplete and the applicant is notified. The time limit suspension ends when all the information is received from the applicant.<br><br>The Regulations also specify that the 90-day time limit does not apply in the following circumstances:<br>• additional consultations are necessary, including consultations with wildlife management boards and bands under the *Indian Act* which are required by subsections 73(4) and (5) of SARA;<br>• another Act of Parliament or land claims agreement requires that a decision be made before the competent minister issues or refuses to issue a permit;<br>• the terms and conditions of a permit previously issued to the applicant have not been met;<br>• the applicant requests or agrees that the time limit not apply; or<br>• the activity described in the permit application is modified before the permit is issued or refused.<br><br>For activities requiring a decision under the the IAA, permit applications are not subject to the 90-day timeline because another Act of Parliament requires that a decision be made before the competent minister issues or refuses to issue a SARA permit. These applications can be reviewed concurrently with the impact assessment to facilitate alignment of the authorization securing processes.<br><br>If fauna and flora surveys are necessary to obtain more baseline information about SARA listed species at risk that may be impacted by a project, SARA permits may be required if these surveys affect individuals of species, their residence or critical habitat (e.g. if they require capture, handling, fencing, baiting, disturbing of normal behaviour, etc.). Permit applications for these fauna and flora surveys are not subject to the 90-day timeline exception provided for an IAA decision related permit, but may be subject to other regulated exceptions.<br><br>It is the proponent's responsibility to identify and carry out all species at risk surveys necessary to support the permit application and review, and to monitor for additional species being listed during the planning of their Project. Proponents are invited to consult on survey plans as early as possible in the planning process with the Canadian Wildlife Service within Environment and Climate Change Canada by email at wildlifeontario@ec.gc.ca<br><br>4.4.3 References |

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| | | | *Species at Risk Act* (S.C. 2002, c. 29)<br>https://laws-lois.justice.gc.ca/eng/acts/S-15.3/<br><br>*Permits Authorizing an Activity Affecting Listed Wildlife Species Regulations*<br>https://laws-lois.justice.gc.ca/eng/regulations/SOR-2013-140/index.html<br><br>Permitting for aquatic species at risk under SARA<br>https://www.dfo-mpo.gc.ca/species-especes/sara-lep/permits-permis/index-eng.html<br><br>Permitting for terrestrial species at risk under SARA<br>https://splep-saraps.az.ec.gc.ca/<br><br>Species at Risk Public Registry<br>https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html<br><br>Guidelines for permitting under Section 73 of SARA<br>https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/policies-guidelines/permitting-under-section-73.html<br><br>Protection Statement for the habitat to which the *Migratory Birds Convention Act, 1994* applies for Migratory Birds under SARA<br>https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/critical-habitat-statements/protection-statement-habitat-mbca-1994-applies-migratory-birds-listed-under-sara.html<br><br>Residence Description/Rationales<br>https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/residence-descriptions.html<br><br>4.4.4 Contact Information<br><br>For more detailed guidance on the Species at Risk permitting process, please contact the regional Environment and Climate Change Canada office:<br><br>Canadian Wildlife Service, Ontario Region<br>Environment and Climate Change Canada<br>Email: wildlifeontario@ec.gc.ca |

**Table 2 - ECCC Comments on Draft Tailored Impact Statement Guidelines (TISG) - Crawford Nickel Project**

| Department – Comment ID (e.g., ECCC-01) | Draft Guidelines Section | Context and Rationale (provide a clear and detailed explanation of your comments and recommendations) | Recommendation: provide text to be inserted or deleted. Be specific on the location (page, paragraph, bullet #) within the draft Guidelines that the text would be added/deleted. |
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| **3. Project description** | | | |
| ECCC-01 | Section 3.3 Regulatory framework and the role of government Pg. 10 | Section 3.3 should reference the Strategic Assessment of Climate Change (SACC) Technical Guide's guidance on quantification of net greenhouse gas emissions, impacts on carbon sinks, mitigation measures, net-zero plan, and upstream greenhouse gas assessment. The proponent should also be required to identify the implications of greenhouse gas legislations, policies and regulations on the project. | ECCC recommends the following edits to bullet point 1 (new text in bold):<br><br>• federal, provincial or territorial greenhouse gas (GHG) legislation, policies or regulations that will apply to the Project, **and explain their implications** in accordance with the Strategic Assessment of Climate Change (SACC) **and section 3.4.5 of the associated Technical Guide**; |
| ECCC-02 | 3.4 Project components and activities Pg. 10 | Sufficient details are required to support analysis regarding the projects impacts on valued components as well as in the context of potential interactions between valued components. | ECCC recommends the following edits to bullet point 6:<br><br>• provide sufficient detail to support analysis regarding the Project's impacts **on valued components and** in the context of potential interaction between valued components (VC); |
| ECCC-03 | 3.4. Project components and activities Pg. 11 | The requirements are inconsistent in how they refer to how the project components must be described. The footprint and location should be required for all components. | ECCC recommends the following edits to the bullet points under paragraph 2:<br><br>• storage and load out facilities for concentrate **(footprint, location)**;<br>• fuelling stations for trucks/vehicles or energy supply source (e.g. generators) **(footprint, location)**;<br>• Explosives storage (method, **footprint**, location, licensing, management);<br>• Construction workspace and laydown areas **(footprint, location)**;<br>• Temporary or permanent infrastructure, including administrative buildings, warehouse, garages, maintenance offices, parking areas **(footprint, location)**;<br>• Temporary or permanent energy supply sources **(footprint, location);**<br>• Fences and barriers **(type, location)**; and<br>• Any other infrastructure relevant to the Project **(including footprint, location, etc.).** |

| 7. Assessment methodology | | | |
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| ECCC-04 | 7.2 Selection of Valued Components<br>Pg. 30 | Section 7.2 specifically identifies the small lakes near the tailings facility that are within the Jocko Creek watershed as valued components to be considered in the assessment, however there may be additional waterbodies and watercourses near the tailings management facility that may be affected. ECCC recommends the requirements instead specify that the water quality assessment include all waterbodies and watercourses in all watersheds potentially affected by the Project, to ensure no watersheds or bodies of water are excluded from the assessment. | ECCC recommends the following edits to bullet points 3—5 following paragraph 2 (new text in bold, deleted text in strikethrough):<br><br>• Water quality and flows **of all potentially affected water bodies and watercourses**, including:<br>o Mattagami River, North Driftwood River, West Buskegau River, **Jocko Creek**, and their tributaries;<br>o ~~small lakes near the tailings management facility~~ |
| ECCC-05 | 7.2. Selection of valued components<br>Pg. 30 | Species at Risk:<br><br>The potential and residual impacts, particularly those related to habitat loss, should be assessed for each of the species at risk likely to be present. ECCC is of the opinion that each potentially impacted species at risk listed under the *Species at Risk Act* (SARA) be the subject of a separate impact analysis to account for distribution, abundance, behaviour, habitat use and threats or issues.<br><br>This requirement is necessary to ensure consistency with section 79 of SARA: to determine the potential adverse effects on the listed species and its critical habitat (including any plant species) and, if the project is carried out, to ensure that that measures are taken to avoid or lessen these effects and to control them, and ensure that these measures are compatible with any recovery strategy and any applicable action plan. | ECCC recommends the following edits to bullet point 10 and new bullet points to be added under it, following the text: " Based on comments from participants during the Planning Phase, the following components have been raised as important to consider in the assessment, but it is not exhaustive"(new text in bold, deleted text in strikethrough):<br><br>• species at risk **listed under the Federal *Species at Risk Act*** including caribou (boreal population; commonly referred to as boreal caribou) ~~habitat recovery goals~~, bats, and birds, **and habitat recovery goals;**<br>• **migratory birds listed under the MBCA and non migratory birds, including;**<br>o **raptors, such as, hawks, eagles, falcons;**<br>o **waterfowl, such as, ducks, geese, swans;**<br>o **waterbirds, such as, loons, gulls, terns;**<br>o **marshbirds, such as, grebes, rails, herons, cranes;**<br>o **shorebirds, such as, sandpipers, plovers, snipes;**<br>o **forest birds, such as, warblers, vireos, thrushes;**<br>o **other land birds, such as, owls, swallows, kingfishers;** |

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| | | This requirement should apply to species at risk listed in Schedule 1 of SARA and those that have a special status according to the COSEWIC assessment.<br><br>Birds:<br><br>Birds are not included in the list of components to be considered in the Assessment. Migratory Birds listed under the *Migratory Birds Convention Act* (MBCA) are a component of interest to ECCC. Non-migratory birds have also been included as it is ECCC understanding they are of interest to other stakeholders. | |
| ECCC-06 | 7.4 Effects assessment methodology<br>Pg. 34 | The TISG requirement to describe analytical methods to assess effects and provide assumptions does not require explanation of the criteria or descriptors used. | ECCC recommends the following edits to bullet point 5 (new text in bold):<br><br>• describe the analytical methods selected to assess effects, including clearly stated assumptions for all predictions and how each assumption has been tested**, and provide clear definitions of any criteria or descriptors used;** |
| ECCC-07 | 7.4. Effects assessment methodology<br>Pg. 34 | The TISG requires a discussion of how the range of potential climates informed the assessment, including predicted changes in climate extremes. These are climate change projections not predictions. | ECCC recommends the following edits to bullet point 10 (new text in bold, deleted text in strikethrough):<br><br>• for predictions that may be affected by climate change, discuss how the range of potential climates informed the assessment, including **projected**~~predicted~~ changes in climate extremes; |
| ECCC-08 | 7.7. Extent to which effects are significant<br>Pg. 40 | ECCC recommends some edits to clarify that this applies to both qualitative and quantitative criteria. | ECCC recommends the following edits to bullet point 17 (new text in bold):<br><br>• justify the approach and choice of **qualitative or quantitative** criteria **(e.g. categories, benchmarks, thresholds, or other descriptors)** used to determine the extent to which the effects are significant |
| **8. Biophysical environment** | | | |
| ECCC-09 | 8. Biophysical environment<br>Pg. 41 | References to data sources for watershed boundaries and wetlands will ensure best available data is used and allow for consistency in the definition of boundaries across the project. | ECCC recommends the following edits to bullet points 1 and 3 after paragraph 2 (new text in bold):<br><br>• primary, secondary and tertiary watersheds **as per the province's** Ontario Watershed Boundaries;<br>• wetlands **as per the province's** Ontario Land Cover Compilation v2.0; and |
| **8.5. Atmospheric, acoustic, and visual environment** | | | |
| ECCC-10 | 8.5.1 Baseline Conditions<br>Pg. 45 | Section 8.5.1 of the TISG requires the collection of baseline ambient air concentrations for contaminants and a quantification of emission | ECCC recommends the following edits to bullet point 2 (deleted text in strikethrough): |

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| | | sources for all phases of the Project. Section 8.5.2 requires the proponent to provide a detailed description of emission sources of air pollutants from all phases of the Project listed under section 8.5.1 as well as non-project emission sources on pollutant concentrations at key receptors.<br><br>Baseline concentrations represent pre-project conditions. It is unclear how or why the proponent is being required to provide baseline concentration conditions during each phase of the project as part of Section 8.5.1.<br><br>It is also unclear why there is a requirement to provide both baseline ambient air concentrations and emission sources, or how this can be accomplished, particular considering that there are some substances on the list such as ozone and secondary PM2.5 whose sources cannot be identified by the proponent as they are not emitted at point source locations. | • provide baseline ambient air concentrations for contaminants ~~for all phases of the Project~~, in particular near key receptors (e.g., communities, traditional land users, wildlife) ~~and quantify emission sources~~ for the following: |
| ECCC-11 | 8.5.2 Effects to the atmospheric, acoustic, and visual environment<br>Pg. 47 | Modelling assessments require the identification of the domain where air quality impacts will be assessed. The size of modelling domain is dependent on the sources of emissions and the distance to receptors of interest.<br><br>It is important the model domain be large enough to identify potential ambient air concentrations in the areas where sensitive receptors are located. | ECCC recommends the following edits to bullet point 6 (new text in bold, delete text in strikethrough):<br><br>• use atmospheric dispersion modelling to predict the fate of emissions resulting from project-related sources and ~~provide~~ **be carried out using a domain that is sized sufficiently to identify potential air quality impacts on all sensitive receptors, and is presented using** appropriately scaled contour map(s)[13] plotting the predicted ambient concentrations (see Appendix 1 - Additional guidance for biophysical components for guidance on dispersion modelling); |
| ECCC-12 | 8.5.2 Effects to the atmospheric, acoustic, and visual environment | The TISG requirements include providing a detailed methodology and assumptions used to estimate emissions of air pollutants released. The TISG does not provide guidance to ensure assumptions are valid and are not used to | ECCC recommends addition of the following new sub-bullet point under bullet point 2 as follows:<br><br>o Perform dispersion modeling, including worst case scenarios, for all project phases. |

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| | Pg. 47 | incorrectly justify excluding project phases from further assessment.<br><br>For example, there may be a false assumption that the operations phase has the highest air quality impacts for all air pollutants without consideration of the potential for higher short-term exceedances of some air pollutants such as NOx and particulate matter during the construction phase. | |
| ECCC-13 | 8.5.2 Effects to the atmospheric, acoustic, and visual environment<br>Pg. 48 | Dust or particulate matter emissions from unpaved roads (haulage) may represent 75% to 80% of all particulate matter emissions. Commonly used mitigation measures, such as water spraying, have varying efficiencies that may not be uniform or consistent over time. Furthermore, models can use unrealistic control efficiencies (as high as 98%), inducing unrealistic modeled concentrations.<br><br>The requirement in the TISG to "provide justification for all control efficiencies used to reduce emission rates of sources within the model, including details of all assumptions associated with the related mitigation measures, and their achievability", allows for the modeling of the best case scenario with optimally functioning mitigation measures. Taking into account the above concerns, it should be specified in the requirements that modeling be conducted with and without emission control measures to provide more realistic results and a more accurate understanding of potential adverse effects of particulate matter emissions.<br><br>Sources of uncertainty in modeled air pollutant concentrations listed in bullet point 5 on page 48 include uncertainty in baseline concentration, | ECCC recommends addition of the following new bullet point:<br><br>• Model particulate matter emissions from unpaved road dust both with and without implementation of mitigation measures during the construction and operation phases. Mitigation measures with varying control efficiency scenarios should be modeled such as 50% and 70% control efficiency.<br><br>ECCC recommends the following edits to bullet point 5 (new text in bold):<br><br>• uncertainty in baseline concentration estimates, in the estimates of meteorological inputs, and in estimates of source emissions **and control efficiencies** (from sources attributable to the Project, and externally); |

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| | | meteorological, and source emission estimates, but do not include uncertainties associated with control efficiencies. | |
| **8.6. Groundwater and surface water** | | | |
| ECCC-14 | 8.6.1 Baseline Conditions<br>Pg. 51 | The list of all waterbodies and watercourse that may be directly or indirectly affected by the Project contains examples of watercourses. It will be more inclusive to refer to generic watercourses and waterbodies, rather than provide some examples. | ECCC recommends the following edits to bullet point 5 (new text in bold, deleted text in strikethrough):<br><br>• type of watercourse **or waterbody** impacted; and ~~(e.g., lotic or lentic system, lake, river, pond, temporary or permanent stream);~~ |
| ECCC-15 | 8.6.1 Baseline Conditions<br>Pg. 53 | The list of waterbodies and watercourses to be assessed using the conceptual model for the hydrological environment contains a subset of types. It will be more inclusive to simply refer to all waterbodies and watercourses (permanent and temporary), rather than name a subset of types, unless there is a reason to exclude any particular types. | ECCC recommends the following edits to bullet point 14 (new text in bold):<br><br>• present a conceptual model for the hydrological environment, as appropriate to describe baseline conditions for surface waters. The model should be developed to support the assessment of potential changes to water and sediment quantity and quality in **watercourses, waterbodies** and wetlands, with input from regulators and Indigenous communities; and |
| **8.7. Vegetation, riparian and wetland environments** | | | |
| ECCC-16 | 8.7.1. Baseline conditions<br>Pg. 59 | The list of wetland classes provided in the TISG only includes three of the five classes of wetland recognized by the National Wetlands Working Group. | ECCC recommends the following edits to bullet 9 (new text in bold):<br><br>• use the *Ontario Land Cover Compilation v.2.0* to quantify, describe and map wetlands (e.g **shallow open waters, swamps**, fens, marshes, bogs) within the local and regional study area potentially affected by the Project, in the context of: |
| ECCC-17 | 8.7.1. Baseline conditions<br>Pg. 60 | ECCC has a mandate and interest related to both species at risk and migratory birds. The TISG requires wetland habitat that provides important functions for species at risk to be considered when quantifying, describing and mapping wetlands, but it does not require migratory birds to be considered. | ECCC recommends the following edits to bullet point 3 (new text in bold):<br><br>• wetland habitat that provides important functions for **migratory birds**, species at risk and species of importance to Indigenous Peoples; |
| ECCC-18 | 8.7.1 Baseline conditions<br>Pg. 60 | There is redundancy in the requirements related to provision of a wetland functions assessment. Bullet point 10 requires a wetland functions assessment and bullet point 9 requires the same thing with some additional language on what a wetland functions assessment is intended to | ECCC recommends removing bullet 9 (deleted text in strikethrough):<br><br>• ~~identify and describe wetland capacities to perform hydrological and water quality functions, provide for wildlife and wildlife habitat or other ecological functions;~~ |

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| | | cover. This bullet point has been removed from other recent TISGs. | |
| ECCC-19 | 8.7.1 Baseline conditions<br>Pg. 60 | ECCC recommends editing this requirement for more direction and consistency with Appendix 1, Baseline Conditions, Wetlands. | ECCC recommends the following edits to bullet point 12 (new text in bold, deleted text in strikethrough):<br><br>• determine if other wetland conservation policies, regulations or wetland compensation guidelines apply (contact provincial and/or local government authorities). **See also resources available from The Wetland Network**; |
| ECCC-20 | 8.7.1 Baseline conditions<br>Pg. 60 | Wetland form and function are largely dictated by hydrology, therefore direct effects to wetland form and function at one area of a catchment will have impacts to wetland functions downstream, due to hydrological connectivity between ecosystems. It is recommended the study areas include all areas where potential project effects extend. | ECCC recommends the addition of the following new bullet points be added above and below bullet point 13 (new text in bold):<br><br>• **identify a local study area that takes into account watershed area and hydrological connectively of wetlands within or bisected by the project area;**<br>• identify a regional study area of sufficient size to capture effects to wetlands within the larger drainage area and include wetlands located outside of the local study area that may be affected by hydrological changes as a result of cumulative effect; |
| ECCC-21 | 8.7.2 Effects to vegetation, riparian and wetland environments<br>Pg. 60 | It is important to require a rationale for the selection of key indicators, as has been done in other TISGs. | ECCC recommends the following edits to bullet point 2 (new text in bold):<br><br>• describe the key indicators used to assess project effects and the sensitivity of vegetation communities, wetlands, and riparian and terrestrial environments to disturbance. **Provide a rationale for their selection, including a clear connection to indicators used to characterize baseline conditions**; |
| ECCC-22 | 8.7.2 Effects to vegetation, riparian and wetland environments<br>Pg. 61 | ECCC recommends adding requirements related to existing baseline conditions to provide better continuity and connection between existing baseline conditions requirements and the effects assessment. This will allow for a clear comparison of the baseline conditions and estimated conditions with and without the project. | ECCC recommends the following new bullet points be added after bullet point 1:<br><br>• quantify the area of vegetation communities, riparian, wetland, and terrestrial environments, that may be cleared or otherwise disturbed within the study area during all phases of the Project, including a description of the disturbance and changes to:<br>o interior to edge habitat ratios;<br>o the availability of rare habitat;<br>o functions within the remaining vegetation or wetland complex;<br><br>ECCC recommends the following new bullet points be added after bullet point 2:<br><br>• describe changes related to landscape disturbance, including loss and fragmentation of habitats, alteration of riparian areas, including buffers or setbacks and project effects on areas of soil or ground instability;<br>• describe effects related to potential introduction of weed species or invasive species or due to the increase in the spread and prevalence of diseases or pests; |

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| | | | ECCC recommends the following new bullet points be added after bullet point 4:<br><br>• describe potential effects from project emissions that may result in contamination and acidification of nearby land and waterbodies, including consideration of the sensitivity of vegetation communities, wetlands, and riparian and terrestrial environments to disturbance;<br>• describe potential changes to riparian, wetland and terrestrial environments due to activities that may affect topography, soil erosion, compaction, and productivity, contamination, bank slopes and suspension of sediment or due to any contaminants of concern potentially associated with the Project that may affect vegetation, soil, sediment or water; and<br>• describe any known or suspected soil contamination within the local study area that could be re-suspended, released or otherwise disturbed as a result of the Project. |
| **8.9. Birds, migratory birds and their habitat** | | | |
| ECCC-23 | 8.9.1. Baseline conditions<br>Pg. 69 | ECCC recommends adding new requirements to ensure the bird baseline conditions section is consistent with the baseline conditions sections for other VCs.<br><br>Existing data concerning birds are unlikely to provide a sufficient basis for supporting baseline characterizations that reliably describe bird occurrence and distribution spatially and temporally. Insufficient, out of date, and access-biased or otherwise unrepresentative data may impair decisions about data sufficiency, baseline conditions and impact projection estimates. Survey data collected from recent well-designed surveys, augmented with existing data, are more likely to support a representative baseline condition.<br><br>Narrowing the focus of an impact statement to focal species or groups of species may lead to incorrect assessment of impacts to a particular species and generate incorrect decisions. Individual species will vary in their distribution, | ECCC recommends the following new bullet points be added:<br><br>• **provide up to date baseline studies that are reliable representations of current conditions relating to migratory and non-migratory birds and their habitat;**<br>• **provide justification and documentation where desktop analysis is used in place of baseline studies. Documentation should include statistical analyses and simulations showing how additional studies would make little or no improvement to knowledge inputs to decisions or assessment of impacts;**<br><br>ECCC recommends the following edits to bullet points 1-9 and new bullet points after bullet point 9 (new text in bold, deleted text in strikethrough):<br><br>• identify species or groups that may be affected differently by the Project and may require different mitigation measures, **and, where possible, avoid collapsing data into diversity metrics or narrowing to an indicator species**;<br>• the following groupings should be considered as unique VCs with rationale provided where groups are not included as unique VCs:<br>o ~~waterfowl such as ducks and geese;~~<br>o ~~land birds, including songbirds;~~<br>o ~~raptors, such as bald eagles and osprey;~~<br>o ~~marsh birds including rails;~~<br>o ~~water birds;~~<br>o ~~shorebirds;~~<br>o ~~other land birds;~~<br>o **raptors, such as, hawks, eagles, falcons;** |

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| | | abundance, behaviour, and habitat use even within groups of closely related species.<br><br>ECCC has recommended updating the TISG to use standardized bird groupings to consider as VCs for this project. | o **waterfowl, such as, ducks, geese, swans;**<br>o **waterbirds, such as, loons, gulls, terns;**<br>o **marshbirds, such as, grebes, rails, herons, cranes;**<br>o **shorebirds, such as sandpipers, plovers, snipes;**<br>o **forest birds, such as warblers, vireos, thrushes;**<br>o **other land birds, such as, owls, swallows, kingfishers;**<br>o **identified avian species at risk under federal or provincial jurisdiction;** |
| ECCC-24 | 8.9.1. Baseline conditions<br>Pg. 70 | Metrics and indicators need to characterize more than just biodiversity. | ECCC recommends the following edits to the first bullet point (new text in bold, deleted text in strikethrough):<br><br>• identify the ~~biodiversity~~ metrics~~,~~ **and** biotic and abiotic indicators that are used to characterize the baseline **conditions** ~~avifauna biodiversity~~ and discuss the rationale for their selection; |
| ECCC-25 | 8.9.1. Baseline conditions<br>Pg. 70 | From the information provided in the Detailed Project Description it seems likely that existing data assembled via a desktop exercise will not be sufficient to characterize a baseline and additional baseline studies will be required.<br><br>It is important that the proponent demonstrate the sufficiency of data used to ensure a sufficient basis for a proper characterization of baseline and that there be a clear expectation for when additional baseline studies are required. | ECCC recommends the following edits to bullet points 2-6 (new text in bold, deleted text in strikethrough):<br><br>• for the bird species and groups listed above and for any other bird species or groups that **use the local study project area at any time of year** that are likely to be affected, describe their:<br>o abundance **(including relative abundance in each habitat type)**, population status, and distribution (reliance on ~~from~~ desktop analysis should be well justified and demonstrated to support ~~supplemented by field data as necessary to build confidence in general~~ **reliable analysis, results and** conclusions**, and supplemented by field data as necessary to build confidence**);<br>o life cycle, seasonal ranges, migration, movements;<br>o frequency and timing of occurrence;<br>o **seasonal and annual variation in abundance, distribution and habitat use**;<br>o habitat association(s) and requirements for all relevant life cycle stages; and<br>o sensitive periods (e.g. seasonal, time of day); |
| ECCC-26 | 8.9.1. Baseline conditions<br>Pg. 70 | Recommend the proponent be required to demonstrate that any existing data used is sufficient and additional field surveys are not required. | ECCC recommends the following edits to bullet point 8 (new text in bold, deleted text in strikethrough:<br><br>• describe and map the habitat and habitat features found in the project area, local study area and regional study areas that are associated with the presence of those bird species and groups that are likely to be affected, based on the best available existing information (e.g., land cover types, vegetation) supplemented by field data **as** ~~if~~ necessary to **enable demonstration of sufficient data for baseline characterization and** build confidence in assumptions. **S**hould there be anticipated displacement of nesting birds, baseline habitat data should provide evidence that there is enough equivalent habitat for birds to be displaced to and that the habitat being removed is not unique to the project study area; |
| ECCC-27 | 8.9.1. Baseline conditions | Consideration of bird use of the project area through the seasons is necessary to characterize | ECCC recommends the following addition under the 3rd major bullet on page 70 of section 8.9.1: |

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| | Pg. 70 | baseline conditions. Although loss or impairment of breeding habitat is ecologically important, the same is true for locations and habitat types necessary for birds during the migration and over-wintering periods. | • **provide an estimate of year-round bird use of the local study area (e.g. winter, spring migration, breeding season, fall migration), based on data from existing sources and surveys to provide current field data if required to generate reliable estimates.** |
| ECCC-28 | 8.9.1. Baseline conditions<br>Pg. 70 | Adjusted wording to align with other recent TISG requirements. These will assist with understanding baseline conditions of avian species at risk that are present within the study areas.<br><br>This requirement is necessary to ensure consistency with section 79 of SARA: to determine the potential adverse effects on the listed species and its critical habitat (including any plant species) and, if the project is carried out, to ensure that that measures are taken to avoid or lessen these effects and to control them, and ensure that these measures are compatible with any recovery strategy and any applicable action plan.<br><br>This requirement should apply to species at risk listed in Schedule 1 of SARA and those that have a special status according to the COSEWIC assessment. | ECCC recommends the following the edits to bullet point 9 (new text in bold, deleted text in strikethrough):<br><br>• for avian species at risk ~~that are listed as threatened or endangered~~, locate on an appropriately scaled map the potential habitats, survey locations, records of the species, residences and critical habitat, except where locations and records are considered sensitive information;<br>o **identify federal species at risk/or Critical Habitat in the project area;**<br>o **identify migratory birds listed under the *Species at Risk Act* to which the *Species at Risk Protection Statement* applies (see Appendix 2);**<br>o **identify provincial species at risk;**<br>o **identify any species assessed as at risk by the Committee on the Status of Endangered Wildlife in Canada;**<br>o **identify any sites that are likely to be sensitive locations and habitat for birds or environmentally specific areas. This include National Parks, Areas of Natural and Scientific Interest, Migratory Bird Sanctuaries or other priority areas or sanctuaries for birds, National Wildlife Areas or World Biosphere Reserves;**<br>o illustrate on the map the Project's footprint, identifying temporary and permanent infrastructure;<br>o locate the highest concentrations or areas of use by species; |
| ECCC-29 | 8.9.1 Baseline Conditions<br>Pg. 70 | If modelling is not used as a part of the analysis then a rationale is not required, but if it is then a rationale should be provided. | ECCC recommends the following edits to bullet point 12 (new text in bold, deleted text in strikethrough):<br><br>• describe the source of the data, data collection methods, and provide a rationale for **chosen** ~~any~~ analysis and modelling approaches ~~chosen~~ (see Appendix 1 – Additional Guidance for Biophysical components for more guidance on collecting baseline data); |
| ECCC-30 | 8.9.1. Baseline conditions<br>Pg. 70 | Adjusted wording to ensure a demonstration that data is sufficient and collected using a method that represents variation in birds across space or time (per section 7.1). | ECCC recommends the following edits to bullet point 13 (new text in bold, deleted text in strikethrough):<br><br>• where predictive modelling is~~ required~~ **used to portray baseline conditions and estimates of the project effects**, provide the explanatory data (e.g., ~~covariables~~ **covariates** such as associated land cover~~, etc.~~) ~~required to predict effects on birds (e.g., changes in abundance, **density**, distribution or other relevant effects).~~ Explanatory data should be shown to be sufficient for ~~collected in such as way as to~~ represent**ing** the following sources of variation where |

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| | | | applicable: spatial variation in land cover composition, soil type, geomorphology, hydrological processes, and inter-annual and intra-annual climate variability. |
| ECCC-31 | 8.9.2 Effects to birds, migratory birds and their habitat<br>Pg. 71 | This requirement is very similar to the one directly below it that reads: "Describe short and long term changes to habitat important for breeding, foraging, migration overwintering, etc." These habitats would fall under this requirement, so this requirement is redundant. | ECCC recommends deleting bullet point 8:<br><br>• ~~describe short term and long term changes to habitats, including: forests, riparian zones, grasslands, old-growth forests, wetlands, eskers and other similar geological formations, and open waters;~~ |
| ECCC-32 | 8.9.2 Effects to birds, migratory birds and their habitat<br>Pg. 71 | Increased clarity by expanding on potential impacts from the project on birds. | ECCC recommends the following edits to bullet points 10-12 (new text in bold):<br><br>• describe the potential effects of the Project on birds (migratory and non-migratory birds), their nests and eggs, including, but not limited to, from:<br>o **short and long-term** changes to habitats important for breeding ~~nesting~~, foraging, migration ~~staging~~, overwintering, rearing and moulting and to movement corridors between habitat, and from habitat loss, fragmentation and structural change; ~~and~~<br>o **changes in biodiversity, abundance and density of the avian community that utilize various habitat types or ecosystems;**<br>o changes to mortality risk, including as a result of collision of birds (migratory and non-migratory) with project infrastructure, buildings, overhead lines, vehicles, railway operations, as a result of light attraction and from indirect effects, such as increased movement of predators or access to hunting;<br>o **increased disturbance (e.g. sound, lighting, presence of workers) considering the critical periods for the birds, including breeding, migration and overwintering;**<br>o **short and long-term changes in food sources in terms of types, quality, availability, distribution and function;** |
| ECCC-33 | 8.9.2. Effects to birds, migratory birds and their habitat<br>Pg. 71 | Clarification needed in relation to the timing of activities and disturbance impacts. | ECCC recommends the following edits to bullet point 13 (new text in bold):<br><br>• describe the activities most likely to result in disturbance, injury or take of birds (migratory and non-migratory), their nests and eggs, such as vegetation clearing, increased noise from industrial machinery and railway; **and indicate the timing window for those activities, the amount, duration, frequency, and timing of disturbances,** and whether or not those activities would be permanent or non-permanent in the environment. |
| ECCC-34 | 8.9.2. Effects to birds, migratory birds and their habitat<br>Pg. 71 | Explanations of bird displacement being offset by an abundance of available habitat need to be supported by evidence. | ECCC recommends the following new bullet point:<br><br>• in the event of bird displacement, assumptions regarding temporary or permanent relocation of displaced birds should be supported using evidence that there is available habitat within the local or regional study area to allow relocation, and should be supported by monitoring within the applicable study areas. |

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| ECCC-35 | 8.9.3. Mitigation and enhancement measures<br>Pg. 72 | The proponent should provide justification for the timing windows that are being considered. | ECCC recommends the following new bullet point:<br><br>• describe and justify the specific timing windows that are being considered; |
| **8.11. Species at risk and their habitat** | | | |
| ECCC-36 | 8.11. Species at Risk and their habitat<br>Pg. 76 | Adjusted wording with respect to COSEWIC. | ECCC recommends the following edits to paragraph 2 (new text in bold, deleted text in strikethrough):<br><br>The Impact Statement must address tailored requirements for each species at risk listed on Schedule 1 of the federal *Species at Risk Act*, **or species assessed** ~~or recommended~~ by COSEWIC **as extirpated, endangered, threatened or of special concern. It is recommended to refer to the most recent COSEWIC annual report for the list of assessed wildlife species posted on its website** ~~to be listed on Schedule 1~~, if the species or its habitat are likely to be in the project area or study areas. Specifically, the Impact Statement must consider each of these species at risk as a valued component: |
| ECCC-37 | 8.11.1. Baseline conditions<br>Pg. 76 | The potential and residual impacts, particularly those related to habitat loss, must be assessed for each of the species at risk likely to be present in the study area. Each of these species should be the subject of a separate impact analysis since each of them faces its own reality, threats or issues.<br><br>This requirement is necessary to ensure consistency with section 79 of SARA: to determine the potential adverse effects on the listed species and its critical habitat (including any plant species) and, if the project is carried out, to ensure that that measures are taken to avoid or lessen these effects and to control them, and ensure that these measures are compatible with any recovery strategy and any applicable action plan. | ECCC recommends addition of the following new sub-bullet points:<br><br>The Impact Statement must, for each species identified in the list above~~:~~<br>• **provide up-to-date baseline studies that are representative of current conditions;**<br>• **for each species at risk identified in the list above:**<br>o **describe abundance (including relative abundance in each habitat type), population status, and distribution;**<br>o **describe seasonal and annual variation in abundance, distribution, and habitat use;**<br>o **provide a map showing survey sites, species sighting records, the areas of highest concentration or areas of use;**<br>o **provide information and/or mapping at an appropriate scale for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed Critical Habitat and/or recovery habitat (where applicable), differentiated by federal and non-federal lands;** ~~**and**~~<br>o **describe the general life history (e.g. breeding, foraging) that may occur in the project area, or be affected by the Project; and**<br>o **identify critical periods (e.g. denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;** |
| ECCC-38 | 8.11.1. Baseline conditions<br>Pg. 76 | Important references are listed in Appendix 2, and should be cross-referenced in this section for transparency. | ECCC recommends the following edits to the first bullet point:<br><br>• provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans. **This includes, but is not limited to, the resources and guidance in Appendix 2;** |

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| ECCC-39 | 8.11. 1. Baseline conditions Pg. 77 | Added additional requirements to assess bats within the project area and local study areas.<br><br>Recommended removal of redundant text as a part of general information asked for in the list above. | ECCC recommends the following edits to the bullet points following paragraph 3 (new text in bold, deleted text in strikethrough):<br><br>• describe species with the potential to be present based on desktop analysis **and include any results of surveys undertaken to confirm individual species using the project site**;<br>• **quantify baseline activity to evaluate relative use of different habitats or features in the project area and to help support and evaluate project siting decisions and impact predictions;**<br>• **document baseline conditions within the project area and local study area to support study of impacts;**<br>• Provide detailed information and mapping at an appropriate scale for any hibernacula and roosting habitat including the results of surveys undertaken as outlined in *Bat and Bat Habitats: Guidelines for Wind Power Projects, 2011*;<br>• Describe relative abundance of roosting habitat in the project area, local study area, and regional study area;<br>• **identify potential regional migration corridors;**<br>• **identify site-specific travel corridors and movement patterns;**<br>• ~~describe the general life history (e.g. breeding, foraging) that may occur in the project area, or be affected by the project; and~~<br>• ~~identify critical periods (e.g. breeding, roosting), typical setback distances, or other restrictions related to these species.~~ |
| ECCC-40 | 8.11.1. Baseline conditions Pg. 77 | Bullet 3 states: "define the entire Kesagami Caribou Range as the regional study area and assess baseline conditions and effects at the range-scale". The section should also provide guidance for defining the local study area for caribou. | ECCC recommends the following new sub-bullet points be added under bullet 3 of paragraph 3:<br><br>• **With respect to defining the local study area:**<br>o **Include potential areas of caribou use considering best available data. Best available data includes, but is not limited to:**<br>▪ **recent and/or historical observations, surveys (aerial, fecal) & telemetry data; and Indigenous knowledge.**<br>▪ **Home range size estimates for the local population if available, or provincial/national estimates as a proxy. Any buffer size chosen should encompass the maximum home range size estimate.**<br>• **Consult with experts of the relevant jurisdiction and provide a justification of the extent of the local study area.** |
| ECCC-41 | 8.11.1. Baseline conditions Pg. 77 | Range disturbance metrics are calculated using different methods federally and provincially. Clarity and additional guidance should be added to the TISG. | ECCC recommends the following edits to bullet point 4 of paragraph 3 (new text in bold):<br><br>• provide the best information available from the Government of Ontario and Environment and Climate Change Canada regarding population size, habitat condition, level of disturbance (anthropogenic vs. fire), trends, in the absence of the Project, within the study areas<br>o **In some instances, provincial methodologies may differ from federal recommendations. Consider both methodologies in order to apply the federal 35% habitat threshold, and to determine the amount of habitat** |

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| | | | **disturbance. If provincial disturbance information applies more recent information (i.e., best available), this information should also be considered.** |
| ECCC-42 | 8.11.1. Baseline conditions Pg. 78 | Edits to clarify text. | ECCC recommends the following edits to bullet point 2 (new text in bold, deleted text in strikethrough):<br><br>• **provide** ~~describe~~ the best available information about use of the study areas by boreal caribou (e.g. distribution, movement, timing) over project timelines; **and supplement this information with data from additional baseline studies where there are gaps in information** ~~use surveys and collaring data to supplement existing data if additional information is needed~~ to build confidence with conclusions (having consulted the Government of Ontario and Environment and Climate Change Canada **on survey methodology for caribou and on development of any study plans for the species**); |
| ECCC-43 | 8.11.1. Baseline conditions Pg. 78 | Information on biophysical attributes can be specifically found in Appendix H of the Amended Recovery Strategy. | ECCC recommends the following edits to bullet point 8 of paragraph 3 (new text in bold, deleted text in strikethrough):<br><br>• describe, over project timelines, the type and spatial extent of biophysical attributes and permanent alterations present in the project study area and local study area, as defined in **Appendix H of** the *Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 2020*; |
| ECCC-44 | 8.11.1. Baseline conditions Pg. 78 | The current state of predator and/or alternate prey access is required specifically within the local study area. | ECCC recommends the following edits to bullet point 12 (new text in bold):<br><br>• describe the current state of predator and/or alternate prey access into otherwise undisturbed areas **within the local study area;** |
| ECCC-45 | 8.11.2. Effects to species at risk and their habitat Pg. 78 | ECCC has recommended additional text regarding the species at risk assessment to ensure consistency with requirements in other valued component sections. | ECCC recommends the addition of the following bullets to paragraph 1 on page 78 of section 8.11.2.:<br>The Impact Statement must, for each species identified in the list above:<br><br>• describe the potential effects of the project on species at risk identified above **and its critical habitat (including its extent, availability and presence of biophysical attributes).** The analysis of potential effects should be provided separately for each species at risk, including separate analyses for each activity, component and phase of the project;<br>• **describe the key indicators used to assess project effects and the sensitivity of species at risk to disturbance. Provide a rationale for their selection, including a clear connection to the indicators used to characterize baseline conditions;** |
| ECCC-46 | 8.11.2. Effects to species at risk and their habitat Pg. 78 | It is important that the potential to introduce the invasive Emerald Ash Borer be considered in the assessment of impacts to Black Ash. | ECCC recommends the following edits to the bullet point under paragraph 1 (new text in bold):<br><br>• describe potential effects on black ash throughout the project area and local study area, including direct and indirect effects from vegetation clearing, **introduction of invasive species (e.g. Emerald Ash Borer),** dewatering, and other changes to the environment, and describe the location of individuals affected. |

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| ECCC-47 | 8.11.2. Effects to species at risk and their habitat<br>Pg. 79 | Added additional requirements for bats to fully understand effects to individuals and habitat. | ECCC recommends the following edits the bullet points that follow paragraph 2 (new text in bold):<br><br>• **provide an assessment of potential adverse effects on bat individuals;**<br>• provide the relative abundance of roosting habitat in the project area, local study area and regional study area including the percentage of total lost in each study area;<br>• **describe the potential effects to hibernacula in the project area, local study area and regional study area including the percentage lost in each study area.** |
| ECCC-48 | 8.11.2. Effects to species at risk and their habitat<br>Pg. 79 | It is unclear why there is a need to specify emissions or drainage as a component of the project that may remove or alter biophysical attributes.<br><br>It is important to require an explanation for the determination of whether or not the project will remove or alter any physical attributes necessary for boreal caribou. | ECCC recommends the following edits to bullet point 2 in paragraph 3 (new text in bold, deleted text in strikethrough):<br><br>• determine whether the Project will remove or alter any biophysical attributes necessary for boreal caribou~~,~~ ~~including through emissions or drainage~~, **and provide an explanation for the conclusion***;* |
| ECCC-49 | 8.11.2. Effects to species at risk and their habitat<br>Pg. 79 | The calculation required in sub-bullet 1, under bullet 3 in paragraph 3 is a determination of existing habitat affected by the project. Adding the word 'overlapping' would add relevant specificity to the calculation, so that only the permanent alterations, and 500 m buffer, that are spatially overlapped with the project footprint are discounted, and not *all* permanent alterations in the area. | ECCC recommends the following edits to bullet 3, sub-bullet 1, in paragraph 3:<br><br>• with respect to effects on existing habitat at the scale of the range,<br>o provide an account (and GIS file if available) of existing habitat affected using the following formula: (Project footprint + 500-metre buffer) – **overlapping** (permanent alteration(s) + 500 m buffer) (see glossary in the federal recovery strategy); |
| ECCC-50 | 8.11.3. Mitigation and enhancement measures<br>Pg. 80 | ECCC will review the mitigation measures outlined in the Impact Statement with the expectation that the mitigation hierarchy was used to determine appropriate measures related to species at risk. It is important for the TISG to provide clarity on this expectation for the proponent and for the Agency to determine whether the proponent has demonstrated following the mitigation hierarchy. | ECCC recommends the following edits to paragraph 1 (new text in bold):<br><br>The Impact Statement must **demonstrate the use of the mitigation hierarchy to select appropriate mitigation measures and** describe the measures for mitigating potential effects on species at risk and their habitat, including: |

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| ECCC-51 | 8.11.3. Mitigation and enhancement measures<br>Pg. 80 | Added COWEWIC Status Reports as a source of information. It is recommend the Impact Statement also include a requirement for mitigation measures to control the spread of Emerald Ash Borer. | ECCC recommends the following edits to the bullet points under paragraph 2 (new text in bold):<br><br>• provide an account of how the project, mitigation and offsetting measures for black ash (if any) are consistent with any provincial recovery strategy, action plan, management plan or **COSEWIC Status Reports** for the species.<br>• **describe measures to identify, prevent and control the spread of any introduced Emerald Ash Borer;** |
| ECCC-52 | 8.11.3. Mitigation and enhancement measures<br>Pg. 80 | Added a requirement to describe measures to prevent the release of harmful substances to be consistent with similar requirements in other valued component sections and with other recent TISGs. | ECCC recommends addition of the following new bullet point below paragraph 1:<br><br>• describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by species at risk; |
| ECCC-53 | 8.11.3. Mitigation and enhancement measures<br>Pg. 81 | Added additional requirements for bats necessary to assess the effectiveness of mitigation measures. | ECCC recommends addition of the following new bullet points under paragraph 3:<br><br>• describe the effectiveness of the mitigation measures, taking into account the configuration of the resources in the environment and how local bat populations use these resources;<br>• describe how bat behaviour (differentiated by species) has been taken into account, based on the geographical location and time period; |
| ECCC-54 | 8.11.3. Mitigation and enhancement measures<br>Pg. 81 | It is important to include guidance regarding timing windows for sensitive periods for bats. Understanding the type and nature of the work in relation to where maternity roosts and hibernacula are located is necessary to determine when planning the timing of project activities.<br><br>The maternity roost season includes a range of sensitive periods, including when bats are mating, pregnant, establishing roosts, birthing/nursing, pup rearing, and when pups are generally non-volant (incapable of flight). If there are no hibernacula present, that timing window will not apply. | ECCC recommends the following edits to bullet points 6-13 under paragraph 1 (new text in bold, deleted text in strikethrough):<br><br>• temporal avoidance (timing of disruption, destruction of resting areas or exclusion):<br>o ~~avoid disruption, destruction and exclusion between April 30 and September 1;~~<br>o **Avoid disturbance to maternity roosts and hibernacula (or areas that have the potential to contain maternity roosts or hibernacula) during sensitive periods. Consider the following general sensitive periods in the development of plans:**<br>▪ **Hibernacula: October to April**<br>▪ **Maternity roost season: May to August**<br>• lighting:<br>o **avoid or** minimize the use of artificial light in bat habitats;<br>• other compensation **(offsets);** |
| ECCC-55 | 8.11.3. Mitigation and enhancement measures | Follow-up program requirements are not provided for Boreal Caribou in TISG Section 17 (Follow-up programs). Expectations for follow-up | ECCC recommends the following edits to bullet point 6 (new text in bold, deleted text in strikethrough):<br><br>• design and implement a follow-up program **in accordance with section 17, including but not limited to**: |

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| | Pg. 82 | should be included in the TISG for guidance and transparency.<br>Requirements similar to those in the other TISGs would be beneficial to add to section 8.11.3.<br><br>Reference to contingency measures is duplicated in Appendix 1. | o **monitoring effects on boreal caribou (if present or if individuals become present) and their critical habitat;**<br>o **monitor the** efficacy of offsetting**;**<br>o ~~efficacy of the contingency measures implemented if individuals become present;~~<br>o **monitoring methods should follow standardized/established methods and include a robust before-after-control-impact design (or similar field-based approach) to allow for quantitative assessment of potential effects of the Project and identify any adaptive management that may be necessary;**<br>o **the methodology provided should include the monitoring schedule;**<br>o **the methodology should include a description of the performance indicators that will be used to evaluate the effectiveness of the mitigation or offsetting measures; and**<br>o **identify circumstances and mechanisms under which corrective/adaptive measures may be implemented to address any issue or problem identified through the follow-up programs or environmental monitoring. For example, if unanticipated effects occur or the effects are greater than anticipated;** |
| **8.12. Climate Change** | | | |
| ECCC-56 | Section 8.12.1 GHG Emissions Pg. 82 | Section 5.1.1 of the SACC and section 2.1 of the Technical Guide require greenhouse gas emissions based on project maximum throughput or capacity. ECCC recommends the TISG be revised to align with the SACC and Technical Guide. | ECCC recommends the following edits to bullet point 2 (new text in bold):<br><br>• net GHG emissions by year for each phase of the Project based on the Project's maximum **throughput or** capacity (additional guidance in section 2.1 of the Technical Guide); |
| ECCC-57 | Section 8.12.1 GHG Emissions Pg. 83 | The Detailed Project Description includes a diesel fuel farm. ECCC recommends an upstream greenhouse gas emissions assessment be conducted if the project will have upstream emissions greater or equal to the threshold outlined in Table 1 of the SACC. | ECCC recommends addition of the following new bullet point:<br><br>• an upstream greenhouse gas emissions assessment should be conducted should the project have the potential to result in upstream GHG emissions greater than or equal to the thresholds outlined in Table 1 in Section 3.2.2 of the SACC, as described in Section 3.2 and 5.2 of the SACC. Additional guidance is provided in Section 5 of the Technical Guide. |
| **13. Effects of potential accidents or malfunctions** | | | |
| ECCC-58 | 13.3 Emergency management Pg. 116 | The project footprint does not include marine operations therefore grounding incidents should not be mentioned. | ECCC recommends the following edits to bullet point 6 (deleted text in strikethrough):<br><br>• describe the role of the proponent in the case of spill, collision~~, grounding~~ or other accidents or malfunctions associated with the Project |
| **14. Effects of the environment on the Project** | | | |
| ECCC-59 | 14. Effects of the environment on the Project | Bullet 5 of the TISG states:<br><br>"describe the Project's climate resilience and how the impacts of climate change have been | ECCC recommends the text that references the SACC and Technical Guide at the bottom of p.118 be moved up and placed within bullet 5. This will ensure that the reference to this guidance is linked clearly with this request. |

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| | Pg. 118 | integrated into the project design and planning (including water and tailings management infrastructure and processes) throughout the life of the Project, and describe the climate data, projections and related information used to assess risks over the life of the Project"<br><br>At the bottom of pg. 118 the TISG states:<br><br>"Additional guidance related to conducting climate change resilience assessments is included in the Strategic Assessment of Climate Change and the Draft technical guide related to the Strategic Assessment of Climate Change: Assessing climate change resilience." | |
| **17. Follow-up programs** | | | |
| ECCC-60 | 17.2 Follow-up program monitoring<br>Pg. 123 | ECCC recommends additional requirements be added to strengthen the requirement and make it more consistent with other recent TISGs. | ECCC recommends addition of the following new bullet points:<br><br>• a description of the indicators to be used to assess progress towards established objectives and a rationale for their selection;<br>• an explanation of how any differences in predicted effects vs actual measured effects will be attributed to either uncertainty related to predictions or to effectiveness of the mitigation measures; |
| **Appendix 1 – Additional Guidance** | | | |
| ECCC-61 | Appendix 1 – Additional guidance<br>Pg. 125 | Additional sources of information that should be specifically mentioned in the existing list of federal, provincial, territorial, municipal and local databases to search. | ECCC recommends addition of the following new sub-bullets points under bullet point 2:<br><br>o Ontario Natural Heritage Information Centre<br>o Make a natural heritage area map |
| ECCC-62 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wetlands<br>Pg. 133 | The 3 levels of assessment, and associated methods or approaches, are outlined in *Wetland Ecological Functions Assessment: An Overview of Approaches*, which is referenced under Appendix 2 resources and guidance under Wetlands.<br><br>This recommendation is intended to provide greater clarity about how to apply the approaches within each level of assessment. Executing both level 1 and level 2 assessments in | ECCC recommends the following edits to bullet point 1 and sub-bullet points that follow (new text in bold, deleted text in strikethrough):<br><br>• Complete **a Level 1 assessment across the Regional Study Area using the Ontario Land Cover Compilation v2.0, and a Level 2** ~~this~~ assessment for a representative selection of wetlands that the project would directly impact and of wetland(s) that are hydrologically connected. In conducting this assessment, the proponent should ensure that wetlands are considered in the context of:<br>o the larger watersheds of which they are a part;<br>o adjacent land use with a focus on hydrological and other functions;<br>o landscape and/or watershed considering topography, soil types and hydrological linkages; and, |

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| | | the impact assessment are needed to understand wetland functions within the ecosystem (level 2) as well as the relationship of wetlands and their functions to the surrounding landscape (level 1). Level 3 methods are research-based metrics, require development and validation for new geographic regions, are focused on a single specific function, and are too detailed for this project and information needs for the impact assessment. Level 3 assessments are therefore not required. | o the global significance of peatlands across the regional study area. |
| ECCC-63 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wetlands<br>Pg. 133 | Greater clarity and consistency on what should be considered within the wetland functions assessment. | ECCC recommends the following edits to bullet point 6 (new text in bold):<br><br>• be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides. **At a minimum, the assessment must consider hydrological, biogeochemical, habitat, and climate functions. Climate functions may be nested within the hydrological and biogeochemical functions or considered separately, depending on the methodology selected**; |
| ECCC-64 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wetlands<br>Pg. 133 | Edited to improve clarity regarding modeling requirements. | ECCC recommends the following edits to bullet point 9 (new text in bold, deleted text in strikethrough):<br><br>• ~~plan~~ survey protocol **planning** for representative wetlands **should** ~~to~~ include **development of statistical models** ~~modeling~~ and **use of** simulations to estimate sampling requirements, and ~~analysis~~ analyses to evaluate resulting design options. Sample size must be planned to support evaluation of the project ~~study~~ area within the context of the LSA and RSA. Appropriate design of surveys will need to consider multiple survey locations in order to represent the wetland heterogeneity of the RSA, and to yield multiple survey locations per wetland type, without requiring aggregation of habitat classes post-hoc; |
| ECCC-65 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components | Changed to use the same language that is used in Section 8.7.1 Baseline Conditions and in other sections in the appendices such as Wildlife and Species at Risk, and to use consistent wording regarding providing data. | ECCC recommends the following edits to bullet point 1 (new text in bold, deleted text in strikethrough):<br><br>• ~~consider submitting complete data sets from any survey sites, including GIS files~~<br>• **It is recommended that the proponent be prepared to:**<br>o **submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and** |

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| | Wetlands<br>Pg. 134 | | ○ **provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation).** |
| ECCC-66 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wetlands<br>Pg. 134 | The requirement to contact relevant provincial and local government authorities to determine if other wetland conservation policies, regulations or wetland compensation guidelines apply is redundant as there is a similar requirement in section 8.6.1. Since it is not related to the wetland functions assessment, recommend keeping it in section 8.6.1 and removing here. | ECCC recommends bullet point 2 be deleted:<br><br>• ~~contact the relevant provincial and local government authorities to determine if other wetland conservation policies, regulations or wetland compensation guidelines apply. See also resources available from The Wetland Network~~. |
| ECCC-67 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 135 | Bullet point 1 is very similar to a requirement in section 8.9.1 Baseline Conditions. The Appendices are intended to provide additional guidance on proper methods to obtain baseline conditions. | ECCC recommends bullet point 1 be deleted:<br><br>• ~~the proponent should consider and assess the following groups of migratory and non-migratory birds separately: waterfowl, water birds (other than waterfowl), songbirds, shorebirds, each bird species at risk and their habitat~~; |
| ECCC-68 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 135 | Properly designed and conducted surveys are necessary to produce data that will lead to reliable conclusions. | ECCC recommends the following edits to bullet point 2 (new text in bold):<br><br>• **data collection should come from surveys that are designed to meet the defined outcomes and goals for the Impact Statement. Designed data collection (as opposed to haphazard, opportunity or convenience based sampling) ensures that goals are met, and the potential for biases in the data collected are minimized.** Avian surveys should be designed based on a thorough review of the available scientific literature pertinent to the specific region, bird groups and anticipated effects; |
| ECCC-69 | Appendix 1 – Additional guidance | It is important that clear guidance be provided to ensure any existing data that is used meets stringent requirements. | ECCC recommends addition of the following new bullet point before the last bullet point on page 135, and edits to the last bullet point on page 135 and following sub-bullet points on page 136 (new text in bold, deletions in strikethrough): |

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| | Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 135-136 | If only using desktop analysis or existing data the Proponent must demonstrate data sufficiency and be able to justify decisions for why additional sampling was not required.<br><br>Minor rephrasing is recommended here to provide clarifications regarding use of modeling and simulations. | • **if existing data are available for the study area, they can be used to complement the project. If existing data are intended to replace project-specific sampling, a demonstration must be presented that show these data and survey designs meet the requirements described below;**<br>• ~~in those situations where field surveys are necessary to be confident in a conclusion (e.g., to increase certainty that mitigation is not needed, or to improve specificity in the documentation of biodiversity loss),~~ in order to establish adequate baseline conditions for birds, the proponent should take into account the following technical recommendations:<br>o collect data to account for natural variability among years, within and among seasons, and within the 24-hour daily cycle;<br>o collect data in a manner to allow for reliable extrapolations in space (i.e., at a minimum in the project area, LSA, and RSA) and in time (i.e., over the years);<br>o design surveys so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of the effectiveness of mitigation measures. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e., project area, LSA, RSA), any departures from predictions, and the effectiveness of mitigation measures. Justify the selection of modeling techniques based on current and recent scientific literature;<br>o survey protocol planning should include ~~modeling and simulations~~ **the development of statistical models, use of simulations** to estimate sampling requirements and analyses to evaluate survey design options. ~~It is recommended to~~ **C**ollect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases, so does the understanding of natural variability. **Repeated sampling of locations or spatial overlap of sampling between years is required to separate spatial variability from temporal variability;**<br>o use spatially balanced and randomly chosen sampling sites, preferably using stratified random sampling that covers all habitat types **and expected gradients**. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;<br>o **provide full documentation for any simulations used to select sample sites and sample sizes or parameter estimates used as decision criteria;**<br>o **plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary;**<br>o have sufficient sampling effort and sampling locations to reflect variability among habitat type in the project, LSA, and RSA, with more intensive sampling effort:<br>▪ in the project area;<br>▪ in areas or habitats more likely to be affected by the Project;<br>▪ for rare species that may be harder to detect; |

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| | | | o ~~take into account detection errors and provide unbiased estimates of abundance and distributions using, as appropriate, simulation modelling in study design~~ **if necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias. Minimize, quantify, and understand bias(es) in estimates of abundance that impair extrapolation and statistical inferences.**<br>o **Take into account detection and measurement errors in statistical models where appropriate;** |
| ECCC-70 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 136 | ECCC recommends removal of this bullet point as it is identical to an existing bullet point in section 8.9.1. This is information required in the baseline section, while the Appendices provides additional information on how to collect needed baseline data. This deletion is consistent with other recent TISGs. | ECCC recommends the second last bullet point be deleted:<br><br>• ~~where predictive modelling is required, provide the explanatory data (e.g., covariables such as associated land cover, etc.) required to predict effects on bird groupings (e.g., changes in abundance, distribution or other relevant effects) collected in such as way as to represent the following sources of variation where applicable: spatial variation in land cover composition, soil type, geomorphology, hydrological processes, and inter-annual and intra-annual climate variability;~~ |
| ECCC-71 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 136-137 | Collapsed metrics of avian biodiversity are of limited use in characterizing baseline conditions; rather, species level information is needed. Main bullet header on page 136 should be removed and species level indices emphasized. Clarifications added. | ECCC recommends the following edits to last bullet point on page 136 and the following sub-bullet points on page 137 (new text in bold, deleted text in strikethrough):<br><br>• ~~when selecting metrics to characterize avifauna biodiversity, it is recommended that:~~<br>• ~~biodiversity~~ metrics **for individual species** should include the following: distribution in space, frequency of occurrence, occurrence and abundance trends in time, abundance and density, as well as the types of associated habitats and the strength of the associations; ~~and~~<br>• ~~species communities should not be grouped together by diversity indicator and~~ **analyses and descriptions of baseline conditions for bird species** should not be limited to ~~the~~ indicator species. The identification of species, distribution, abundance and, when possible, estimates of species' breeding status should be the main quantification objectives. **Collapsing assessments into proxy (equivalent to focal or indicator) species is likely to lead to inaccurate estimates of project impacts when a project is expected to impact many bird species. The use of proxy species is likely to lead to unreliable conclusions since the assumption of equal impacts to all species within groups may be unfounded;** |
| ECCC-72 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components | Total number of birds using a site is more valuable in this situation than presence/absence. | ECCC recommends the following edits to bullet points 4 and 5 (new text in bold, deleted text in strikethrough):<br><br>• migratory bird concentrations can vary within a year and between years. It is therefore important to survey across the project ~~study~~ area, LSA, and RSA both temporally and spatially;<br>• ~~migratory bird~~ counts of **migratory birds** are dependent on length of stay as well as ~~presence~~ **total number of birds using a site**. Attempt to estimate abundances across a migratory period should incorporate an estimate of inter and |

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| | Birds and bird habitat<br>Pg. 137 | | intra-annual trends and estimates of lengths of stay. Irruptive species may act in ways similar to migrants in terms of abundance. They may be absent from an area until conditions change (such as a mast event), during which time the habitat becomes vital to these species; |
| ECCC-73 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 137 | In previous TISGs that have included additional guidance on how to quantify trophic linkages in Appendix 1 there have been related requirements in the baseline conditions section of the TISG to describe food webs and trophic linkages to summarize biotic interactions. Since that requirement is not found within this TISG, the bullet containing additional guidance in Appendix 1 should be removed. | ECCC recommends deletion of bullet point 6:<br><br>• ~~to quantify trophic linkages in the project area and the LSA, the proponent should consider using Structural Equation Models;~~ |
| ECCC-74 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 137 | This requirement was written to pertain to road impact assessments where road pathways would run along mixed wood forests that are raised areas in a matrix of lowlands/peatlands, and is not necessary for this project. | ECCC recommends deletion of bullet point 10<br><br>• ~~mixed wood and old-growth forest land cover and other upland vegetation types may be particularly important for many forest-associated birds, supporting birds during migration, breeding and through the winter. Peatlands and wetlands including fens and bogs are ecologically important elements of the landscape. River riparian corridors with adjacent mixed wood forest are another relatively uncommon feature that should be clearly identified;~~ |
| ECCC-75 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat | The definition of migratory birds is based in legislation.<br><br>ECCC recommends removal of this requirement as it is also found in section 8.9.1. (8th bullet). This information is more appropriately located in the baseline section, not the Appendix which provides more direction on how to collect required data. | ECCC recommends the following edits to bullet point 12 (new text in bold, deleted text in strikethrough:<br><br>• distinguish between **birds listed under the *Migratory Birds Convention Act, 1994* and birds that are not listed under the Act**; ~~migratory and non-migratory birds;~~<br><br>ECCC recommends deletion of the last bullet point:<br><br>• ~~justify any~~ assumptions ~~regarding relocation or temporary displacement during construction and operation of the Project by using scientific references. The reference data should provide evidence that there is a significant number~~ |

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| | Pg. 137 | | ~~of equivalent habitats in which the birds can move and that the vegetation removed is not unique to the project area.~~ |
| ECCC-76 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 137 | The absence on survey protocols invites the risk that data will be collected using inappropriate methods, which will impair all future uses of the data. Clear description of protocols, even if based upon standard guidance, are important for assessing data value and integrity. | ECCC recommends addition of the following new bullet point:<br><br>• describe the protocols used to conduct surveys using point counts, Autonomous Recording Units, and aerial survey methods and provide rationale for why the selected protocols are best suited for the project; |
| ECCC-77 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 137 | Appropriate survey protocols are necessary to achieve data suitable for supporting analysis, reporting and decisions. A description of recommended protocols is needed to encourage robust data collection. This addition provides guidance in relation to surveys for songbirds and other species detected by sound. | ECCC recommends addition of the following new bullet points:<br><br>• Avian surveys should include:<br>  • Avian Point counts:<br>  o Each site should be sampled by human observers using a standardized 10-minute point count. To enable observer-to- recorder comparisons, observers should also record the survey visit using a high quality portable recording device (i.e., with 360- degree recording in WAV format, selectable sampling rate, and adjustable microphone gain), mounted on a tripod. Observers should be skilled in bird identification by sight and sound, and should use 1- minute intervals within the 10-minute point count duration such that each individual bird is entered in the first minute interval in which it was detected. Estimated distances from observers to each bird should be recorded as: 0-50m, 50m-100m, and beyond 100m.<br>  • Autonomous Recording Units (ARUs):<br>  o Deployment of ARUs should be used to inform estimates of site use by birds across a broad range of dates (including seasons) and times of day. Since ARUs capture bird movements across dates and times, sampling on ARU Transects should be conducted on a subset of sites within transects. This subset should include the route centreline site, with the remaining sites at 500-metre spacing out to the transect endpoint:<br>  o Within each sampling year, ARUs should be deployed at sites as long as possible, with a minimum period of May 1 through July 10 (Breeding Recordings). Use deployments that maximize full use of battery and sound card capacity;<br>  o A subset of at least 50% of the ARU sites should have ARUs deployed to align with periods during which sites are used by birds in fall migration (August 1 through September 30) and during the winter (December 1 through March 31) (i.e., collectively, Fall/Winter Recordings). These fall and winter sites may be a subset of either entire ARU transects or sites along transects but land cover analysis should be used to ensure the subset is an unbiased sample of the population of ARU sites; |

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| | | | o ARU deployments for Breeding Recordings should be programmed to record daily or every 2nd day, with a morning and an evening schedule. Recording should occur in two phases to avoid single recordings spanning two dates. Phase 1 would start at 00:00 (HH:MM), with a schedule of 3-minutes On and 12-minutes Off until 5 hours beyond local sunrise (i.e., SR+5hr). Phase 2 would start 30 minutes before local sunset, with a schedule of 3-minutes On and 12-minutes Off until 23:56 (HH:MM);<br>o ARUs should be set to record using a sampling rate of 44.1kHz.<br>• Acoustic file and data analysis:<br>o acoustic files should be analysed by interpreters skilled in identifying birds by sound and familiar with bird communities of the region sampled. Interpretation of acoustic files should be done using the Wildtrax interface (https://www.wildtrax.ca/home ), with each individual detected recorded as a data point and referenced to the first 1-minute interval it was detected.<br>o Prior to interpretation, acoustic files suitable for analysis should be identified by examining spectrograms and listening to a short segment of the file. Files with substantial wind, rain or other noise (e.g., frogs) should be excluded.<br>o From the set of suitable files in the Breeding Recordings, select one (1) 3-minute segments per week from the Night period (midnight to 1 hour before sunrise), two (2) 3-minute segments per week for the Morning period (1 hour before to 5 hours after local sunrise), and one (1) 3-minute segment per week from the Dusk period (30 minutes before to 2 hours after local sunset).<br>o From the set of suitable files in the Fall/Winter recordings, select three (3) 3-minute segments per week from the Morning period (1 hour before to 5 hours after local sunrise). |
| ECCC-78 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 137 | Appropriate survey protocols are necessary to achieve data suitable for supporting analysis, reporting and decisions. ECCC recommends including a description of recommended protocols to encourage robust data collection. This addition provides guidance in relation to aerial surveys for waterfowl, waterbirds, and other birds detected visually. | ECCC recommends addition of the following new bullet points:<br><br>• aerial waterfowl survey protocols should include:<br>• Survey Windows:<br>o Spring Breeding Survey Window: Conduct surveys between early/mid-May and late-June. The survey period typically starts once ice-melt begins and open water becomes available to breeding pairs within a survey area. This survey window allows opportunity to observe / detect both early-nesting and late-nesting waterfowl species that might be both breeding within, and still potentially migrating through, a survey area. Be sure to collect / carefully code observations of various classes / groups of waterfowl during spring to help identify breeding birds (e.g., lone/single male duck [indicated breeding pair, IBP], male/female pair) from possible non-breeding / migrant birds (flock/groups of males, males + females or males + females + immature birds, see Bordage et al. 2017 *(https://www.researchgate.net/publication/315654492_Helicopter-based_Waterfowl_Breeding_Pair_Survey_in_Eastern_Canada_and_Related_Studies )*. Birds also may be observed flushing off of, or near, nests throughout the survey window and should be recorded / documented. Also, it is possible that broods of earlier-nesting species also may be present toward the latter part of this survey window and should be recorded / documented. Annual timing of the surveys will depend on spring weather conditions. Conducting 2 or more surveys separated by several weeks |

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| | | | throughout this period may be required to adequately capture early-nesting and late-nesting species (e.g., survey 1 in early/mid-May, survey 2 in late-May/early-June, survey 3 in mid/late-June).<br>o Fall Migration Survey Window: Conduct surveys between mid-August and late-November. There also will likely be use of the area by some migrant waterfowl during fall / migration given there are ponds, lakes, rivers and wetland habitats in area. During the fall survey window, recorded observations will consist of counts (for small aggregations) or visual estimates (for large aggregations) of the number of individuals of each species. At this time of year, the sex or age of individuals is not needed to identify breeding birds, so focus primarily on recording an accurate count of individuals for each species. Conducting 3 or more surveys separated by several week throughout this period may be required to adequately capture changes in abundance due to varying migration chronologies of species that may use the survey area (e.g., survey 1 in late-August/early-September, survey 2 in early/mid-October, survey 3 in late-October/early-November, survey 4 in mid/late-November).<br>• Survey Type<br>o Use aerial surveys to document the distribution and abundance of all species of waterfowl or other similar-sized, visible species of waterbirds (e.g., sandhill cranes, common loons, grebes, herons, bitterns, coots, gallinules, gulls), on all waterbodies (ponds, lakes, rivers) associated with wetland landscapes (e.g., marshes, bogs, fens, and swamps) within the survey area (or distinct sub-sections of it, e.g., sample plot)<br>• Survey Crew and Equipment<br>o Follow the standard operating procedures for the human observer approach for waterfowl surveys as outlined in Bordage *et al*. (2017).<br>o Use a helicopter (equipped with pop-out floats) with a crew capacity (including pilot) of at least 3 people. Helicopters are recommended over fixed-wing aircraft, due to the flexibility to fly at relatively slower speed, hover and circle back if observers require another look at certain features or birds, or to adjust positioning for better lighting/visibility as well as are well suited to areas with variable topography.<br>o Use at least 1 (back-up units recommended) Global Positioning System (GPS) to record a flight track of the survey at 1-second frequency.<br>o Use at least 1 digital voice recorder (back-up units recommended), that is capable of time-stamping individual recording files, per experienced observers so recordings can be linked to the flight track to geo-reference all observed counts or use a laptop running voice recording software (e.g., PC Mapper or similar program) in flight that automatically geo-references recorded observations.<br>o Use a survey crew consisting of a pilot highly familiar with wildlife surveys, and up to three observers experienced with identifying target species from the air.<br>• Daily Survey Timing<br>o Start surveys no earlier than 1-2 hours after sunrise and end no later than 1-2 hours before sunset, to avoid glare from sun at low angles; between 0900 and 1600 is generally optimal.<br>o Try to survey the entire study area (or distinct sub-sections of it, e.g., sample plot) in one day to avoid bias from day-to-day changes in conditions and bird numbers. |

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| | | | o Try to limit survey time to about 6 hours per day to limit observer fatigue, especially if surveys span multiple consecutive days.<br>• Field Methods<br>o Methods highlighted and summarized below are largely based on the revised standard operating procedures outlined for inland breeding waterfowl surveys in Appendix 6 of Bordage et al. (2017).<br>o Safety is paramount for aerial surveys, and any guidelines below regarding flight safety, flight height or speed can be adjusted at the discretion of the pilot.<br>o No aerial surveys should be initiated when adverse weather is forecast (i.e., snowfall, moderate-to-heavy rain, fog, thunderstorms, gusty winds) or during low light levels due to smoke or heavy cloud cover or other conditions that lead to poor visibility or if wind exceeds 40 km/h (turbulence) and if there are any other safety concerns.<br>o Georeference each observation location, listing all species observed, and count or (for larger aggregations) estimate of the number of individuals present. If the age and sex of individuals is not pertinent to the assessment, focus primarily on recording an accurate count for each species. Digital voice recording can be useful for collecting data, but take care to first test settings to ensure clarity and accurate date/time settings.<br>o Follow a flight path that optimizes viewing conditions for the observer(s) and minimizes the likelihood of flushing birds.<br>o Aim to fly 15-50 m above ground, unless a higher altitude is required for safety reasons, to meet permit conditions, or to avoid disturbance to birds or other animals (including livestock).<br>o Limit speed to <100 km/h along open, straight shorelines, and to <30 km/h along shorelines with extensive emergent vegetation, and over wetlands.<br>o Stay within 100 m of open, straight shorelines, and within 50 m of shorelines with more well-developed cover.<br>o Follow watercourses until open water is no longer visible, or the edge of the study area is reached.<br>o Avoid circling back over an area unless there are large flocks that cannot be accurately counted on the first pass, there is concern over misidentification errors, or the initial positioning or speed of the aircraft prevented observers from having a clear view. |
| ECCC-79 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat | The Framework document cited was published in 2009. Statistical and modeling conventions have undergone dramatic changes since that time so the analytical methods in that document are no longer the recommended or necessary approaches. | ECCC recommends the following edit to first major bullet on page 138:<br><br>• *Framework for the Scientific Assessment of Potential Project Impacts on Birds* for examples of project types and ~~recommended~~ **potential** techniques for assessing effects on migratory birds; |

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| | Pg. 138 | | |
| ECCC-80 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Birds and bird habitat<br>Pg. 138 | Submission of data sets and supporting documentation is required to allow for a clear understanding of methods and results. | ECCC recommends adding the following new bullet points:<br><br>• It is recommended that the proponent be prepared to:<br>o submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and<br>o provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation). |
| ECCC-81 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wildlife and species at risk<br>Pg. 138-139 | It is beneficial to provide additional guidance related to survey design. | ECCC recommends the following edits and additions to the following bullets and sub-bullets on pages 138 and 139 (new text in bold, deleted text in strikethrough):<br><br>• ~~collect data to represent sources of temporal variation between years, during and between seasons (e.g., spring migration, breeding, fall migration, wintering), and in the daily 24-hour cycle;~~<br>• ~~consider that rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys;~~<br>• **data collection should come from surveys that are designed to meet the defined outcomes and goals for the Impact Statement. Designed data collection (as opposed to haphazard, opportunity or convenience based sampling) ensures that goals are met, assumptions for analysis and statistical modelling are met, and the potential for biases in the data collected are minimized. Wildlife surveys should be designed based on a thorough review of the available scientific literature pertinent to the specific region, wildlife, and anticipated effects;**<br>• **collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability. Repeated sampling of locations or spatial overlap of sampling between years is required to separate spatial variability from temporal variability;**<br>• **if recent existing data is available for the study area, it can be used to complement the data collected in the field. If data from prior surveys is used to replace further sampling (e.g., only one year of sampling is planned to be conducted), a demonstration must be presented that these data and survey designs meet the requirements outlined below;** |

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| | | | • survey protocol planning should include **development of statistical models**, use of ~~modeling and~~ simulations to estimate sampling requirements and analyses ~~analysis~~ to evaluate ~~resulting~~ survey **design** options. It is recommended to:<br>o collect data to represent sources of temporal variation between years, during and between seasons (e.g., spring migration, breeding, fall migration, wintering), and in the daily 24-hour cycle;<br>o consider that rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys;<br>~~o collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability;~~<br>~~o if existing data are available for the study area, it can be used to complement the data collected in the field. The available data must be sufficiently robust to assess the variability of populations between years and a demonstration must be presented for that purpose;~~<br>o **collect data in a manner to allow for reliable extrapolations in space (i.e. at minimum in the project area, local and regional study area) and in time (i.e. over the years);**<br>o **design surveys so that they represent the spatial and temporal targets of modelling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of the effectiveness of mitigation measures. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e. project area, LSA, RSA), any departures from predictions, and the effectiveness of mitigation measures. Justify the selection of modeling techniques based on current and recent scientific literature;**<br>o **use spatially balanced and randomly chosen sampling sites, preferably using stratified random sampling that covers all habitat types. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;**<br>o **provide the criteria and document any simulations used to select sample sites and sample sizes;**<br>o plan the sample size **and survey design** to ensure sufficient assessment of the project area in the context of the LSA and RSA. Survey design will need to ~~consider a large number of sites to~~ represent the RSA habitat and to plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary;<br>o design sampling effort per unit area - field survey effort to be most intensive within the project ~~study~~ area. The level of effort per unit area may be similar or somewhat less within the remainder of the LSA, but should be scaled to the likelihood that project effects will effect species within that zone. Efforts outside the project ~~study~~ area should be carefully designed to ensure that estimates comparing within and across the project area, LSA, and RSA are unbiased and as precise as possible; and<br>o use simulation **modelling in designing surveys and statistical methods** to assess **if methods are expected to have levels of** bias and precision **that ensure the estimates are useful for comparison** between project |

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| | | | area, LSA, and RSA ~~to ensure the estimates are useful for comparison~~ **and to compare performance of potential survey design**;<br>o **if necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias. Minimize, quantify, and understand bias(es) in estimates of abundance that impair extrapolation and statistical inference;**<br>o **provide estimates of confidence or error for all estimates of abundance and distribution. Estimates should be defined (e.g., mean across years, mean across sites, modeled prediction) and, if appropriate, confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals);** |
| ECCC-82 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wildlife and species at risk<br>Pg. 139 | Additional details on baseline study requirements provides important guidance and is consistent with requirements found in other TISGs. | ECCC recommends addition of the following new bullet points:<br><br>Requirements specific to bats:<br><br>• Include the following types of surveys:<br>o acoustic surveys, ensure study design is statistically valid;<br>o continuous acoustic monitoring throughout the night (as least sunset to sunrise; 30 minutes before sunset to 30 minutes after sunrise recommended) active season (spring dispersal/ migration, breeding summer/ fall migration and swarming), as well as appropriate hibernaculum surveys;<br>o locate and assess potential hibernacula and roosts for use by bats, accounting for inter-annual and within-season variability in use, including existing mine infrastructure;<br>• Data or reports must include information on acoustic detection methods used, including the following:<br>o detector make and model;<br>o microphone model used;<br>o location of Detectors;<br>o height of microphones;<br>o orientation of microphones;<br>o special housing that may affect microphone sensitivity (e.g. wind screen, cones, weatherproofing, etc.);<br>o mounting method (e.g. meteorological tower, pole, etc.);<br>o device specific settings (e.g. gain/ sensitivity, TBC, etc.);<br>o recording mode (i.e. full spectrum or zero-crossing);<br>o a summary of any issues with equipment failure, and a description of procedures used to ensure equipment was operational during deployment (including ensuring microphone sensitivity remains within an acceptable range);<br>• Clearly describe methods used to define a bat “pass” and be consistent with the definition used for any comparison group. Provide a rationale for the chosen method;<br>• Clearly describe methods used for acoustic identification, including any validation procedures used, criteria used for deciding on species classifications, and software used (including versions and settings); and |

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| | | | • Where results are compared across years, timing of surveys compared, equipment and setup protocols must remain consistent across years;<br>• Note that study design, analysis and acoustic data interpretation of results require the services of a bat expert; |
| ECCC-83 | Appendix 1 – Additional guidance<br><br>Guidance for biophysical components<br><br>Wildlife and species at risk<br>Pg. 139 | Additional guidance on baseline study requirements specific to caribou that are consistent with other recent TISGs would strengthen the Wildlife and species at risk section of Appendix 1. | ECCC recommends the following bullet points be added after paragraph 1:<br><br>• **With respect to caribou, the proponent should :**<br>o **provide the best available information from the relevant jurisdiction concerning baseline range population size and trend;**<br>o **consult with experts of the relevant jurisdiction on appropriate survey methodologies for caribou. Provide a justification for the selected methodologies as compared to other options;**<br>o **in designing surveys for caribou, the following information sources should be consulted:**<br>▪ **Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (IAP) (request from Ontario Ministry of Environment, Conservation and Parks);**<br>▪ **General Habitat Description for the forest-dwelling Woodland Caribou (Rangifer tarandus caribou) (GHD);**<br>▪ **Ontario's Woodland Caribou Conservation Plan (CCP);**<br>▪ **Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP);**<br>▪ **Indigenous knowledge holders from across all of the potentially impacted Indigenous groups identified by the Agency;** |
| **Appendix 2 – Resources and guidance** | | | |
| ECCC-84 | Appendix 2 – Resources and guidance<br><br>Birds, migratory birds and their habitat<br>Pg. 140 | Added citation provided in aerial survey protocol description. | ECCC recommends addition of the following citation:<br><br>Bordage, D., M.C. Bateman, R.K. Ross, and C. Lepage. 2017. Helicopter-based waterfowl breeding pair survey in Eastern Canada and related studies. Black Duck Joint Venture Special Publication. 236 p. |
| ECCC-85 | Appendix 2 – Resources and guidance<br><br>Species at risk<br>Pg. 148 | The federal amended recovery strategy reference and link is outdated and should be updated to include the most recent version (dated 2020). | ECCC recommends the following edits to the references (new text in bold, deleted text in strikethrough):<br><br>~~*Woodland Caribou, Boreal population (Rangifer tarandus caribou): amended recovery strategy* [proposed]. 2019. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-publicregistry/recovery-strategies/woodland-caribou-boreal-2019.html~~ |

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| | | | **Amended Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2020.html** |
| ECCC-86 | Appendix 2 – Resources and guidance<br><br>Species at risk<br>Pg. 147-148 | Additional general species at risk and caribou specific resources should be added to Appendix 2. | ECCC recommends the following additional references be added:<br><br>Protection Statement for the habitat to which the Migratory Birds Convention Act, 1994 applies for Migratory Birds under SARA. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/critical-habitat-statements/protection-statement-habitat-mbca-1994-applies-migratory-birds-listed-under-sara.html<br><br>Residence Description/Rationales. Available at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/residence-descriptions.html<br><br>Integrated Range Assessment for Woodland Caribou and their Habitat. Kesagami Range 2010. December 2014. Available at https://files.ontario.ca/environment-and-energy/species-at-risk/Kesagami-Range-EN.pdf<br><br>Integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (IAP) (request from Ontario Ministry of Environment, Conservation and Parks).<br><br>Ontario's Caribou Conservation Plan (CCP). 2009. Available at https://www.ontario.ca/page/woodland-caribou-conservation-plan<br><br>Range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP). Available at https://www.ontario.ca/page/range-management-policy-support-woodland-caribou-conservation-and-recovery<br><br>General Habitat Description for the Forest-dwelling Woodland Caribou (GHD). Available at https://www.ontario.ca/page/general-habitat-description-forest-dwelling-woodland-caribou |