

# *Vegetation and Wildlife Mitigation and Monitoring Plan 2025 Annual Report*

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*Site C Clean Energy Project  
31 March 2026*

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## List of Acronyms

BC - British Columbia  
BCCDC/CDC - BC Conservation Data Centre  
BMP - Best Management Practices  
CEMP - Construction Environmental Management Plan  
cm – centimeter  
COSEWIC - Committee on the Status of Endangered Wildlife in Canada  
CWD - coarse woody debris  
CWS - Canadian Wildlife Service  
dB - decibel  
DUC – Ducks Unlimited Canada  
EAC - Environmental Approval Certificate  
ECCC - Environment and Climate Change Canada  
EIS - Environmental Impact Statement  
EPP - Environmental Protection Plan  
ERPT - Experimental Rare Plant Translocation  
FDS - Federal Decision Statement  
FRPA – Forest and Range Practices Act  
ha - hectare  
Hwy – Highway  
IAAC – Impact Assessment Agency of Canada  
IEM - Independent Environmental Monitor  
km – kilometer  
LAA – Local Assessment Area  
m – metre  
mm – millimetre  
mm/second – millimetres per second  
MFLNRO – BC Ministry of Forests, Lands, Natural Resource Operations  
MLWRS – Ministry of Land, Water, and Resource Stewardship  
MOE – BC Ministry of Environment  
MOECCS – BC Ministry of Environment and Climate Change Strategy  
MOF – BC Ministry of Forests  
MOTI – BC Ministry of Transportation and Infrastructure  
MWLRS – BC Ministry of Water, Land and Resource Stewardship  
QEP - Qualified Environmental Professional  
ppv - peak particle velocity  
PRRD - Peace River Regional District  
psi – pounds per square inch  
RAA - Regional Assessment Area  
RoW – Right-of-Way  
SARA - *Species at Risk Act*  
SME – Subject Matter Expert  
TEM - Terrestrial Ecosystem Mapping  
UWR - Ungulate Winter Range  
VCDMP - Vegetation Clearing and Debris Management Plan  
VWMMP - Vegetation and Wildlife Mitigation and Monitoring Plan  
VWTC - Vegetation and Wildlife Technical Committee  
WFA – Wetland Function Assessment

## 1.0 Introduction

The Vegetation and Wildlife Mitigation and Monitoring Plan (VWMMP; the Plan) describes the measures that will be used to mitigate potential adverse effects of the Site C Clean Energy Project (the Project) on vegetation and ecological communities and wildlife resources during the construction and operation of the Project. The Plan was developed in accordance with the conditions of the Project's provincial Environmental Assessment Certificate (EAC #E14-02, or 'EAC') and the Federal Decision Statement (FDS) issued for the Project in 2014. The draft and first revisions of the VWMMP were submitted to regulatory agencies and Aboriginal Groups for review and feedback on 17 October 2014, and 7 April 2015, respectively. The final VWMMP was submitted to the same recipients on 5 June 2015, with annual updates posted on the Site C Project website at:

[https://www.sitecproject.com/sites/default/files/Veg\\_and\\_Wildlife\\_Mit\\_and\\_Mon\\_Plan.pdf](https://www.sitecproject.com/sites/default/files/Veg_and_Wildlife_Mit_and_Mon_Plan.pdf).

The purpose of this report is to describe the mitigation and monitoring measures that are described in the VWMMP and were implemented in 2025.

## 2.0 Objective and Scope

The objective of this VWMMP Annual Report (the Report) is to describe the mitigation and monitoring measures implemented in 2025 to meet the requirements of FDS conditions 9, 10, 11, 16 and 18 and EAC conditions 9 to 12, 14 to 16, 19, 21, 23, and 24. These conditions, and where they are addressed in current or past VWMMP Annual Reports are listed in Tables 1 and 2 below.

The requirements of EAC conditions 8 and 13 (for Vegetation and Ecological Communities), and conditions 17, 18, 20, and 22 (for Wildlife Resources) are addressed in the Construction Environmental Management Plan (CEMP) and/or the Vegetation Clearing and Debris Management Plan (VCDMP). Therefore, those conditions are not addressed in this report.

**Table 1. Federal Decision Statement conditions and associated annual report sections**

<b>FDS Condition</b>	<b>Condition</b>	<b>Report Section</b>
9	Disturbance and destruction of migratory birds	Section 6.1
9.1	The Proponent shall ensure that the Designated Project is carried out in a manner that avoids mortality and disturbance of migratory birds and their nests.	Section 6.1.1
9.2	The Proponent shall prepare and submit to the Agency an annual schedule, describing the location and timing for construction and reservoir filling activities, 90 days prior to initiating any of these activities.	Section 6.1.2
9.3	The Proponent shall develop, in consultation with Environment Canada, a plan to monitor and mitigate potential disturbance of breeding migratory birds in and adjacent to the Project Activity Zone,	Section 6.1.3

<b>FDS Condition</b>	<b>Condition</b>	<b>Report Section</b>
	including the area immediately downstream of the dam where risks to migratory bird nests could occur, during construction, reservoir filling and operation.	
9.9	The Proponent shall address potential risks of bird collisions with the transmission line, in consultation with Environment Canada, by:	
9.9.1	conducting a risk assessment for bird collisions under the current transmission line design;	2016 Annual Report (Section 6.1.3)
9.9.2	determining if additional mitigation measures could be implemented to reduce the risk of bird collisions;	Section 6.1.4
10	Non-wetland migratory bird habitat	Section 6.2
10.2	The Proponent shall develop, in consultation with Environment Canada, a plan that addresses potential effects of the Designated Project on non-wetland migratory bird habitat.	
10.3	The plan shall include:	
10.3.1	non-wetland migratory bird habitat baseline conditions for habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact;	Section 6.2.1
10.3.2	migratory bird abundance, distribution and use of non-wetland habitat;	Section 6.2.2
10.3.3	measures to mitigate the changes in aquatic and riparian-related food resources and other habitat features associated with a change from a fluvial to a reservoir system;	Section 6.2.3
10.3.4	compensation measures to address the unavoidable loss of non-wetland migratory bird habitat, including habitat associated with the Canada Warbler, the Cape May Warbler and the Bay-Breasted Warbler;	Section 6.2.4
10.3.5	an analysis of the effects of any compensation measures identified in condition 10.3.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples; and	Section 6.2.5
10.3.6	an approach to monitor and evaluate the effectiveness of the mitigation or compensation measures to be implemented and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory bird habitat, including migratory bird use of that habitat.	Section 6.2.6
11	Wetlands used by migratory birds and for current use of lands and resources for traditional purposes	Section 6.3
11.1	The Proponent shall mitigate the potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes by Aboriginal people.	Section 6.3.1

<b>FDS Condition</b>	<b>Condition</b>	<b>Report Section</b>
11.2	The Proponent shall develop, in consultation with Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups, a plan that addresses potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes.	Section 6.3.2
11.3	The Proponent shall, in developing the plan, describe how the mitigation hierarchy and the objective of no net loss of wetland functions were considered.	Section 6.3.3
11.4	The plan shall include:	
11.4.1	baseline data on the biogeochemical, hydrological and ecological functioning of the wetlands and associated riparian habitat in the area affected by the Designated Project, including: ground and surface water quality and quantity; vegetation cover; biotic structure and diversity; migratory bird abundance, density, diversity and use; species at risk abundance, density, diversity and use; and current use of the wetlands for traditional purposes by Aboriginal people, including the plant and wildlife species that support that use	Section 6.3.4
11.4.2	mitigation measures to maintain baseline wetland functions for those wetlands that will not be permanently lost;	Section 6.3.5
11.4.3	an approach to monitor and evaluate any changes to baseline conditions, as defined in condition 11.4.1 and identify improvements based on monitoring data;	Section 6.3.6
11.4.4	compensation measures to address the unavoidable loss of wetland areas and functions supporting migratory birds, species at risk, and the current use of lands and resources by Aboriginal people in support of the objective of full replacement of wetlands in terms of area and function	Section 6.3.7
11.8	The Proponent shall commence the implementation of the compensation measures specified in condition 11.4.4 no later than five years from the initiation of construction.	Section 6.3.8
11.9	The Proponent shall implement each component of the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and at the end of year 1, 2, 3, 5, 10, 15, 20 and 30 of operation.	Section 6.3.9
16	Species at risk, at-risk and sensitive ecological communities, and rare plants	
16.1	The Proponent shall ensure that potential effects of the Designated Project on species at risk, at-risk and sensitive ecological communities and rare plants are addressed and monitored.	Section 6.4

<b>FDS Condition</b>	<b>Condition</b>	<b>Report Section</b>
16.2	The Proponent shall develop, in consultation with Environment Canada, a plan setting out measures to address potential effects of the Designated Project on species at risk, at-risk and sensitive ecological communities and rare plants.	Section 6.4
16.3	The plan shall include:	
16.3.1	field work to verify the modeled results for surveyed species at risk and determine the habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact for those species, including the Short-eared Owl, the Western Toad and the Myotis Bat species	2015 Annual Report (Section 6.4.1)
16.3.2	surveys to determine whether the rare plant species potentially facing extirpation in the Project Activity Zone are found elsewhere in the region	2017 Annual Report (Section 6.4.1; Section 7.2.1; Appendix 9)
16.3.3	measures to mitigate environmental effects on species at risk and at-risk and sensitive ecological communities and rare plants;	Section 6.4.1
16.3.4	conservation measures to ensure the viability of rare plants, such as seed recovery and plant relocation;	Section 6.4.2
16.3.5	an approach to avoiding or minimizing the use of herbicides and pesticides in areas that could impact species at risk, at-risk and sensitive ecological communities and rare plants;	2017 Annual Report (Section 6.4.4)
16.3.6	an approach to monitor and evaluate the effectiveness of mitigation measures and to verify the accuracy of the predictions made during the environmental assessment on species at risk, at-risk and sensitive ecological communities and rare plants; and	Section 6.4.3
16.3.7	an approach for tracking updates to the status of listed species identified by the Government of British Columbia, Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and the <i>Species at Risk Act</i> (SARA), and implementation of additional measures, in accordance with species recovery plans, to mitigate effects of the Designated Project on the affected species should the status of a listed species change during the life of the Designated Project.	Section 6.4.4

Table 2. Environmental Assessment Certificate conditions and associated annual report sections

<b>EAC Condition</b>	<b>Condition</b>	<b>Report Section</b>
<b>Vegetation and Ecological Communities</b>		

EAC Condition	Condition	Report Section
9	The EAC Holder must develop a Vegetation and Invasive Plant Management Plan to protect ecosystems, plant habitats, plant communities, and vegetation with components applicable to the construction phase.	Section 7.1
	The Vegetation and Invasive Plant Management Plan must include at least the following:	
	<b>Invasive Species</b>	
	<ul style="list-style-type: none"> <li>Surveys of existing invasive species populations prior to construction.</li> </ul>	2015 Annual Report (Section 7.1.1)
	<ul style="list-style-type: none"> <li>Invasive plant control measures to manage established invasive species populations and to prevent invasive species establishment.</li> </ul>	Section 7.1.1
	<b>Rare Plants and Sensitive Ecosystems</b>	
	<ul style="list-style-type: none"> <li>The EAC Holder must expand its modelling, including completing field work, to improve identification of rare and sensitive plant communities and aid in delineation of habitats that may require extra care, 90 days prior to any Project activities that may affect these rare or sensitive plant communities</li> </ul>	2015 Annual Report (Section 7.1.3)
	<ul style="list-style-type: none"> <li>The EAC Holder must, with the use of a Qualified Environmental Professional (QEP), complete an inventory in areas not already surveyed and use rare plant location information as inputs to final design of access roads and transmission lines. These pre-construction surveys must target rare plants as defined in Section 13.2.2 of the Environmental Impact Statement (EIS) including vascular plants, mosses, and lichens.</li> </ul>	Section 7.1.2
	<ul style="list-style-type: none"> <li>The EAC Holder must create and maintain a spatial database of known rare plant occurrences in the vicinity of Project components that must be searched to avoid effects to rare plants during construction activities. The database must be updated as new information becomes available, and any findings of new rare plant species occurrences must be submitted to Environment Canada<sup>1</sup> and the BC Ministry of Environment (MOE<sup>2</sup>) using provincial data collection standards.</li> </ul>	Section 7.1.3
<ul style="list-style-type: none"> <li>The EAC Holder must implement construction</li> </ul>	Section 7.1.4	

<sup>1</sup> Currently known as Environment and Climate Change Canada (ECCC).

<sup>2</sup> Currently known as the BC Ministry of Water, Land and Resource Stewardship (MWLRS).

EAC Condition	Condition	Report Section
	<p>methods to reduce the impact to rare plants, maximize use of existing access corridors, and construct transmission towers and temporary roads away from wetlands and known rare plant occurrences.</p>	
	<ul style="list-style-type: none"> <li>Protect known occurrences of Tufa seeps, wetlands and rare plants located adjacent to construction areas. Install signage and flagging where necessary, as determined by the QEP, to indicate the boundaries of the exclusion area.</li> </ul>	Section 7.1.5
	<ul style="list-style-type: none"> <li>The EAC Holder will engage the services of a Rare Plant Botanist during construction to design and implement an experimental rare plant translocation program following MOE's Guidelines for Translocation of Plant Species at Risk in BC (Maslovat 2009).</li> </ul>	Section 7.1.6
10	<p>The EAC Holder must fund or undertake directly with the use of a Rare Plant Botanist the following, during construction:</p>	2017 Annual Report (Section 7.2)
	<ul style="list-style-type: none"> <li>Targeted surveys in the Regional Assessment Area (RAA; as defined in the amended EIS) to identify occurrences of the 18 directly affected rare plant species (as defined in the amended EIS), and rare plant species identified by MOE's Conservation Framework requiring additional inventories</li> </ul>	2017 Annual Report (Section 7.2.1 and Appendix 9)
	<ul style="list-style-type: none"> <li>A study focused on clarifying the taxonomy of <i>Ochroleucus</i> bladderwort (<i>Utricularia ochroleuca</i>), including field, herbaria, and genetic work in consultation with the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and the BC Conservation Data Centre of MOE.</li> </ul>	2017 Annual Report (Section 7.2.2 and Appendix 10)
11	<p>EAC Holder must compensate for the loss of rare and sensitive habitats and protect occurrences of rare plants by developing, or funding the development and implementation of a compensation program, during construction, that includes:</p>	Section 7.2
	<ul style="list-style-type: none"> <li>Assistance (financial or in-kind) to the managing organization of suitable habitat enhancement projects in the RAA (RAA as defined in the amended EIS).</li> </ul>	Section 7.2.1
	<ul style="list-style-type: none"> <li>Direct purchase of lands in the RAA and manage these lands and suitable existing properties owned by the EAC Holder to enhance or retain rare plant values where opportunities exist.</li> </ul>	Section 7.2.2

EAC Condition	Condition	Report Section
	The EAC Holder must engage with MFLNRO, MOE and Aboriginal Groups with regard to the development of the compensation program.	Section 7.2.3
12	The EAC Holder must develop a Wetland Mitigation and Compensation Plan.	Section 7.3
	The Wetland Mitigation and Compensation Plan must include an assessment of wetland function lost as a result of the Project that is important to migratory birds and species at risk (wildlife and plants). The Wetland Mitigation and Compensation Plan must be developed by a QEP with experience in wetland enhancement, maintenance and development.	Section 7.3.1
	The Wetland Mitigation and Compensation Plan must include at least the following:	
	<ul style="list-style-type: none"> <li>• Information on location, size and type of wetlands affected by the Project</li> </ul>	Section 7.3.1.1
	<ul style="list-style-type: none"> <li>• If roads cannot avoid wetlands, culverts will be installed under access roads to maintain hydrological balance, and sedimentation barriers will be installed;</li> </ul>	2017 Annual Report (Section 7.3.1.2)
	<ul style="list-style-type: none"> <li>• Stormwater management will be designed to control runoff and direct it away from work areas where excavation, spoil placement, and staging activities occur.</li> </ul>	2017 Annual Report (Section 7.3.1.3)
	<ul style="list-style-type: none"> <li>• Develop, with the assistance of a hydrologist, site-specific measures prior to construction to reduce changes to the existing hydrologic balance and wetland function during construction of the Jackfish Lake Road and Project access roads and transmission line.</li> </ul>	2017 Annual Report (Section 7.3.1.4)
	<ul style="list-style-type: none"> <li>• All activities that involve potentially harmful or toxic substances, such as oil, fuel, antifreeze, and concrete, must follow approved work practices and consider the provincial BMP guidebook Develop with Care (BC MFLNRO and BC MOE 2014) or as amended from time to time.</li> </ul>	2017 Annual Report (Section 7.3.1.5)
14	<p>The EAC Holder must develop a Vegetation and Ecological Communities Monitoring and Follow-up Program for the construction phase and first 10 years of the operations phase. The Vegetation and Ecological Communities Monitoring and Follow-up Program must be developed by a QEP.</p> <p>The Vegetation and Ecological Communities</p>	Section 7.4

EAC Condition	Condition	Report Section
	Monitoring and Follow-up Program must include at least the following:	
	<ul style="list-style-type: none"> <li>• Definition of the study design for the rare plant translocation program (see condition 9).</li> </ul>	7.4.1
	<ul style="list-style-type: none"> <li>• Plan for following-up monitoring of any translocation sites to assess the survival and health of translocated rare plant species, under the supervision of a Rare Plant Botanist.</li> </ul>	7.4.2
	<ul style="list-style-type: none"> <li>• Measurement criteria, including vegetation growth, persistence of rare plants and establishment / spread of invasive plant species, and associated monitoring to document the effectiveness of habitat enhancement and possible compensation programs.</li> </ul>	7.4.3
<b>Wildlife Resources</b>		
15	The Wildlife Management Plan must be developed by a QEP.	Section 7.5
	The Wildlife Management Plan must include at least the following:	
	<ul style="list-style-type: none"> <li>• Field work, conducted by a QEP, to verify the modelled results for surveyed species at risk and determine, with specificity and by ecosystem, the habitat lost or fragmented for those species. The EAC Holder must use these resulting data to inform final Project design and to develop additional mitigation measures, as needed, as part of the Wildlife Management Plan, in consultation with Environment Canada and MFLNRO.</li> </ul>	2015 Annual Report (Section 7.3.1)
	<ul style="list-style-type: none"> <li>• Measures to avoid, if feasible, constructing in sensitive wildlife habitats. If avoiding sensitive wildlife habitats is not feasible, condition 16 applies.</li> </ul>	Section 7.5.1
	<ul style="list-style-type: none"> <li>• If sensitive habitats, such as wetlands, are located immediately adjacent to any work site, buffer zones must be established by a QEP to avoid direct disturbance to these sites.</li> </ul>	Section 7.5.2
	<ul style="list-style-type: none"> <li>• Protocol for the application of construction methods, equipment, material and timing of activities to mitigate adverse effects to wildlife and wildlife habitat.</li> </ul>	Section 7.5.3
	<ul style="list-style-type: none"> <li>• Protocol to ensure that lighting is focused on work sites and away from surrounding areas to manage</li> </ul>	Section 7.5.4

EAC Condition	Condition	Report Section
	light pollution and disturbance to wildlife. If lighting cannot be directed away from surrounding areas, the EAC Holder must ensure additional mitigation measures are implemented to reduce light pollution, including light shielding.	
	<ul style="list-style-type: none"> <li>A mandatory environmental training program for all workers so that they are informed that hunting in the vicinity of any work site/Project housing site is strictly prohibited for all workers.</li> </ul> <p>The EAC Holder must ensure that all workers are familiar with the Wildlife Management Plan.</p>	Section 7.5.5
16	If loss of sensitive wildlife habitat or important wildlife areas cannot be avoided through Project design or otherwise mitigated, the EAC Holder must implement the following measures, which must be described in the Vegetation and Wildlife Mitigation and Monitoring Plan.	Section 7.6
	The Vegetation and Wildlife Mitigation and Monitoring Plan must include the following compensation measures:	
	<ul style="list-style-type: none"> <li>Compensation options for wetlands must include fish-free areas to manage the effects of fish predation on invertebrate and amphibian eggs and larvae and young birds.</li> </ul>	Section 7.6.1
	<ul style="list-style-type: none"> <li>Mitigation for the loss of snake hibernacula, artificial dens must be included during habitat compensation.</li> </ul>	Section 7.6.2
	<ul style="list-style-type: none"> <li>Management of EAC Holder-owned lands adjacent to the Peace River suitable as breeding habitat for Northern Harrier and Short-eared Owl.</li> </ul>	2017 Annual Report (Section 7.6.1)
	<ul style="list-style-type: none"> <li>Establishment of nest boxes for cavity-nesting waterfowl developed as part of wetland mitigation and compensation plan and established within riparian vegetation zones along the reservoir on BC Hydro-owned properties.</li> </ul>	Section 7.6.3
	<ul style="list-style-type: none"> <li>Creation of wildlife trees to increase nesting, roosting, and denning habitat supply for cavity-dwelling wildlife over multiple time scales such as woodpeckers, owls, migratory passerines, kestrels, squirrels, bats, and furbearers.</li> </ul>	Section 7.6.4
	<ul style="list-style-type: none"> <li>A design for bat roosting habitat in Hwy 29 bridges to BC Ministry of Transportation and Infrastructure (MOTI) for consideration into new bridge designs located within the Peace River valley.</li> </ul>	Section 7.6.5

EAC Condition	Condition	Report Section
	<ul style="list-style-type: none"> <li>Following rock extraction at Portage Mountain, creation of hibernating and roosting sites for bats.</li> </ul>	Section 7.6.6 VWMMP Section 8.7.6
	<ul style="list-style-type: none"> <li>Creation of natural or artificial piles of coarse woody debris dispersed throughout the disturbed landscape to maintain foraging areas and cold-weather rest sites, and arboreal resting sites, for the fisher population south of the Peace River.</li> </ul>	Section 7.6.7
19	The EAC Holder must use reasonable efforts to avoid and reduce injury and mortality to amphibians and snakes on roads adjacent to wetlands and other areas where amphibians or snakes are known to migrate across roads including locations with structures designed for wildlife passage	Section 7.7
21	The EAC Holder must ensure that measures implemented to manage harmful Project effects on wildlife resources are effective by implementing monitoring measures detailed in a Vegetation and Wildlife Mitigation and Monitoring Plan.	Section 7.8
	The Vegetation and Wildlife Mitigation and Monitoring Plan must be developed by a QEP.	Section 7.8
	The Vegetation and Wildlife Mitigation and Monitoring Plan must include at least the following:	
	<ul style="list-style-type: none"> <li>Monitor Bald Eagle nesting populations adjacent to the reservoir, including their use of artificial nest structures.</li> </ul>	Section 7.8.1
	<ul style="list-style-type: none"> <li>Monitor waterfowl and shorebird populations and their use of natural wetlands, created wetlands, and artificial wetland features.</li> </ul>	Section 7.8.2
	<ul style="list-style-type: none"> <li>Monitor amphibian use of migration crossing structures installed along Project roads.</li> </ul>	Section 7.8.3
	<ul style="list-style-type: none"> <li>Survey songbird and ground-nesting raptor populations during construction and operations</li> </ul>	Section 7.8.4
	<ul style="list-style-type: none"> <li>Require annual reporting during the construction phase and during the first 10 years of operations to the Environmental Assessment Office (EAO), beginning 180 days following commencement of construction.</li> </ul>	Section 7.8.5
23	The EAC Holder must maintain current knowledge of Project effects on the status of listed species by tracking updates for species identified by the Province, COSEWIC, and SARA.	Section 7.9

<b>EAC Condition</b>	<b>Condition</b>	<b>Report Section</b>
24	The EAC Holder must identify suitable lands for ungulate winter range (UWR) by the end of the first year of construction, on BC Hydro-owned lands, or Crown lands, in the vicinity of the Project in consultation with MFLNRO. If MFLNRO determines that identified winter range is required, the EAC Holder must identify and maintain suitable BC Hydro-owned lands for UWR to the satisfaction of MFLNRO and for the length of time determined by MFLNRO.	Section 7.10

### 3.0 Consultation

Consultation regarding the development and implementation of individual programs conducted in 2025 is provided below.

#### 3.1 Canadian Wildlife Service

In 2025, BC Hydro continued to consult with the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada (ECCC) during plan development and implementation. Consultation occurred primarily through the Vegetation and Wildlife Technical Committee (VWTC), to which CWS, BC Hydro, and provincial agencies belong. The VWTC was established by the provincial Comptroller of Water Rights under Conditional Water Licences 132990 and 132991 (see Section 3.2).

#### 3.2 Consultation with the Province

The VWTC was formed to provide ongoing engagement between BC Hydro, the BC Ministry of Environment and Climate Change Strategy (MOECCS) and the BC Ministry of Water, Land and Resource Stewardship (MWLRS; formerly the BC Ministry of Land, Water and Resource Stewardship aka. MLWRS, and prior to that, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development aka. MFLNRORD or truncated as MFLNRO) with respect to the implementation of vegetation and wildlife mitigation and monitoring programs. The province requested that the VWTC be formed as a sub-committee of the existing BC and BC Hydro joint Fish / Hydro Management Committee. CWS joined the VWTC in July 2016.

The VWTC met in person or via conference call quarterly (four) times in 2025 to address the Program Areas listed in Schedule A of Conditional Water Licenses 132990 and 132991. Table 3 summarizes the status of the Schedule A Program Areas as of 31 December 2025.

**Table 3.** Status of Annual Schedule A Program Area Plans as of 31 December 2025.

Program Area Plans	Status
<b>Completed</b>	
1. Ungulates	Complete
2. Wetlands and Riparian Habitat – Compensation and Mitigation	Ongoing
3. Fisher	Complete
4. Bat Mitigation and Hibernacula Construction	Complete
5. Snakes – Hibernacula Monitoring	Ongoing
6. Amphibians – Mitigation and Monitoring	Ongoing
7. Bald Eagles – Nest Monitoring	Ongoing
8.1 Breeding and Migratory Birds – Songbirds	Ongoing
8.2 Breeding and Migratory Birds – Waterbirds	Ongoing
8.3 Breeding and Migratory Birds – Common Nighthawk	Complete
8.4. Breeding and Migratory Birds – Cavity Nesters (Woodpeckers)	Ongoing
8.5. Breeding and Migratory Birds – Nest Monitoring	Ongoing
8.6. Breeding and Migratory Birds – River to Reservoir memo	Complete
8.7. Breeding and Migratory Birds – Bank Swallow	Ongoing
9. Ground-nesting Raptors	Ongoing
10. Cavity-nesting species	Ongoing
11. Rare Plants	Ongoing

<b>Program Area Plans</b>	<b>Status</b>
12. Sharp-tailed Grouse	Complete
13. Lighting Effects	Complete
14. Carnivore Den Sites	Complete
15. Other Raptors	Complete
16. Other Species at Risk	Ongoing
17. Furbearers	Complete
18. Ungulate calving habitat	Complete
19. Mineral licks	Complete
20. Bear and carnivore habitats	Complete
<b>Notes</b>	
'Complete' refers to programs that were completed by the end of 2025 or in past years. 'Ongoing' refers to programs that were conducted in 2025 and will continue during Project Operations. This table only refers to programs that were conducted in 2025 and do not refer to past or current programs that are scheduled to start or restart after scheduled time lags due to reservoir fill (e.g., downstream vegetation monitoring) or other monitoring commitments.	

## 4.0 Qualified professionals

The Qualified Professionals involved in the development and implementation of vegetation and wildlife mitigation and monitoring programs in 2025 are listed in Table 4. This list is not exhaustive and we apologize for any individuals or subcontractors that helped conduct field work that have been overlooked in our acknowledgements.

**Table 4.** Qualified Professionals involved in the development and implementation of the various programs for the VWMMP in 2025.

<b>Qualified Professional</b>	<b>Area of Work</b>
Brent Matsuda, M.Sc., R.P.Bio., BC Hydro	Vegetation and Wildlife
Harry van Oort, M.Sc., R.P.Bio., BC Hydro	Vegetation and Wildlife
Arshad Khan, B.Sc., R.P.Bio., BC Hydro	Vegetation and Wildlife
Jessica Brunet, B.Sc., R.P.Bio., BC Hydro	Vegetation and Wildlife
Michael Gillis, B.Sc., P.Ag., BC Hydro	Vegetation and Wildlife
Matt Barnette, M.Sc., P.Ag., BC Hydro	Vegetation and Wildlife
Greg Scarborough, M.Sc., R.P.Bio., BC Hydro	Program Manager, Vegetation and Wildlife
Sabrina Penney, B.Tech., AScT., BC Hydro	Program Manager, Vegetation and Wildlife
Kendra Gibbons., B.A., BC Hydro	GIS Analyst, Vegetation and Wildlife
Ryan Gill, M.Sc., R.P.Bio., BC Hydro	Bank Swallow surveys and monitoring
Brock Simons, M.Sc., R.P.Bio., Simons Strategic Ecological Support Inc.	Vegetation and Wildlife

<b>Qualified Professional</b>	<b>Area of Work</b>
Natasha Bush, M.Sc., P.Ag., EcoLogic Consultants Ltd.	Experimental Rare Plant Translocation, Wetland Monitoring Program
Dan McAllister, M.Sc., P.Ag., EcoLogic Consultants Ltd.	Experimental Rare Plant Translocation
Jamie Fenneman, Ph.D., R.P.Bio., EcoLogic Consultants	Experimental Rare Plant Translocation
Alice Lee, B.Sc., MLA, BIT, EcoLogic Consultants Ltd.	Experimental Rare Plant Translocation
Ryan Durand, M.Sc., R.P.Bio., EcoLogic Consultants Ltd.	Experimental Rare Plant Translocation, Wetland Monitoring Program
Jason Jones, Ph.D., R.P.Bio., P. Biol., EcoLogic Consultants	Experimental Rare Plant Translocation
Katherine Garrah, M.Sc., P.Ag., EcoLogic Consultants Ltd.	Experimental Rare Plant Translocation
Randy Krichbaum, M.Sc., P.Biol., R.P. Bio., Eagle Cap Consulting Ltd.	Experimental Rare Plant Translocation
Margaret Krichbaum, B.Sc., Eagle Cap Consulting Ltd.	Experimental Rare Plant Translocation
Jeff Matheson M.Sc., R.P.Bio., P.Biol., Tetra Tech Canada	Program Manager, Senior Biologist, Breeding bird and raptor monitoring
Elyse Hofs, B.Sc., Dipl.T., Tetra Tech Canada Inc.	Breeding bird, Bank Swallow, Ground-nesting raptors, Wetland monitoring
Amanda Lavalley, R.P.Bio., P.Biol., Tetra Tech Inc.	Breeding bird, Waterbird and Cavity-nest bird monitoring
Natasha Gidluck, B.Sc., B.I.T., Tetra Tech Inc.	Breeding bird, Cavity nesting bird mitigation, waterbird monitoring
Eric Digel, B.Sc., B.I.T., Tetra Tech Canada Inc.	Cavity nesting bird monitoring, Ground-nesting raptor monitoring
Sarah Boisvert, Dipl.T., B.I.T., Tetra Tech Inc.	Cavity nesting bird monitoring
Zoe Osberg, B.Sc., P.Biol., Tetra Tech Inc.	Breeding bird, Ground-nesting raptor monitoring, Waterbird monitoring
Jared Shivak, M.Sc., Ausenco Sustainability	Program Manager, Nest Monitoring
Toby St. Clair, M.Sc., P.Biol., R.P.Bio., Ausenco	Nest Monitoring
Catherine Craig, M.Sc., R.P.Bio., P.Biol., Ausenco	Nest Monitoring
Dan Webster, B.Sc., P.Ag., R.P.Bio., P.Biol., Eco-Web Ecological Consulting	Mitigation property management plan updates, Non-wetland Migratory Bird Habitat offsetting
Michele Lavalley, B.Sc., P.Ag., R.P.Bio., P.Biol., Eco-Web Ecological Consulting	Mitigation property management plan updates
Brian Paterson, B.Sc., B.E., R.P.Bio., Zonal Ecosystem and Wildlife Consultants Ltd.	Bald Eagle nest monitoring
Nathan Dyck, P.Ag., CPESC, West Moberly-DWB Limited Partnership	Program Manager, Bald Eagle surveys, Snake Den Monitoring, Bat Box Monitoring
Jason Paul, M.Sc., R.P.Bio., West Moberly-DWB Limited Partnership	Cache Creek Snake Den Monitoring, Bat Box Monitoring
Andrew Martin, M.Sc., R.P.Bio., West Moberly-DWB Limited Partnership	Cache Creek Snake Den Monitoring

<b>Qualified Professional</b>	<b>Area of Work</b>
Cesar Cestari, M.Sc., R.P.Bio., West Moberly-DWB Limited Partnership	Bald Eagle nest monitoring, Bat Box Monitoring
Adam Sprott, M.Sc., R.P.Bio., West Moberly-DWB Limited Partnership	Bat Box Monitoring
Bruce Harrison, M.Sc., R.P.Bio., Ducks Unlimited Canada	Program Manager, Wetland Compensation
Katie Mitchell, M.Sc., R.P.Bio., Ducks Unlimited Canada	Wetland Compensation
Matthias Loeseken, M.Sc., P.Ag., R.P.Bio., CPESC, Blackbird Environmental Limited Partnership	Program Manager, Downstream Snake and Toad Monitoring
Ally Nichols, B.Sc., R.P.Bio., P.Biol., Blackbird Environmental Limited Partnership	Downstream Snake and Toad Monitoring
Angela (Melney) Drechsel, B.Sc., R.P.Bio., Blackbird Environmental Limited Partnership	Downstream Snake and Toad Monitoring

## 5.0 Structure and Content

The mitigation and monitoring measures discussed in this report are organized into two parts: Section 6.0 describes those mitigation and monitoring measures that were implemented to meet the requirements of the FDS conditions; Section 7.0 describes those measures that were implemented to meet the requirements of the EAC conditions. Cross-references are provided in Section 7.0 where information provided to meet the EAC conditions is the same as that provided for the FDS conditions.

Of the programs outlined in the Vegetation and Wildlife Mitigation Plan, only riparian plantings along the newly created reservoir, which are required by FDS 10.3.3, were not implemented in 2025. Those plantings will be implemented as part of site reclamation, after reservoir fill has settled and erosion processes stabilized.

## 6.0 Implementation of Mitigation and Monitoring Measures – Federal Decision Statement Conditions

Conditions 9, 10, 11, and 16 of the FDS, respectively, set out the mitigation and monitoring requirements for the disturbance and destruction of migratory birds, non-wetland migratory bird habitat, wetlands used by migratory birds and for current use of lands and resources for traditional purposes, and species at risk, at-risk and sensitive ecological communities and rare plants (Table 1).

### 6.1 Federal Decision Statement Condition 9: Migratory Bird Mitigation and Monitoring

This section of the annual report summarizes the programs conducted in 2025 in accordance with the requirements of FDS Condition 9, shown below.

<p><b>9. Disturbance and destruction of migratory birds</b></p> <p>9.1. The Proponent shall ensure that the Designated Project is carried out in a manner that avoids mortality and disturbance of migratory birds and their nests.</p> <p>9.2. The Proponent shall prepare and submit to the Agency an annual schedule, describing the location and timing for construction and reservoir filling activities, 90 days prior to initiating any of these activities.</p> <p>9.3. The Proponent shall develop, in consultation with Environment Canada, a plan to monitor and</p>
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mitigate potential disturbance of breeding migratory birds in and adjacent to the Project Activity Zone, including the area immediately downstream of the dam where risks to migratory bird nests could occur, during construction, reservoir filling and operation.

9.4. The plan shall include measures to undertake construction, reservoir filling and operation in a manner that avoids or minimizes the risk of disturbance and mortality to migratory birds and their nests.

9.5. The Proponent shall, in preparing the plan, consult:

9.5.1. Environment Canada's policy on Incidental Take of Migratory Birds in Canada; and

9.5.2. Environment Canada's avoidance guidelines on General Nesting Periods of Migratory Birds in Canada.

9.6. The Proponent shall submit to the Agency and Environment Canada a draft copy of the plan for review 90 days prior to initiating construction.

9.7. The Proponent shall submit to the Agency the final plan a minimum of 30 days prior to initiating construction. When submitting the final plan, the Proponent shall provide to the Agency an analysis that demonstrates how it has appropriately considered the input, views or information received from Environment Canada.

9.8. The Proponent shall implement the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and for the first five years of operation.

9.9. The Proponent shall address potential risks of bird collisions with the transmission line, in consultation with Environment Canada, by:

9.9.1. conducting a risk assessment for bird collisions under the current transmission line design;

9.9.2. determining if additional mitigation measures could be implemented to reduce the risk of bird collisions; and

9.9.3. implementing any additional mitigation measures (e.g. line marking and diversions), to minimize impacts.

### **6.1.1 Condition 9.1**

This section summarizes actions taken in accordance with the following requirement of Condition 9.1: *The Proponent shall ensure that the Designated Project is carried out in a manner that avoids mortality and disturbance of migratory birds and their nests.*

In accordance with Condition 9.1, BC Hydro has, where feasible, given Project requirements and constraints, scheduled vegetation clearing outside of the migratory bird nesting period. The Project occurs within Zone B5, for which ECCC describes a general nesting period for migratory birds of 19 April to 29 August<sup>3</sup>. BC Hydro developed Section 4.17 of the CEMP to address the requirements of Condition 9.1 and EAC Condition 17 and provided an outline of the nest survey protocol in Section 3.5.1 of the Vegetation Clearing and Debris Management Plan.

BC Hydro developed a pre-clearing nesting activity survey methodology, which outlines specific field procedures to be followed to determine the likelihood that migratory bird nests are present in areas scheduled to be disturbed. The protocol also describes the approach for determining appropriate situation- and species-specific disturbance setback buffers to be applied around locations where nests are likely to be present. That document was broadly distributed to contractors starting when it was first developed in 2015 and 2016. The document was revised in 2018 and 2019 and inserted as Appendix N of the CEMP, starting with rev.6.1 in 2019.

In 2025, pre-clearing nesting activity surveys were completed between April and August wherever small-scale clearing within the migratory bird nesting period could not be avoided. If active or

<sup>3</sup>[https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#\\_zoneB\\_calendar](https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#_zoneB_calendar)

suspected nest areas were identified, protective buffers were established around active nests, as determined by a Qualified Environmental Professional (QEP). Contractor compliance with appropriate steps for mitigating the risk of incidental take of migratory birds, nests and eggs was monitored by BC Hydro environmental monitors and the Independent Environmental Monitor (IEM).

### **6.1.2 Condition 9.2**

This section summarizes actions taken in accordance with the following requirement of Condition 9.2: *The Proponent shall prepare and submit to the Agency an annual schedule, describing the location and timing for construction and reservoir filling activities, 90 days prior to initiating any of these activities.*

An initial construction schedule was submitted to CEAA on October 17, 2014, and construction of the Site C Project began on July 27, 2015.

Reservoir filling was completed between August 25, 2024 and November 7, 2024. Three generating units were placed into service on October 27, 2024, December 14, 2024 and February 22, 2025 respectively.

On August 8, 2025, successful commissioning of the sixth and final generating unit brought the Project into full operations. However, while the main dam and generating station are operational, final site restoration, cleanup, demobilization, reclamation, monitoring, and road paving continued throughout the Project footprint in 2025. Reclamation works are expected to continue through 2026.

### **6.1.3 Condition 9.3**

This section summarizes actions taken in accordance with the following requirement of Condition 9.3: *The Proponent shall develop, in consultation with Environment Canada, a plan to monitor and mitigate potential disturbance of breeding migratory birds in and adjacent to the Project Activity Zone, including the area immediately downstream of the dam where risks to migratory bird nests could occur, during construction, reservoir filling and operation.*

#### **6.1.3.1 Songbird Surveys**

The songbird monitoring program is focussed on passerines (songbird perching birds), hummingbirds, swifts, doves, kingfisher, and pigeons (all members of the orders Passeriformes, Apodiformes, Columbiformes, and Coraciiformes), which are collectively referred to as songbirds. Songbird baseline surveys were conducted in 2006, 2008, 2011 and 2012 in support of the EIS. Surveys were again conducted annually 2016 through 2025 as part of the monitoring program. The Breeding Bird Follow-up Monitoring – Songbirds 2025 Annual Report is provided in Appendix 1.

In addition, in June 2025, boat surveys were conducted in the reservoir to assess whether known colonies of Bank Swallow (*Riparia riparia*) were lost, or new habitat and colonies were created as a result of reservoir fill. This species is designated as 'Threatened' under Schedule 1 of SARA and COSEWIC. Bank Swallow surveys and monitoring help to meet FDS Condition 16 under the broader category of Species at Risk. This is discussed further in Section 6.4.1. The results of the Bank Swallow colony status post-reservoir fill are provided in Appendix 2. Monitoring was also conducted at known Bank Swallow colonies within an area of the construction site called Area A to assess their presence and breeding status. The observations of this assessment are provided in Appendix 3.

#### **6.1.3.2 Common Nighthawk Surveys**

Common Nighthawk is designated as Special Concern by COSEWIC, Threatened under Schedule 1 of SARA, and Yellow-listed (secure) in BC. Common nighthawk surveys were conducted in 2010 and 2012 in support of the EIS. Surveys again occurred over two years, with approximately half occurring in 2018 and half in 2019 as part of the monitoring program. The Common Nighthawk

Follow-up Monitoring 2018 and 2019 annual reports were provided in the 2018 and 2019 VWMMP annual reports.

### **6.1.3.3 Woodpecker Surveys**

Woodpecker surveys were conducted in 2010 in support of the EIS. Woodpecker surveys were conducted in the Project footprint within the Peace River Valley and in the BC Hydro proposed mitigation properties over a two-year period (2018 and 2019) as part of the monitoring program. The Breeding Bird Follow-up Monitoring – Woodpeckers 2019 Annual Report was provided in the 2019 VWMMP annual report.

### **6.1.3.4 Waterbird Surveys**

The waterbirds survey program is focussed on shorebirds, marsh birds, waterfowl, and other birds associated with aquatic and wetland habitats (collectively known as ‘waterbirds’). Waterbird surveys were conducted in the Peace River and adjacent wetlands in 2006 and 2008 and 2012 through 2014. Those waterbird surveys were conducted using fixed-wing aircraft and twin-engine helicopter surveys and, to a lesser extent, ground and boat surveys. No shorebirds were documented during helicopter and fixed-wing aircraft surveys between 2012 and 2014 due to the difficulty of detecting small birds using aerial surveys. As a result, methods were adapted in 2017 to continue the use of fixed-wing aircraft for aerial surveys, and to add ground, river boat, unmanned aerial vehicle and autonomous recording unit survey methods. However, aerial surveys make identifying most waterbirds to the species level difficult, and therefore the aerial component of waterbird surveys was discontinued and not applied after 2017. In discussion with CWS, unmanned aerial vehicles were discontinued in 2020 because they were not shown to be efficient for waterbird data collection. The Waterbirds Follow-up Monitoring 2025 Annual Report is provided in Appendix 4.

### **6.1.3.4 Migratory Bird Nest Monitoring**

A migratory bird nest monitoring program was developed and first implemented in 2021 to monitor the potential disturbance to breeding migratory birds from fluctuating water levels caused by construction and then operations activities. In 2022, 39 days of nest searching and monitoring surveys were conducted from June 2 to July 11, 2022. As such, 2021 and 2022 were the first and second years of the program monitoring during construction. Follow-up monitoring was then to occur in alternate years over the first 10 years of operations. However, at the time, reservoir filling was expected to occur in the fall of 2023 and hence the operations phase would begin in 2024. Since the reservoir fill did not occur until fall of 2024, monitoring was not conducted in 2024 as the Project was not yet in Operations phase. Surveys were re-initiated in 2025 as per the Migratory Bird Nest Monitoring Plan (BC Hydro 2022) to conduct surveys in alternate years over the first 10 years of Operations. The Migratory Bird Nest Monitoring 2025 Annual Report is provided in Appendix 5.

### **6.1.4 Condition 9.9.2**

This section summarizes actions taken in accordance with the following requirement of Condition 9.9.2: *The Proponent shall address potential risks of bird collisions with the transmission line, in consultation with Environment Canada, by determining if additional mitigation measures could be implemented to reduce the risk of bird collisions.*

A risk assessment for bird collisions with the transmission line was included in Section 6.1.3 of the 2016 VWMMP Annual Report. Since that time, changes have been incorporated in the transmission line design and implemented in construction that further reduce the risk of bird collisions:

- Phase to phase spacing is more than 12 metres, preventing any electrocution hazard that exists on distribution lines;

- Conductor size is approximately 1.25" diameter, therefore easier for birds to see. Each phase of the conductor will be configured in a square-shaped bundle of four, with spacing of 0.5 metres between each conductor, thus further increasing visibility for birds.
- There are no shield wires on most of the line. Shield wires are smaller in diameter and harder for birds to see and will only be installed in the last kilometer of each end of the line.
- Water crossings of the Peace and Moberly rivers will have marker spheres on them, which will increase visibility for birds.
- Guy wires on the structures are relatively low to the ground, as they connect to the tower at 2/3 the height of the tower. The lower height of the guy wires will reduce risk to birds. The bottoms of the guy wires are marked with bright yellow plastic guards, which will increase their visibility, and further reduce risk to birds.

## **6.2 Federal Decision Statement Condition 10: Non-Wetland Migratory Bird Habitat Mitigation and Monitoring**

This section of the annual report summarizes the applicable components of the VWMMP implemented to fulfill FDS Condition 10 in 2025 in accordance with the requirements of FDS Condition 10.8. For context, the complete requirements of FDS Condition 10 are shown below.

<b>10. Non-wetland migratory bird habitat</b>	
10.1.	The Proponent shall mitigate the potential effects of the Designated Project on non-wetland migratory bird habitat.
10.2.	The Proponent shall develop, in consultation with Environment Canada, a plan that addresses potential effects of the Designated Project on non-wetland migratory bird habitat.
10.3.	The plan shall include: <ul style="list-style-type: none"> <li>10.3.1. non-wetland migratory bird habitat baseline conditions for habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact;</li> <li>10.3.2. migratory bird abundance, distribution and use of non-wetland habitat;</li> <li>10.3.3. measures to mitigate the changes in aquatic and riparian-related food resources and other habitat features associated with a change from a fluvial to a reservoir system;</li> <li>10.3.4. compensation measures to address the unavoidable loss of non-wetland migratory bird habitat, including habitat associated with the Canada Warbler, the Cape May Warbler and the Bay-Breasted Warbler;</li> <li>10.3.5. an analysis of the effects of any compensation measures identified in Condition 10.3.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples; and</li> <li>10.3.6. an approach to monitor and evaluate the effectiveness of the mitigation or compensation measures to be implemented and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory bird habitat, including migratory bird use of that habitat.</li> </ul>
10.4.	The Proponent shall submit to the Agency and Environment Canada a draft copy of the plan for review: <ul style="list-style-type: none"> <li>10.4.1. for Conditions 10.3.1, 10.3.2, 10.3.3 and 10.3.6, 90 days prior to initiating construction; and</li> <li>10.4.2. for Conditions 10.3.4 and 10.3.5, 90 days prior to implementing any component of the compensation plan.</li> </ul>
10.5.	The Proponent shall submit to the Agency the final plan: <ul style="list-style-type: none"> <li>10.5.1. for Conditions 10.3.1, 10.3.2, 10.3.3 and 10.3.6, a minimum of 30 days prior to initiating construction; and</li> <li>10.5.2. for Conditions 10.3.4 and 10.3.5, a minimum of 30 days prior to implementing any</li> </ul>

component of the compensation plan.

- 10.6. When submitting each component of the final plan, the Proponent shall provide to the Agency an analysis that demonstrates how it has appropriately considered the input, views or information received from Environment Canada.
- 10.7. The Proponent shall commence the implementation of the compensation measures specified in Condition 10.3.4 no later than five years from the initiation of construction.
- 10.8. The Proponent shall implement each component of the plan and provide to the Agency an analysis and summary of the implementation of the applicable component of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and at the end of year 1, 2, 3, 5, 10, 15, 20 and 30 of operation.

### **6.2.1 Conditions 10.1 and 10.2**

This section summarizes actions taken in accordance with the following requirement of Conditions 10.1 and 10.2:

*10.1. The Proponent shall mitigate the potential effects of the Designated Project on non-wetland migratory bird habitat.*

*10.2. The Proponent shall develop, in consultation with Environment Canada, a plan that addresses potential effects of the Designated Project on non-wetland migratory bird habitat.*

In 2024, BC Hydro proposed to use BC Hydro-owned properties containing suitable habitat for non-wetland migratory birds as contributions to the program by committing to retain and protect the identified habitat. Initial desktop assessment followed by field verification continued in 2025. With the completion of reservoir fill and finalization of construction activity completion reports and updated mapping, BC Hydro re-assessed the amount of non-wetland migratory bird habitat affected by the Project and also assessed the amount of non-wetland migratory bird habitat that could be offset by BC Hydro properties in compensation. On September 11, 2025, this information was presented in a Memo to IAAC and ECCC to demonstrate compliance with the conditions and to propose closing out the program. The Memo outlining this approach, to which no comments were received in 2025, is provided in Appendix 6.

In addition, BC Hydro owns four properties (i.e., Marl Fen, Rutledge, Wilder Creek and Tompkins) that were retained partly to provide habitat for non-wetland migratory birds. These properties comprise three land parcels totaling 637 ha for Marl Fen, five parcels totaling 208 ha for Rutledge, seven parcels totaling 423 ha for Wilder Creek, and 11 parcels totaling 453 ha for Tompkins. Collectively these parcels are being managed for values for rare plants and wildlife, including UWR and non-wetland migratory bird habitat. Management plans for three of these properties (Marl Fen, Rutledge, Wilder Creek) were initially included in the 2015 annual report. Updates to these three management plans were provided in the 2024 VWMMP Annual Report as Appendices 4, 5, 6, respectively (BC Hydro 2025). These three plans were updated again in 2025 and can be found as Appendices 7, 8, and 9, respectively in this report. A new management plan was developed for the Tompkins property in 2025 and is provided in Appendix 10.

### **6.2.2 Condition 10.3.1**

This section summarizes actions taken in accordance with the following requirement of Condition 10.3.1: *The plan shall include non-wetland migratory bird habitat baseline conditions for habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact.*

As discussed in Section 6.2.1 above, in 2025 with the completion of reservoir fill and finalization of construction activity completion reports and updated mapping, BC Hydro re-assessed the amount of non-wetland migratory bird habitat affected by the Project and also assessed the amount non-wetland migratory bird habitat that could be offset by BC Hydro properties in compensation. On

September 11, 2025, this information was presented in a Memo to IAAC and ECCC to demonstrate compliance with the conditions and to propose closing out the program. The Memo outlining this approach, to which no comments were received in 2025, is provided in Appendix 6.

### **6.2.3 Condition 10.3.2**

This section summarizes actions taken in accordance with the following requirement of Condition 10.3.2: *The plan shall include migratory bird abundance, distribution, and use of non-wetland habitat.*

The collection of data on non-wetland migratory bird abundance, distribution and use of non-wetland habitat is done through implementation of the migratory bird monitoring plans, of which the 2025 surveys are discussed in Section 6.1.3 in relation to FDS Condition 9.3 (monitor and mitigate potential disturbance of breeding migratory birds).

### **6.2.4 Condition 10.3.3**

This section summarizes actions that are being taken in accordance with the following requirement of Condition 10.3.3: *The plan shall include measures to mitigate the changes in aquatic and riparian-related food resources and other habitat features associated with a change from a fluvial to a reservoir system.*

Mitigation measures were developed to reduce potential adverse impacts associated with a change from a fluvial to a reservoir system by increasing the area of shallow water habitat at along the reservoir shoreline. These measures are expected to enhance fish habitat and also benefit migratory birds by increasing the abundance and availability of aquatic plants, aquatic invertebrates, and fish.

All habitat enhancements listed in the Fisheries and Aquatic Habitat Management Plan<sup>4</sup> were completed in 2023. Annual reports describing the status of implementation of these enhancements are available on the Site C Project website<sup>5</sup>.

### **6.2.5 Condition 10.3.4**

This section summarizes actions taken in accordance with the following requirement of Condition 10.3.4: *The plan shall include compensation measures to address the unavoidable loss of non-wetland migratory bird habitat, including habitat associated with the Canada Warbler, the Cape May Warbler and the Bay-Breasted Warbler.*

As discussed in Section 6.2.1 above, in 2024, BC Hydro proposed to use BC Hydro-owned properties containing suitable habitat for non-wetland migratory birds as contributions to the program by committing to retain and protect the identified habitat. These properties also contain habitat for these three bird species. With the completion of reservoir fill and finalization of construction activity completion reports and updated mapping, BC Hydro re-assessed the amount of non-wetland migratory bird habitat affected by the Project and also assessed the amount non-wetland migratory bird habitat that could be offset by BC Hydro properties in compensation. This included assessment of habitat lost and gained specifically for the three warbler species. On September 11, 2025, this information was presented in a Memo to IAAC and ECCC to demonstrate compliance with the conditions and to propose closing out the program. The Memo outlining this approach, to which no comments were received in 2025, is provided in Appendix 6.

In addition, BC Hydro owns four properties (i.e., Marl Fen, Rutledge, Wilder Creek and Tompkins) that were retained partly to provide habitat for non-wetland migratory birds. These properties

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<sup>4</sup>BC Hydro. 2015. Fisheries and Aquatic Habitat Management Plan. Site C Clean Energy Project. Revision 1: June 1, 2015. Available at:

[https://www.sitecproject.com/sites/default/files/Fisheries\\_and\\_Aquatic\\_Habitat\\_Management\\_Plan.pdf](https://www.sitecproject.com/sites/default/files/Fisheries_and_Aquatic_Habitat_Management_Plan.pdf).

<sup>5</sup>Available at: <https://www.sitecproject.com/document-library/environmental-and-socio-economic-plans-and-reports>

comprise three land parcels totaling 637 ha for Marl Fen, five parcels totaling 208 ha for Rutledge, seven parcels totaling 423 ha for Wilder Creek, and 11 parcels totaling 453 ha for Tompkins. Collectively these parcels are being managed for values for rare plants and wildlife, including UWR and non-wetland migratory bird habitat. Management plans for three of these properties (Marl Fen, Rutledge, Wilder Creek) were initially included in the 2015 annual report. Updates to these three management plans were provided in the 2024 VWMMP Annual Report as Appendices 4, 5, 6, respectively (BC Hydro 2025). These three plans were updated again in 2025 and can be found as Appendices 7, 8, and 9, respectively in this report. A new management plan was developed for the Tompkins property in 2025 and is provided in Appendix 10.

### 6.2.6 Condition 10.3.5

This section summarizes actions taken in accordance with the following requirement of Condition 10.3.4: *The plan shall include an analysis of the effects of any compensation measures identified in condition 10.3.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples.*

To date, compensation measures to address the unavoidable loss of non-wetland migratory bird habitat have been restricted to fee simple lands. Compensation actions enacted on fee simple lands are not expected to affect current use of lands and resources for traditional purposes by Indigenous peoples. Access to fee simple lands is controlled by the owner, or, in the case of BC Hydro, the leaseholder of lands leased by BC Hydro.

### 6.2.7 Condition 10.3.6

This section summarizes actions taken in accordance with the following requirement of Condition 10.3.6: *The plan shall include an approach to monitor and evaluate the effectiveness of the mitigation or compensation measures to be implemented and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory bird habitat, including migratory bird use.*

An approach to monitor the effectiveness of mitigation and compensation measures and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory birds is done within the migratory bird monitoring plans. The migratory bird monitoring surveys conducted in 2025 are discussed in Section 6.1.3 in relation to FDS Condition 9.3 (monitor and mitigate potential disturbance of breeding migratory birds).

## 6.3 Federal Decision Statement Condition 11: Wetland Mitigation and Monitoring

This section of the annual report summarizes the components of the VWMMP implemented to fulfill FDS Condition 11 in 2025 in accordance with the requirements of FDS Condition 11.9. For context, the complete requirements of FDS Condition 11 are listed below.

<b>11.</b>	<b>Wetlands used by migratory birds and for current use of lands and resources for traditional purposes</b>
11.1	The Proponent shall mitigate the potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes by Aboriginal people.
11.2.	The Proponent shall develop, in consultation with Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups, a plan that addresses potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes.
11.3.	The Proponent shall, in developing the plan, describe how the mitigation hierarchy and the objective of no net loss of wetland functions were considered.

- 11.4. The plan shall include:
- 11.4.1. baseline data on the biogeochemical, hydrological and ecological functioning of the wetlands and associated riparian habitat in the area affected by the Designated Project, including: ground and surface water quality and quantity; vegetation cover; biotic structure and diversity; migratory bird abundance, density, diversity and use; species at risk abundance, density, diversity and use; and current use of the wetlands for traditional purposes by Aboriginal people, including the plant and wildlife species that support that use;
  - 11.4.2. mitigation measures to maintain baseline wetland functions for those wetlands that will not be permanently lost;
  - 11.4.3. an approach to monitor and evaluate any changes to baseline conditions, as defined in condition 11.4.1 and identify improvements based on monitoring data;
  - 11.4.4. compensation measures to address the unavoidable loss of wetland areas and functions supporting migratory birds, species at risk, and the current use of lands and resources by Aboriginal people in support of the objective of full replacement of wetlands in terms of area and function; and
  - 11.4.5. an analysis of the effects of any compensation measures identified in condition 11.4.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples.
- 11.5. The Proponent shall submit to the Agency, Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups a draft copy of the plan for review:
- 11.5.1. for Conditions 11.4.1, 11.4.2 and 11.4.3, 90 days prior to initiating construction; and
  - 11.5.2. for Conditions 11.4.4 and 11.4.5, 90 days prior to implementing any component of the compensation plan.
- 11.6. The Proponent shall submit to the Agency the final plan:
- 11.6.1. for Conditions 11.4.1, 11.4.2 and 11.4.3, a minimum of 30 days prior to initiating construction; and
  - 11.6.2. for Conditions 11.4.4 and 11.4.5, a minimum of 30 days prior to implementing any component of the compensation plan.
- 11.7. When submitting each component of the final plan, the Proponent shall provide to the Agency an analysis that demonstrates how it has appropriately considered the input, views or information received from Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups.
- 11.8. The Proponent shall commence the implementation of the compensation measures specified in condition 11.4.4 no later than five years from the initiation of construction.
- 11.9. The Proponent shall implement each component of the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and at the end of year 1, 2, 3, 5, 10, 15, 20 and 30 of operation.

### 6.3.1 Condition 11.1

This section summarizes actions taken in accordance with the following requirement of Condition 11.1: *The Proponent shall mitigate the potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes by Aboriginal people.*

The CEMP (Section 4.5) states that riparian habitat is to be protected by retaining “a 15 m machine-free riparian buffer from the Ordinary High Water Mark of watercourses and waterbodies during clearing, except where worker safety prohibits manual tree falling and vegetation removal methods, and as addressed in a site specific prescription prepared and endorsed by a QEP.” The CEMP (Section 4.5) also requires that lay-down and material storage areas be located “at least 15 m from the Ordinary High Water Mark.”

The location and boundaries of wetland habitats near construction areas were field-truthed, their boundaries flagged, and coordinates recorded using GPS. This information was also used when determining the location of access roads that were used to construct the transmission line.

Mitigation for loss of wetland habitat was achieved through various means.

Through a partnership with DUC, BC Hydro provided funding to rebuild aging water control infrastructure. Due to the costs involved to maintain and rebuild these structures, DUC was unable to continue funding for their management. As a result, under their respective water licenses, DUC would be required to decommission infrastructure at several wetlands in BC since 2009, returning those wetlands to approximately pre-construction conditions and losing functional wetland area. BC Hydro provided funding to DUC to rebuild aging water control infrastructure which saved wetlands from being lost, thereby meeting international best practice standards for biodiversity offsets. In 2025, DUC continued to identify historically constructed wetlands that were nearing the end of the 30-year water control infrastructure lifespan within the Peace and Omineca Regions to apply as wetland offsets for Site C.

In 2019, DUC conducted the physical works necessary at Golata Canyon Ranch to create approximately 50 ha of sedge wetland. The development of this wetland area, as vegetation establishes and wetland functions increase, continues to be monitored.

The Scott Lake restoration project was completed in 2023 which added 26.5 ha to the program. With Golata, water control infrastructure installation at three wetlands rebuilt by DUC in 2022 (Doig Beatton East, Doig Beatton West, Cutbank Lake) and one in 2023 (Scott Lake), represents about 269.5 ha of wetland area that would otherwise have been lost.

In 2024, BC Hydro worked with DUC to develop the Site C Area A reclamation wetland which continued throughout 2025 and will add approximately 38 ha to the program by completion in late 2026. In total, the wetland compensation opportunities that have been constructed or identified for Site C currently total an estimated 304 ha of wetland based on the past wetland projects and the 34.4 ha of wetlands that have been completed to date in Area A. Once Area A is completed by the end of 2026, an additional 3.7 ha will be created resulting in a final compensation total of 307.6 ha (see Wetland Mitigation and Compensation Plan in Appendix 11).

In addition, BC Hydro continues to manage the Marl Fen property, which was retained in part to protect the Marl Fen wetland located on the property. The management plan for that property was updated in 2025 and is included as Appendix 7.

### **6.3.2 Condition 11.2**

This section summarizes actions taken in accordance with the following requirement of Condition 11.2: *The Proponent shall develop, in consultation with Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups, a plan that addresses potential effects of the Designated Project on wetland habitat used by migratory birds, species at risk and for current use of lands and resources for traditional purposes.*

Potential effects of the Project on wetland habitat were addressed within a wetland mitigation and compensation plan, which had the objective of no net loss of wetland functions, as per FDS Condition 11.3 (see Section 6.3.3 below). In 2025, BC Hydro compiled detailed explanations of the various wetland mitigation and compensation approaches taken for Site C and produced a finalized Site C Wetland Mitigation and Compensation Plan, which is provided in Appendix 11.

### **6.3.3 Condition 11.3**

This section summarizes actions taken in accordance with the following requirement of Condition 11.3: *The Proponent shall, in developing the plan, describe how the mitigation hierarchy and the objective of no net loss of wetland functions were considered.*

Through consultation with and review by MOECCS, MWLRS, and CWS through the VWTC, BC Hydro developed the Wetland Function Assessment (WFA) tool to measure progress towards the objective of no net loss of wetland functions. The WFA assesses the unavoidable loss of wetland area and function that supports migratory birds, amphibians, bats, species at risk, and species important to Indigenous land use due to Project activities. In assessing the loss of wetland area and function, the WFA process informs compensation measures for full replacement of wetland area and function. Wetland function is defined as the natural processes that are associated with wetlands but does not refer to the benefits of those processes to humans. Details on the WFA and associated assessment are provided in the Site C Wetland Mitigation and Compensation Plan found in Appendix 11.

The mitigation hierarchy has three main steps, as outlined in the Environment Canada's Operational Framework for Use of Conservation Allowances (Environment Canada 2012):

- Avoid proposed impacts;
- Minimize proposed impacts; and
- Address any residual environmental effects that cannot be avoided or sufficiently minimized with the use of conservation allowances.

Measures to avoid where feasible, and to minimize impacts to wetlands where avoidance is not feasible, are described in the CEMP and the Site C Vegetation Clearing and Debris Management Plan. For residual impacts to wetlands, as described in Section 6.3.1 above, BC Hydro worked with DUC to create, restore and enhance wetlands with the objective of no net loss of wetland functions. Determining the residual impacts to wetland functions, and the appropriate amount and type of wetlands to develop as conservation allowances, was done through application of the WFA, combined with implementation of the various approaches discussed in the Site C Wetland Mitigation and Compensation Plan (see Section 6.3.2 above).

In addition, a wetland monitoring program was developed through consultation with and review by MOECCS, MLWRS, and CWS through the VWTC. The wetland monitoring program is designed to measure residual impacts to wetlands due to Site C, as well as to assess positive changes to wetland functions due to BC Hydro's efforts to create, restore and enhance wetlands. More details on the Wetland Monitoring Program are provided in Section 6.3.4 below.

In 2025, with the completion of reservoir fill and finalization of construction activity completion reports, ground-truthing, and updated mapping, BC Hydro and DUC re-assessed the amount of wetland habitat affected by the Project in terms of area and functions and applied the WFA to determine the amount of wetland habitat impacted with the amount offset by the wetland rebuilds and creation. This provided an assessment of the extent of compliance with the remaining conditions of FDS Condition 11 and EAC Condition 12 (see Section 7.3.1.1).

The WFA determined that there was an overall net gain in wetland functions resulting from the creation, rebuilding, and restoration of wetland habitats which has also resulted in no net loss of wetland area. The wetland compensation projects completed to date, along with the wetland creation work currently occurring in Area A, will achieve an overall net positive outcome in both area and function.

On July 10, 2025, this information was presented in a Memo to IAAC and ECCC to demonstrate compliance with the conditions and to propose closing out the program. The Memo outlining this assessment including the calculations that DUC used to determine it, are provided in Appendix 12.

Note: On January 21, 2026, IAAC stated that they cannot provide formal confirmation of compliance with nor approve an approach for BC Hydro's wetland mitigation and compensation program;

responsibility for compliance rests with the Proponent. As such, on February 13, 2026, BC Hydro closed out the program based on the determination that the Wetland Mitigation and Compensation Program:

- Achieved full implementation of all physical compensation measures.
- Replaced wetland area and functions to the extent practical under the no-net-loss objective.
- Considered all stakeholder input as required under FDS 11.7.
- Received no additional review comments from the EAO and no outstanding obligations from IAAC aside from monitoring.

The only remaining component is long-term reporting under FDS 11.9, which continues until Year 30 of operations.

#### **6.3.4 Condition 11.4**

##### **6.3.4 Condition 11.4.1**

This section summarizes actions taken in accordance with the following requirement of Condition 11.4.1: *The plan shall include baseline data on the biogeochemical, hydrological and ecological functioning of the wetlands and associated riparian habitat in the area affected by the Designated Project, including: ground and surface water quality and quantity; vegetation cover; biotic structure and diversity; migratory bird abundance, density, diversity and use; species at risk abundance, density, diversity and use; and current use of the wetlands for traditional purposes by Aboriginal people, including the plant and wildlife species that support that use.*

Baseline data on the biogeochemical, hydrological and ecological functioning of wetlands and associated riparian habitat were collected during baseline surveys in support of the EIS, and subsequent surveys of wetlands, including those impacted by the transmission line right-of-way (RoW).

A wetland monitoring program was also developed through consultation with and review by MOECCS, MLWRS, and CWS through the VWTC. The Program consists of two components: baseline wetland monitoring, which is focused on gathering information on the physical, ecological, biogeochemical, and hydrological conditions of wetlands prior to construction activities; and wetland monitoring during construction and operations, which focuses on gathering information to evaluate changes from baseline conditions due to Project activities.

Based on the requirements for wetland monitoring described in FDS Condition 11, the monitoring program was developed to comprise the following:

- Collection of baseline data on the biogeochemical, hydrological and ecological functioning of the wetlands and associated riparian habitat in the area affected by the Project;
- An evaluation of change to baseline wetland conditions due to the Project;
- Selection of compensation measures for loss of wetland areas and functions, including reclamation, improvement, creation and protection; and
- Flexibility in the monitoring program to allow for further refinement in the characterization of baseline and affected wetlands, as data become available.

The monitoring program includes direct measures of groundwater quality and quantity, surface water quality and quantity, vegetation cover, structure and diversity, and rare plant occurrence.

Groundwater monitoring wells were installed in 2020 using a sampling design to complement the larger wetland monitoring program. That design specified that three groundwater monitoring wells be established at each of two Sedge Wetlands (SE) un-impacted by Project activities and two SE

wetlands impacted by the clearing of surface vegetation along the transmission line on the plateau, from the wettest part of the wetland to the surrounding upland ecosystem.

In 2025, water quantity and quality were monitored three times annually. Both shallow drive points and auger-drilled wells were installed at four locations under wet conditions; however, the subsequent multi-year drought has resulted in very low water levels. Consequently, the previously wetted areas were dry during most monitoring events.

Of the 32 wells, 16 consistently had issues – either being dry, having insufficient water to sample, or not holding enough water to operate a level logger effectively. Two PVC wells lacking casing were broken off at ground level, and two metal-cased wells experienced frost heave, resulting in one well becoming disconnected halfway down and another being lifted out of its sand pack. It was observed that several wells were missing casing, and 2-3 monitoring wells would routinely be missing caps. BC Hydro replaced these as needed and documented accordingly.

As a result, only 10 wells were sampled in 2022. In 2023, only seven wells contained enough water to sample, and by 2024 this number had dropped to five or six.

The lack of water in the monitoring wells is consistent with what has been observed in the larger wetland monitoring program. During the operation and construction monitoring, many of the wetlands have been dry and surface water samples could not be collected. In 2025 only two wetlands contained enough water to sample, compared to 18 water samples collected in 2020, and five in 2022. Many wetlands appear to be in a drying trend with an ingrowth of shrubs and a reduction in aquatic vegetation (including some wetlands that were cleared, but do not have any Project-related hydrological alterations such as roads, ditches, etc.).

Continuing groundwater monitoring at selected wetlands along the transmission line will require substantial maintenance efforts. Regardless of maintenance, the existing groundwater wells are not providing a complete set of annual data due to the apparent effects of a prolonged drought that has also been observed in the larger wetland monitoring program. Monitoring for impacts to wetlands along the transmission line will continue using vegetation and surface water data collection. Since the groundwater monitoring program has not provided enough meaningful data since its inception in 2020 and is not likely to contribute information useful for the broader wetland monitoring program nor indicate any project-related effects, we propose to discontinue it and focus efforts instead on the broader wetland monitoring program.

The wetland monitoring program also includes wetland delineation to help evaluate and improve wetland mapping. Further data on biotic structure and diversity, and migratory bird and species at risk abundance, density, diversity and use is being gathered through the focused monitoring programs (e.g., waterbird surveys). Baseline data regarding current use of wetlands for traditional purposes by Aboriginal people have been gathered by the BC Hydro Indigenous Relations team through ground-truthing with First Nation groups, who have also been gathering and compiling data regarding changes to use of wetlands for traditional purposes.

The 2025 wetland monitoring field program focused on the construction phase monitoring of wetlands that were sampled in 2020. A total of 20 wetlands were sampled in 2025, with all sites located along the transmission line. Data on the physical, ecological, biogeochemical, and hydrological conditions collected at each of the 2025 wetlands are presented in the report which is in Appendix 13.

The 2025 wetland program marks the start of operations monitoring which will occur again in 2026 and 2027. After the 2027 monitoring program, all wetlands will have been assessed three times, including the baseline assessments and two and five-year assessment, which should allow for an analysis of change in wetland parameters and a determination of the need to continue monitoring each wetland (i.e., if change is not present and/or not ongoing, then further monitoring is not likely to

result in useful additional data). As 2025 was the first year of construction monitoring, no conclusions could be made regarding the impact of Project effects on wetlands.

#### **6.3.5 Condition 11.4.2**

This section summarizes actions taken in accordance with the following requirement of Condition 11.4.2: *The plan shall include mitigation measures to maintain baseline wetland functions for those wetlands that will not be permanently lost.*

For wetlands that were not permanently lost, wetland function was maintained through the timing of works (e.g., in winter to minimize ground disturbance), maintenance of hydrology through the installation of culverts during road construction as a matter of practice, and approaches to minimize impacts to wetlands through careful construction practices (see CEMP Section 4.5). The WFA tool and the associated wetland monitoring program were designed together to identify impacts to wetlands and wetland functions, which then helped to inform quantitative wetland compensation objectives (see Sections 6.3.3 and 6.3.4).

#### **6.3.6 Condition 11.4.3**

This section summarizes actions taken in accordance with the following requirement of Condition 11.4.3: *The plan shall include an approach to monitor and evaluate any changes to baseline conditions, as defined in condition 11.4.1 and identify improvements based on monitoring data.*

See section 6.3.4 above for discussion of monitoring and evaluating changes to baseline wetland conditions, as defined in Condition 11.4.1, and for identifying improvements based on monitoring data.

#### **6.3.7 Condition 11.4.4**

This section summarizes actions taken in accordance with the following requirement of Condition 11.4.4: *The plan shall include compensation measures to address the unavoidable loss of wetland areas and functions supporting migratory birds, species at risk, and the current use of lands and resources by Aboriginal people in support of the objective of full replacement of wetlands in terms of area and function.*

Please see Sections 6.3.1 to 6.3.3 for details on wetland mitigation and the WFA tool.

#### **6.3.8 Condition 11.8**

This section summarizes actions taken in accordance with the following requirement of Condition 11.8: *The Proponent shall commence the implementation of the compensation measures specified in Condition 11.4.4 no later than five years from the initiation of construction.*

Please refer to Section 6.3.1 for details on implementation of wetland compensation measures that have been implemented since the first year of construction and are ongoing.

#### **6.3.9 Condition 11.9**

This section summarizes actions taken in accordance with the following requirement of Condition 11.9: *The Proponent shall implement each component of the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and at the end of year 1, 2, 3, 5, 10, 15, 20 and 30 of operation.*

This annual report represents an analysis and summary of the implementation of the plan, as well as amendments made to the plan through the ongoing development of component mitigation and monitoring plans based on survey results and consultation with CWS, MWLRS, and MOECCS.

## 6.4 Federal Decision Statement Condition 16: Species at Risk Mitigation and Monitoring

This section of the annual report summarizes the programs as implemented in 2025 in accordance with the requirements of FDS Condition 16.6.

For context, the complete requirements of FDS Condition 16 are listed below.

<p><b>16. Species at risk, at-risk and sensitive ecological communities and rare plants</b></p> <p>16.1. The Proponent shall ensure that potential effects of the Designated Project on species at risk, at-risk and sensitive ecological communities and rare plants are addressed and monitored.</p> <p>16.2. The Proponent shall develop, in consultation with Environment Canada, a plan setting out measures to address potential effects of the Designated Project on species at risk, at-risk and sensitive ecological communities and rare plants.</p> <p>16.3. The plan shall include:</p> <p>16.3.1. field work to verify the modeled results for surveyed species at risk and determine the habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact for those species, including the Short-eared Owl, the Western Toad and the Myotis Bat species;</p> <p>16.3.2. surveys to determine whether the rare plant species potentially facing extirpation in the Project Activity Zone are found elsewhere in the region;</p> <p>16.3.3. measures to mitigate environmental effects on species at risk and at-risk and sensitive ecological communities and rare plants;</p> <p>16.3.4. conservation measures to ensure the viability of rare plants, such as seed recovery and plant relocation;</p> <p>16.3.5. an approach to avoiding or minimizing the use of herbicides and pesticides in areas that could impact species at risk, at-risk and sensitive ecological communities and rare plants;</p> <p>16.3.6. an approach to monitor and evaluate the effectiveness of mitigation measures and to verify the accuracy of the predictions made during the environmental assessment on species at risk, at-risk and sensitive ecological communities and rare plants; and</p> <p>16.3.7. an approach for tracking updates to the status of listed species identified by the Government of British Columbia, Committee on the Status of Endangered Wildlife in Canada, and the Species at Risk Act, and implementation of additional measures, in accordance with species recovery plans, to mitigate effects of the Designated Project on the affected species should the status of a listed species change during the life of the Designated Project.</p> <p>16.4. The Proponent shall submit to the Agency and Environment Canada a draft copy of the plan for review 90 days prior to initiating construction.</p> <p>16.5. The Proponent shall submit to the Agency the final plan a minimum of 30 days prior to initiating construction. When submitting the final plan, the Proponent shall provide to the Agency, an analysis that demonstrates how it has appropriately considered the input, views or information received from Environment Canada.</p>
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The requirements of Condition 16.1 and Condition 16.2 are addressed through Condition 16.3. Mitigation and monitoring plans are developed in consultation with the CWS of ECCC through the VWTC (Section 3.1).

### 6.4.1 Condition 16.3.3

This section summarizes actions taken in accordance with the following requirement of Condition 16.3.3: *The plan shall include measures to mitigate environmental effects on species at risk and at-risk and sensitive ecological communities and rare plants.*

In 2025 the following measures were implemented to mitigate effects on species at risk and at-risk and sensitive ecological communities and rare plants:

- Amphibian mitigation through salvages and dispersal translocation (Section 6.4.1.2);
- Implementation of protection measures for wetland and riparian areas, in which rare plant occurrences are generally concentrated, as required by the CEMP (See Section 6.3.1);
- Further implementation of the Experimental Rare Plant Translocation program in consultation with MOECCS, MLWRS, and CWS (Sections 7.1.6, 7.4.1 and 7.4.2); and
- Avoidance of bat hibernacula and maternity roosts at Portage Mountain, and the construction and installation of bat boxes on the north side of the Peace River. The 2017 VWMMP Annual Report described how impacts to hibernacula at Portage Mountain were avoided. Monitoring of bat activity at Portage Mountain began in 2017 for evaluating the effectiveness of mitigation. Ongoing monitoring of bat activity at Portage Mountain is described in Section 6.4.3.3.

#### **6.4.1.1 Pre-construction Rare Plant Surveys**

Pre-construction rare plant surveys were no longer required since Project construction was completed and the reservoir filled in fall of 2024. The first season of pre-construction surveys was completed in the summer and fall of 2015 and was conducted annually until 2024. The methods and results from surveys conducted from 2015 through 2024 were provided in Appendix 7 of the 2024 VWMMP Annual Report.

The data collected during that period helped to inform mitigation to avoid or minimize impacts to rare plant occurrences near construction sites and identify potential propagule sources and recipient host sites for the Experimental Rare Plant Translocation Program (see Sections 7.1.6, 7.4.1 and 7.4.2).

#### **6.4.1.2 Amphibian Dispersal Mitigation and Salvage**

Mitigation for minimizing the impacts of the Project on amphibians and amphibian habitat is required from contractors and specified in part in Section 4.17 and Appendix L of the CEMP. Those mitigations include the following:

- Limit vegetation clearing and avoid road construction in identified amphibian breeding and migration areas, where feasible;
- If construction is required adjacent to any identified amphibian breeding and migration areas, implement appropriate barriers and set-back buffers around the sites in accordance with aquatic and riparian protection measures (i.e., retain a 15 m machine-free riparian buffer from the Ordinary High Water Mark of watercourses and waterbodies during clearing, except where worker safety prohibits manual tree falling and vegetation removal methods, and as addressed in a site specific prescription prepared and endorsed by a QEP [see Section 4.5 of the CEMP]; and avoid where feasible, including through the use of disturbance setback buffers);
- Install crossing structures for amphibians and snakes to avoid and reduce injury and mortality to amphibians on roads that cross or are immediately beside wetland or other areas where amphibians or snakes are known to migrate across roads in accordance with Section 8.8 of the VWMMP. Notify BC Hydro of such installations within 5 days of installation; and
- Implement amphibian salvage and translocation procedures as required. Amphibian salvages could be required when avoidance of areas containing metamorphosing tadpoles cannot be avoided, or prior to the destruction of wetlands supporting amphibians (Wildlife Act Permit FJ24-896288, valid December 4, 2024 to December 31, 2026). Amphibian

translocation may be required when mass migration events cross access roads and work sites.

It is necessary for each contractor's QEP to conduct amphibian breeding and migration area surveys in advance of ground disturbing activities and alongside active construction roads, where and when appropriate, to determine appropriate mitigation. Revision 5 of the CEMP includes an explicit requirement for each Contractor and its QEP to follow the Western Toad Management Procedure wherever western toads may exist. The Western Toad Management Procedure was developed through extensive consultation with MLWRS (now MWLRS), MOECCS and CWS through the VWTC, and can be found in Appendix 6 of the 2017 Annual Report and is Appendix L of the CEMP. This procedure was finalized June 26, 2017, and since that time has been required for inclusion in all contractors' Environmental Protection Plans (EPPs) for works that could impact amphibians. Appropriate amphibian mitigation is monitored by BC Hydro site Environmental Monitors and the Independent Environmental Monitor (IEM) against commitments within EPPs and CEMP requirements to determine and enforce compliance.

The Western Toad Management Procedure is applicable during construction on access roads, the transmission line, and areas within 250 m of wetlands. It requires daily surveys of all access roads and work sites during the 'core dispersal period' of June 1 to August 15. During the 'caution dispersal periods' of April 1 to May 31 and August 16 to September 30, the protocol requires a minimum of weekly surveys, as well as surveys before travelling to site and before any work commences. The protocol includes a stop work procedure at access roads or construction sites if dispersing toads are confirmed within 20 m of those areas, as well as a requirement for installing temporary barrier fences to prevent toads from being exposed to an increased mortality risk. Trapped toads are then to be translocated safely across work areas in the direction of their dispersal.

#### **6.4.2 Condition 16.3.4**

This section summarizes actions taken in accordance with the following requirement of Condition 16.3.4: *The plan shall include conservation measures to ensure the viability of rare plants, such as seed recovery and plant relocation.*

The Experimental Rare Plant Translocation (ERPT) program was developed in consultation with MOECCS, MLWRS (now MWLRS), and CWS through the VWTC (see Section 7.4.1 and 7.4.2). In 2025, no *in-situ* seed collection occurred; however, Canada mountain-ricegrass (*Piptatheropsis canadensis*) seed was collected *ex-situ* to support future propagation. Propagation efforts focused on priority rare plant species. Sixty-one individuals representing three focal species were translocated to three sites in June 2025 (see Section 7.1.6). The 2025 ERPT final report is in Appendix 14.

#### **6.4.3 Condition 16.3.6**

This section summarizes actions taken in accordance with the following requirement of Condition 16.3.6: *The plan shall include an approach to monitor and evaluate the effectiveness of mitigation measures and to verify the accuracy of the predictions made during the environmental assessment on species at risk, at-risk and sensitive ecological communities and rare plants.*

##### **6.4.3.1 Migratory Bird Monitoring**

Please see Section 6.1.3 for a summary of migratory bird surveys conducted in 2025. These monitoring programs are designed to meet a number of objectives, including to monitor and evaluate the effectiveness of mitigation measures and to verify the accuracy of predictions made during the environmental assessment regarding migratory bird species at risk. Numerous migratory species observed in those surveys are provincially and / or federally listed. The 2025 Annual Report for

songbird surveys can be found in Appendix 1. Colonies of the SARA-Threatened Bank Swallow were also surveyed and monitored with reports provided in Appendices 2 and 3.

#### **6.4.3.2 Ground-nesting Raptor Surveys**

Ground-nesting raptor surveys were conducted in 2025 to monitor and evaluate the effectiveness of mitigation measures and to verify the accuracy of predictions made during the environmental assessment on ground nesting raptors, such as short-eared owl (see Section 7.8.4.2). Short-eared owl is a ground-nesting raptor that is provincially Blue-listed, is listed as Threatened by COSEWIC, and listed as Special Concern on Schedule 1 of SARA. The 2025 Annual Report for Ground-nesting raptor monitoring is provided in Appendix 15.

#### **6.4.3.3 Bat Mitigation and Monitoring**

To avoid destroying hibernacula at Portage Mountain that may be used by little brown myotis and northern myotis (both of which are federally listed as Endangered on Schedule 1 of SARA), BC Hydro redesigned the Portage Mountain Quarry to the eastern edge of the License of Occupation area. This relocation achieved a 300 m no activity/no access buffer around the 16 documented potential hibernacula. To avoid disturbance to hibernating bats, BC Hydro has also prohibited blasting at Portage Mountain between September 15 and May 15 (see Section 4.2 of the CEMP); this window was established based on data collected at the hibernacula in 2013 and in consultation with bat biologists. This mitigation is summarized in detail in Appendix 8 of the 2016 Annual Report.

To prevent damaging rock structures associated with the hibernacula, MOE<sup>6</sup> recommends noise levels during blasting be kept below certain thresholds at the hibernacula (see Section 7.7.3). BC Hydro conducted noise modelling for blasting at Portage Mountain, which predicted that noise levels at the hibernacula would be below those thresholds.

BC Hydro monitored the noise and vibration caused by activity at Portage Mountain Quarry in 2018 through 2021, which included blasting for haul road construction and aggregate production. Noise monitoring conducted at the site determined that in 2018, 2019 and 2021, noise and vibration caused by blasting did not exceed thresholds at hibernacula locations, as defined in BC MOE Best Management Practices (BMP) Guidelines for Bats in British Columbia (i.e., air overpressure of less than 150 decibels, shock wave less than 15 p.s.i., and peak particle velocity [PPV] less than 15 mm/second; BC MOE 2016). In 2020, noise monitoring was conducted monthly, and so modelling was used to supplement available data. That modelling of noise and vibration showed that also in 2020 blasting was unlikely to have exceeded the BC BMP thresholds for noise or vibration at important bat habitat. Four blasting events occurred at Portage Mountain on September 2, 4, 8, and 14, 2023. No blasting was conducted in 2025 as the site was undergoing reclamation.

BC Hydro is continuing to conduct year-round monitoring of bat activity at Portage Mountain, with the following objectives:

- confirm that the bat species previously recorded at Portage Mountain remain present;
- evaluate any changes in the use of the artificial hibernacula established at Portage Mountain through bat activity recorded during the winter and spring-emergence periods;
- evaluate and changes in the use of Portage Mountain by bats by comparing bat activity to previously recorded spring to fall bat activity based on previously monitoring studies conducted at Portage Mountain; and
- help determine whether maternity roosts are present or being established within the artificial hibernacula through emergence counts and bioacoustic monitoring.

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<sup>6</sup>BC MOE. 2016. Best Management Practices Guidelines for Bats in British Columbia. Chapter 2: Mine Developments and Inactive Mine Habitats. 68 pp.

Analysis of bat activity data from acoustic detectors and bat emergence counts conducted at Portage Mountain between 2016 to 2023 indicate that bats continue to actively use habitat at Portage Mountain. This included detection of the endangered little brown and Northern myotis with the highest frequency from 2021 to 2023. The big brown & silver-haired bat species groups were detected at the second highest frequency from 2021 to 2023 as well. Comparatively, in contrast, big brown bats were the most commonly detected species at the sentinel sites. This information was reported in the Portage Mountain Bat Studies: 2023 Annual Report which was included as Appendix 8 in the 2023 VWMMP Annual Report.

In 2023, BC Hydro constructed three artificial bat hibernacula at the Portage Mountain Quarry site by drilling holes at least 3 m deep in rock faces on warm aspects that were inaccessible to predators. Small charges were used within the drill holes to create rock fractures to provide a range of microclimatic conditions and insulation for overwintering bats. A fourth hibernaculum using a culvert design as per the recommendation of the bat SME, was completed in 2024. The report describing the design and construction details of all four artificial bat hibernacula established at Portage Mountain is in Appendix 11 of the 2024 VWMMP Annual Report.

A more detailed assessment of the acoustic data from bat detectors, collected continuously from 2017 to 2023 at Portage Mountain and from 2020 to 2023 at sentinel sites, was analyzed to compare bat activity between the two locations. In general, the findings indicated that implementation of the spatial and temporal mitigation measures that exceeded provincial BMPs at Portage Mountain appear to have successfully supported the ongoing use of the Portage Mountain bluffs by bats. This was further supported by the statistically significant increase in detections of big brown and silver-haired bat species groups and myotis bats in the June-July period following operations. This detailed assessment was finalized after release of the 2023 VWMMP Annual Report, so was included as Appendix 10 in the 2024 VWMMP Annual Report. The bat monitoring of the natural hibernacula at Portage Mountain and the sentinel sites concluded in 2023. Further monitoring of bat hibernacula at Portage Mountain will be conducted by BC Hydro to assess the use of the four artificially-created hibernacula by bats. While the hibernacula were opened in 2025, problems occurred with the Acoustic Recording Unit (ARU) download stations so no data was retrieved to assess occupancy. This will be addressed in 2026. However, temperature loggers installed within the hibernacula indicated suitable overwintering temperatures. The 2025 Portage Mountain Artificial Bat Hibernacula Monitoring Report is provided in Appendix 16.

In addition to the 120 bat roost boxes and one large bat house installed by BC Hydro in suitable habitat near the reservoir and dam site (report included as Appendix 9 in the 2023 VWMMP Annual Report), BC Hydro will be installing 12 more bat boxes and another bat condo in the dam site in 2026 and 2027. Ten bat boxes and the condo will be installed in the Area A wetland site currently under construction (five boxes in 2026 and five in 2027) and two boxes will be installed at the new Cultural Centre when it is completed.

Monitoring of the 120 bat boxes currently established was conducted in 2025. The Bat Box Monitoring 2025 Annual report is provided in Appendix 17. Activity at all the bat box installation locations will occur annually through the first 10 years of operations of Site C.

#### **6.4.3.4. Western Toad and Gartersnake Monitoring**

The Western Toad and Gartersnake Monitoring Program was developed to identify and describe impacts to western toad and gartersnakes in wetlands downstream of Site C and implemented in 2018 through 2020. Western toad is federally listed as Special Concern under COSEWIC, SARA Schedule 1 – Special Concern but is considered not at risk in BC. Pre-operations data collection was completed in 2020, and operations data collection commenced again in 2025. The Western Toad and Gartersnake Downstream Monitoring Program 2025 Annual report is provided in Appendix 18.

#### **6.4.3.5. Wetland Function Assessment and Wetland Monitoring**

The Wetland Function Assessment was developed to characterize the impacts of the Project on wetlands in general, and specifically the ecological functions that wetlands provide. A wetland monitoring program was implemented from 2018 to 2022 to monitor and evaluate the effectiveness of wetland mitigation measures and to verify the accuracy of the predictions made during the environmental assessment (see details in Sections 6.3.3 and 6.3.4). The initial program ended in 2022, the results of which were reported in the 2022 Annual Report. Upon reservoir fill, the program recommenced in 2025. Results of the 2025 wetland monitoring program are presented in Appendix 13.

#### **6.4.3.6. Downstream Vegetation Monitoring**

The Downstream Vegetation Monitoring program was developed to document the response of downstream vegetation, at-risk and sensitive ecosystems, and rare plant occurrences between the dam and the Pine River to changes in the surface water regime during construction and operations. The program was implemented in 2019 and continued in 2020 to complete pre-river diversion (i.e., baseline) data collection. Data collection occurred in 2022 to capture the river diversion period during the mid-point of the diversion period. There was no need to collect data in 2023. Once Project operations commence, surveys are to be conducted every two years for the first 10 years and then every five years for the next 15 years. The Downstream Vegetation Monitoring 2022 annual report was included with the 2022 VWMMP Annual Report. Since reservoir fill completed in 2025, downstream vegetation monitoring will recommence in 2026.

#### **6.4.4 Condition 16.3.7**

This section summarizes actions taken in accordance with the following requirement of Condition 16.3.7: *The plan shall include an approach for tracking updates to the status of listed species identified by the Government of British Columbia, Committee on the Status of Endangered Wildlife in Canada, and the Species at Risk Act, and implementation of additional measures, in accordance with species recovery plans, to mitigate effects of the Designated Project on the affected species should the status of a listed species change during the life of the Designated Project.*

The Conservation Data Center revisions to the ranking of Species at Risk in 2025 was reviewed. The following documents were reviewed to identify changes to rankings of species documented in the Local Assessment Area (LAA) during baseline surveys<sup>7</sup>:

- 2025 BC Conservation Status Rank Review and Changes, Vascular Plants
- 2025 BC Conservation Status Rank Review and Changes, Ecological Communities
- 2025 BC Conservation Status Rank Review and Changes, Animals Summary

Species listed on Schedules 1, 2 and 3 of SARA were reviewed to determine if any species occurring in the Project area had been added or had their rankings changed.

#### **6.4.4.1 Rare Plants**

In 2025, the status of tall wood beauty (*Drymocallis arguta*) changed from Blue-listed<sup>1</sup> to Yellow-listed.

#### **6.4.4.2 Wildlife**

The SARA status listings for wildlife species likely to occur within the Site C Project area did not

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<sup>7</sup> Government of British Columbia. 2023. Recent Data Changes. <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/conservation-data-centre-updates>. Accessed: 7 March 2023.

change in 2025 nor did any of the COSEWIC classifications.

While there were no status changes, the BC Conservation Data Centre (CDC) announced a common name change to the following wildlife species with the potential to occur in the Site C Project area:

- House Wren (*Troglodytes aedon*) to Northern House Wren.

Provincially ranked species are assigned to lists based on their provincial conservation status. Species on the Red and Blue-lists are considered species at risk. Species on the yellow and unknown lists are not considered species at risk. More details and a summary of the lists can be accessed at <http://www.env.gov.bc.ca/atrisk/help/list.htm>:

<sup>1</sup>**Red:** Native species that have, or are candidates for, Extirpated, Endangered, or Threatened status in BC. Endangered species are facing imminent extirpation or extinction. Threatened species are likely to become endangered if limiting factors are not reversed. Not all Red-listed species or ecological communities will necessarily become formally designated. Placing species on these lists flags them as being at risk and requiring investigation.

**Blue:** Native species considered to be of Special Concern (formerly Vulnerable) in BC. Species of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed species are at risk, but are not Extirpated, Endangered or Threatened.

**Yellow:** Includes species that are apparently secure and not at risk of extinction. Yellow-listed species may have red- or blue-listed subspecies.

## 7.0 Mitigation and Monitoring Measures-Environmental Assessment Certificate Conditions

Conditions 9 to 12, 14 to 16, 19, 21, 23, and 24 of the Environmental Assessment Certificate, respectively, set out the mitigation and monitoring requirements for the Project's effects on vegetation and ecological communities and wildlife resources.

### 7.1 EAC Condition 9

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 9. For context, the complete requirements of Condition 9 are shown below.

#### EAC Condition 9

The EAC Holder must develop a Vegetation and Invasive Plant Management Plan to protect ecosystems, plant habitats, plant communities, and vegetation with components applicable to the construction phase.

The Vegetation and Invasive Plant Management Plan must be developed by a QEP.

The Vegetation and Invasive Plant Management Plan must include at least the following:

#### Invasive Species

- Surveys of existing invasive species populations prior to construction.
- Invasive plant control measures to manage established invasive species populations and to prevent invasive species establishment.

#### Rare Plants and Sensitive Ecosystems

- The EAC Holder must expand its modelling, including completing field work, to improve identification of rare and sensitive plant communities and aid in delineation of habitats that may require extra care, 90 days prior to any Project activities that may affect these rare or sensitive plant communities
- The EAC Holder must, with the use of a QEP, complete an inventory in areas not already surveyed and use rare plant location information as inputs to final design of access roads and transmission

lines. These pre- construction surveys must target rare plants as defined in Section 13.2.2 of the EIS—including vascular plants, mosses, and lichens.

- The EAC Holder must create and maintain a spatial database of known rare plant occurrences in the vicinity of Project components that must be searched to avoid effects to rare plants during construction activities. The database must be updated as new information becomes available and any findings of new rare plant species occurrences must be submitted to Environment Canada and MOE using provincial data collection standards.
- The EAC Holder must implement construction methods to reduce the impact to rare plants, maximize use of existing access corridors, and construct transmission towers and temporary roads away from wetlands and known rare plant occurrences.
- The EAC Holder must implement construction methods to reduce the impact to rare plants, maximize use of existing access corridors, and construct transmission towers and temporary roads away from wetlands and known rare plant occurrences.
- Protect known occurrences of Tufa seeps, wetlands and rare plants located adjacent to construction areas. Install signage and flagging where necessary, as determined by the QEP, to indicate the boundaries of the exclusion area.
- The EAC Holder will engage the services of a Rare Plant Botanist during construction to design and implement an experimental rare plant translocation program in consultation with MOE using the BC MOE's Guidelines for Translocation of Plant Species at Risk in BC (Maslovat, 2009).

The EAC Holder must provide this draft Vegetation and Invasive Plant Management Plan to Environment Canada, MFLNRO, MOE, and Aboriginal Groups for review a minimum of 90 days prior to construction and operation phases.

The EAC Holder must file the final Vegetation and Invasive Plant Management Plan with the Environmental Assessment Office (EAO), Environment Canada, MFLNRO, MOE, and Aboriginal Groups, a minimum of 30 days prior to construction and operation phases.

The EAC Holder must develop, implement and adhere to the final Vegetation and Invasive Plant Management Plan, and any amendments, to the satisfaction of EAO.

### **7.1.1 Invasive Plant Control**

BC Hydro and its contractors adhered to the invasive plant mitigation measures described in Section 4.15 of CEMP and in the Invasive Weed Mitigation and Adaptive Management Plan (IWMAMP). Numerous invasive plant control measures for the Project continued in 2024:

- invasive plant removal through hand-pulling;
- biocontrol implementation for toadflax along river road
- on-going inventories of invasive plant locations;
- hydroseeding of exposed slopes across the Project area;
- regular vehicle inspections and cleaning through various methods so that vehicles are clean and free of dirt and invasive plants when transitioning between sites and into the Project area;
- BC Hydro and contractors utilise an operational wash station on site during non-frozen conditions;
- An Invasive Species Management Contractor was sourced by BC Hydro in 2018. That contractor will provide specialized support invasive species management support on the dam site, transmission line, reservoir, Hwy 29 realignment and other off-site locations through 2024.

### **7.1.2 Inventory Areas not Already Surveyed**

This section summarizes actions taken in accordance with the following requirement of Condition 9: *The EAC Holder must, with the use of a QEP, complete an inventory in areas not already surveyed*

*and use rare plant location information as inputs to final design of access roads and transmission lines. These pre- construction surveys must target rare plants as defined in Section 13.2.2 of the EIS—including vascular plants, mosses, and lichens.*

Please see Section 6.4.1.1 for pre-construction rare plant surveys conducted in areas not already surveyed. Rare plant location data collected in 2024 was used to update the Environmental Features Map for contractors to access in their planning so that impacts to rare plants could be mitigated.

### **7.1.3 Spatial Database of Known Rare Plant Occurrences**

This section summarizes actions taken in accordance with the following requirement of Condition 9: *The EAC Holder must create and maintain a spatial database of known rare plant occurrences in the vicinity of Project components that must be searched to avoid effects to rare plants during construction activities. The database must be updated as new information becomes available and any findings of new rare plant species occurrences must be submitted to Environment Canada and MOE using provincial data collection standards.*

The Site C Environmental Features Database and Environmental Features Map was last updated with the 2022 rare plant data on 10 February 2023, when it was available to contractors for use in planning.

After the 2025 field season had ended, data was compiled and verified and submitted to the BCCDC. This dataset contained all the new rare plant occurrences found during 2025, as well as any updates and extensions to previously reported occurrences. The data was provided in a spatial format compatible with BCCDC submission requirements. Voucher specimens were prepared based on MOECCS guidelines (MOECCS 2018) and submitted to the UBC herbarium.

### **7.1.4 Rare Plant Avoidance**

This section summarizes actions taken in accordance with the following requirement of Condition 9: *The EAC Holder must implement construction methods to reduce the impact to rare plants, maximize use of existing access corridors, and construct transmission towers and temporary roads away from wetlands and known rare plant occurrences.*

General mitigation to minimize impacts to wetlands, where rare plants are often concentrated is described in Section 6.3.1.

Rare plant location data collected in 2024 were used to update the Environmental Features Map for BC Hydro and contractors to access in their planning so that impacts to known occurrences of rare plants could be mitigated in 2025.

The way that BC Hydro fulfilled this part of Condition 9 during the transmission line design phase was described in the 2015 annual report. Tower types selected are capable of supporting longer spans of conductor than those originally planned, which will reduce the overall number of towers required. Tower pad placement has been adjusted to minimize impacts to wetlands within engineering constraints. As a result, the total number of towers was reduced from 433 in the conceptual design down to 409 in the current design. The number of wetlands impacted was 102 in the conceptual design and is 64 in the current design. Occurrences of rare plants have been avoided through transmission line design and tower placement to the degree feasible.

Further practices for avoidance of rare plant occurrences are described in Section 4.15 of the CEMP. All known rare plant occurrences are stored in the Site C Environmental Features Database and displayed on the Environmental Features Map (see Section 7.1.3). Contractors are required to avoid impacting rare plant occurrences, where feasible. Where complete avoidance is not feasible, contractors are required to employ measures to reduce adverse effects, such as by timing construction activities in winter months and frozen ground conditions, placing ramps or mats over occurrences to reduce soil compaction, using rubber-tired equipment, and implementing designated

travel routes to and from work sites. Additional mitigation for rare plant occurrences that cannot be avoided is addressed through the Experimental Rare Plant Translocation program, in which rare plant propagules are collected, propagated, out-planted and monitored (see Sections 7.1.6, 7.4.1 and 7.4.2).

### **7.1.5 Protect Tufa Seeps, Wetlands and Rare Plants Located Adjacent to Construction Areas**

This section summarizes actions taken in accordance with the following requirement of Condition 9: *Protect known occurrences of Tufa seeps, wetlands and rare plants located adjacent to construction areas. Install signage and flagging where necessary, as determined by the QEP, to indicate the boundaries of the exclusion area.*

Mitigation to minimize impacts to wetlands and rare plants adjacent to construction areas is described in the CEMP, and further described in detail in Sections 6.3.1 and 6.3.3 of this report for tufa seeps and wetlands, and Section 7.1.4 for rare plants.

Tufa seeps are present on the south bank of the eastern reservoir, where clearing occurred in 2019. Mitigation to minimize impacts on the tufa seep consisted of no ground equipment within the feature, and trees were directionally felled away from the tufa seep to the degree feasible. Further details on tufa seep mitigation measures were described in the 2022 VWMMP Annual Report. No additional tufa seeps were affected by construction activities in 2025.

### **7.1.6 Experimental Rare Plant Translocation Program**

This section summarizes actions taken in accordance with the following requirement of Condition 9: *The EAC Holder will engage the services of a Rare Plant Botanist during construction to design and implement an experimental rare plant translocation program in consultation with MOE using the BC MOE's Guidelines for Translocation of Plant Species at Risk in BC (Maslovat, 2009).*

The Experimental Rare Plant Translocation program was developed in consultation with MOECCS, MLWRS and CWS through the VWTC, and is described in detail in Section 7.4.1. Collection of seeds began in 2017. Work to collect seeds and salvage rare plants under this program continued in 2024, along with translocation and monitoring. The report detailing the results of the 2025 field program is Appendix 14.

## **7.2 EAC Condition 11**

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 11.

For context, the complete requirements of Condition 11 are shown below.

### **EAC Condition 11**

EAC Holder must compensate for the loss of rare and sensitive habitats and protect occurrences of rare plants by developing, or funding the development and implementation of a compensation program, during construction, that includes:

- Assistance (financial or in-kind) to the managing organization of suitable habitat enhancement projects in the RAA (RAA as defined in the amended EIS).
- Direct purchase of lands in the RAA and manage these lands and suitable existing properties owned by the EAC Holder to enhance or retain rare plant values where opportunities exist.

The EAC Holder must engage with MFLNRO, MOE and Aboriginal Groups with regard to the development of the compensation program.

### **7.2.1 Habitat Enhancement Projects in the Regional Assessment Area (RAA)**

This section summarizes actions taken in accordance with the following requirement of Condition 11: *EAC Holder must compensate for the loss of rare and sensitive habitats and protect occurrences of rare plants by developing, or funding the development and implementation of a compensation program, during construction, that includes assistance (financial or in-kind) to the managing organization of suitable habitat enhancement projects in the RAA (RAA as defined in the amended EIS).*

Habitat enhancement activities to compensate for the loss of rare and sensitive habitats and for protecting occurrences of rare plants are being conducted through DUC for wetland compensation activities (Section 6.3.2), and Ecologic Consultants through the Saulteau-EBA Environmental Services Joint Venture for the Experimental Rare Plant Translocation Program (Section 7.1.6).

### **7.2.2 Direct Purchase of Lands in the RAA to Enhance or Retain Rare Plant Values**

This section summarizes actions taken in accordance with the following requirement of Condition 11: *EAC Holder must compensate for the loss of rare and sensitive habitats and protect occurrences of rare plants by developing, or funding the development and implementation of a compensation program, during construction, that includes direct purchase of lands in the RAA and manage these lands and suitable existing properties owned by the EAC Holder to enhance or retain rare plant values where opportunities exist.*

In 2014 BC Hydro purchased the Marl Fen property, located outside Hudson's Hope. This property supports several rare plant species. This property is being managed to maintain rare plants along with other wildlife and vegetation values. Results of surveys documenting species that occur within the property were provided in the 2015 Annual Report of the VWWMP.

### **7.2.3 Engaging with MLWRS, MOECCS and Indigenous Groups**

This section summarizes actions taken in accordance with the following requirement of Condition 11: *The EAC Holder must engage with MFLNRO, MOE and Aboriginal Groups with regard to the development of the compensation program.*

BC Hydro continues to engage with MLWRS and MOECCS through the VWTC regarding the development of the compensation program for the loss of rare and sensitive habitats and to protect occurrences of rare plants. BC Hydro continues to engage with Indigenous Groups through ongoing communications, such as direct requests for assistance in identifying appropriate wetland compensation opportunities. In addition, BC Hydro engages with Indigenous Groups through regularly scheduled permitting and environmental forums. Those forums cover subjects that included rare plants, plants of traditional importance, wetlands, and expected Site C construction impacts on beavers.

## **7.3 EAC Condition 12**

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 12.

Details regarding the Wetland Mitigation and Compensation Plan and wetland mapping are described in Section 7.3.1 and 7.3v.1.1, respectively. Additional details regarding maintaining hydrological balance at wetlands, sedimentation barriers, stormwater management, implementation of approved work practices as per the suggestions of the provincial Develop with Care guidelines (BC MFLNRO and BC MOE 2014) were presented in Section 7.3 of the 2017 VWWMP Annual Report.

For context, the requirements of Condition 12 are shown below.

<b>EAC Condition 12</b>
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The EAC Holder must develop a Wetland Mitigation and Compensation Plan. The Wetland Mitigation and Compensation Plan must include an assessment of wetland function lost as a result of the Project that is important to migratory birds and species at risk (wildlife and plants). The Wetland Mitigation and Compensation Plan must be developed by a QEP with experience in wetland enhancement, maintenance and development.

The Wetland Mitigation and Compensation Plan must include at least the following:

- Information on location, size and type of wetlands affected by the Project;
- If roads cannot avoid wetlands, culverts will be installed under access roads to maintain hydrological balance, and sedimentation barriers will be installed;
- Stormwater management will be designed to control runoff and direct it away from work areas where excavation, spoil placement, and staging activities occur.

Develop, with the assistance of a hydrologist, site-specific measures prior to construction to reduce changes to the existing hydrologic balance and wetland function during construction of the Jackfish Lake Road and Project access roads and transmission line.

- All activities that involve potentially harmful or toxic substances, such as oil, fuel, antifreeze, and concrete, must follow approved work practices and consider the provincial BMP guidebook *Develop with Care* (BC Ministry of Environment 2012 or as amended from time to time).
- A defined mitigation hierarchy that prioritizes mitigation actions to be undertaken, including but not limited to:
  - Avoid direct effects where feasible;
  - Minimize direct effects where avoidance is not feasible;
  - Maintain or improve hydrology where avoidance is not feasible;
  - Replace like for like where wetlands will be lost, in terms of functions and compensation in terms of area;
  - Improve the function of existing wetland habitats; and
  - Create new wetland habitat

The EAC Holder must monitor construction and operation activities that could cause changes in wetland functions.

The EAC Holder must provide this draft Wetland Mitigation and Compensation Plan to Environment Canada, MFLNRO, MOE, Aboriginal Groups, Peace River Regional District and District of Hudson's Hope for review a minimum of 90 days prior to any activity affecting the wetlands.

The EAC Holder must file the final Wetland Mitigation and Compensation Plan with EAO, Environment Canada, MFLNRO, MOE, Peace River Regional District, District of Hudson's Hope and Aboriginal Groups, a minimum of 30 days prior to any activity affecting the wetlands.

The EAC Holder must develop, implement and adhere to the final Wetland Mitigation and Compensation Plan, and any amendments, to the satisfaction of EAO.

### **7.3.1 Wetland Mitigation and Compensation Plan**

Condition 12 requires: *The EAC Holder must develop a Wetland Mitigation and Compensation Plan. The Wetland Mitigation and Compensation Plan must include an assessment of wetland function lost as a result of the Project that is important to migratory birds and species at risk (wildlife and plants). The Wetland Mitigation and Compensation Plan must be developed by a QEP with experience in wetland enhancement, maintenance and development.*

Please see Section 6.3 for a description of the components of the Wetland Mitigation and

#### Compensation Plan:

- Section 6.3.1, 6.3.3 and 6.3.5 describe mitigation to avoid or minimize impacts to wetlands to the degree feasible.
- Section 6.3.2 describes the status of wetland compensation plan development, the wetland monitoring program and the Wetland Function Assessment Tool, which combined represent the measurement and compensation of wetland impacts.

#### **7.3.1.1 Information on Location, Size and Type of Wetlands Affected by the Project**

This section summarizes actions taken in accordance with the following requirement of Condition 12: *Information on location, size and type of wetlands affected by the Project.*

Three spatial datasets are available that describe the location, size and type of wetlands that may be affected by the Project: TEM habitat mapping; detailed wetland mapping; and a dataset produced by Maple Leaf Forestry. The TEM was generated in and around the Project Activity Zone (PAZ) to encompass the Peace River, the transmission line, and other sites within the PAZ. Polygons in the TEM were produced at a 1:20,000 scale, delineated using aerial photography, characterized with aerial photography combined with Vegetation Resources Inventory (VRI) forest cover mapping, and ground-truthed using field sampling. The TEM was used to generate estimates of wetland area to be affected by construction in the PAZ in the EIS and is being updated based on the results of wetland monitoring.

Detailed wetland mapping was created by BC Hydro to be finer scale wetland mapping than the TEM data. Within a TEM polygon, wetland boundaries were delineated using aerial photos that were either at a 1:5,000 or 1:15,000 scale. This allowed for greater detail to delineate the wetland edge. The detailed wetland mapping was completed along the transmission line corridor and the Peace River. It was delineated by first identifying all TEM polygons classified as wetland habitat. Using large scale aerial photographs, the boundaries of any wetland that fell within a TEM wetland polygon were then delineated and the habitat type of the TEM wetland polygon was assigned to the newly delineated wetland(s). In some cases, the TEM wetland was divided up into several smaller wetlands while in others the edge of the TEM wetland was only modified based on the higher detail aerial photographs used. Also, in some cases, wetlands have been delineated outside of TEM wetland polygons. A Field-Truthing-Required (FTR) label was assigned to any wetland where wetland classification needed refining. Because the detailed wetland mapping polygons follow wetland edge, this GIS dataset is useful for characterizing wetlands that may be affected.

In October 2017, Maple Leaf Forestry Ltd. conducted an assessment and classification of wetlands impacted by the transmission line RoW. This consisted of field visits to identify all the wetlands in the RoW, categorize them into a wetland type, and delineate the boundaries of the wetland. Wetlands were categorized into the same wetland types as in the TEM while also classified into a Wetland Riparian Class of the Forest Practices and Planning Regulation (FPPR) under the Forest and Range Practices Act (FRPA). All wetlands in the transmission line were classified as W1, W3, W5, or a non-classified wetland. The Wetland Riparian Class was used to identify the minimum riparian management area width, riparian reserve zone width and riparian management zone width for the wetland. Because the Maple Leaf Forestry dataset has field-verified wetland edges and type, there is a greater level of accuracy associated with this dataset; however, wetland mapping and characterization was only conducted along the transmission line RoW, and therefore its usefulness for characterizing wetlands that may be affected by the Project is limited.

Although each dataset has its limitations, the TEM, detailed and Maple Leaf wetland habitat mapping can be used in association with each other. Additional wetland delineation is also being conducted through the ongoing wetland monitoring program (Section 6.3.2).

With reservoir fill and corresponding construction activities completed by December 2024, mapping of impacted wetlands was re-assessed incorporating the previous methods described above which provided a more reliable amount as it was also based on ground-truthed clearing maps and as-completed closure reports outlining wetland features as various activities finished throughout the construction site.

In 2025, BC Hydro and DUC re-assessed the amount of wetland habitat affected by the Project in terms of area and functions and applied the WFA to determine the amount of wetland habitat impacted with the amount offset by the wetland rebuilds and creation. This provided an assessment of the extent of compliance with the remaining conditions of FDS Condition 11 and EAC 12. Details on the WFA and assessment methodology are provided in the Site C Wetland Mitigation and Compensation Plan found in Appendix 11.

The WFA determined that there was an overall net gain in wetland functions resulting from the creation, rebuilding, and restoration of wetland habitats which has also resulted in no net loss of wetland area. The wetland compensation projects completed to date, along with the wetland creation work currently occurring in Area A, will achieve an overall net positive outcome in both area and function.

On July 10, 2025, this information was presented in a Memo to IAAC, ECCC, and the BC EAO to demonstrate compliance with the conditions and to propose closing out the program. The Memo outlining this assessment including the calculations that DUC used determine it, are provided in Appendix 12.

### **7.3.1.1 Accounting Framework**

FDS approval conditions 11.3 and 11.4 and EAC Condition 12 describe wetland compensation targets of no net loss of wetland function or area. No other federal or provincial conditions for Site C describe defined targets for compensation, but it is nonetheless important that compensation actions be tracked.

The Accounting Framework is intended to describe the approach for tracking biological losses and gains directly associated with Site C as appropriate for each relevant approval condition and/or Schedule A Program Area, with the understanding that losses and gains will accrue over several years, and therefore it may be some time before accounting could be completed. Although it was to be used for tracking compensation actions, the Accounting Framework was not initially a regulatory requirement (i.e., not explicitly required by any provincial or federal Project approval condition, nor explicitly required under Schedule A of Site C's conditional water licences). Moreover, the Accounting Framework was not intended to set an expectation of no net loss objectives for any mitigation program or collection or programs with the exception of wetland compensation, for which the objective of no net loss was required under EAC Condition 12 and FDS Conditions 11.3 and 11.4.4. However, on July 13, 2018, the Accounting Framework was added by the BC Comptroller of Water Rights (BC MFLNRORD 2018). The Accounting Framework was updated in 2025 to provide information on how the draft 2023 Accounting Framework has since been implemented. This update can be found in Appendix 19.

## **7.4 EAC Condition 14**

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 14.

For context, the complete requirements of Condition 14 are shown below.

<b>EAC Condition 14</b>
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The EAC Holder must develop a Vegetation and Ecological Communities Monitoring and Follow-up Program for the construction phase and first 10 years of the operations phase. The Vegetation and Ecological Communities Monitoring and Follow-up Program must be developed by a QEP.

The Vegetation and Ecological Communities Monitoring and Follow-up Program must include at least the following:

- Definition of the study design for the rare plant translocation program (see condition 9).
- Plan for following-up monitoring of any translocation sites to assess the survival and health of translocated rare plant species, under the supervision of a Rare Plant Botanist.
- Measurement criteria, including vegetation growth, persistence of rare plants and establishment / spread of invasive plant species, and associated monitoring to document the effectiveness of habitat enhancement and possible compensation programs.

The Vegetation and Ecological Communities Monitoring and Follow-up Program reporting must occur annually during construction and the first 10 years of operations, beginning 180 days following commencement of construction.

#### **7.4.1 Definition of the Study Design for the Experimental Rare Plant Translocation Program**

As outlined in the VWMPP, the study design for the Experimental Rare Plant Translocation program will follow a five-step approach, as outlined in Maslovat (2009)<sup>8</sup>. The goals of the experimental rare plant translocation program are to contribute to the following:

- the viability of target rare plant species through propagule collection, propagation and translocation; and
- the field of plant translocation based on the findings from the seeding, propagation, translocation, management, and monitoring measures.

The primary objective of the ERPT is to establish new populations or augment extant populations of target rare plant species using established and, where necessary, experimental techniques.

The ERPT program also has the following secondary objectives:

- support the conservation of the target species by promoting a self-sustaining population;
- maintain local genetic diversity of target species;
- re-establish individuals of target species in high-risk areas into secure, analogous habitat; and
- produce a secondary supply of viable plant stock in the case that supplementing translocated populations is required.

There are four strategies that will be employed in achieving the goals and objectives of the program:

1. Translocate rare plant species through plant salvage, collection of vegetative propagules, and/or seeds from populations that will or may be lost (e.g., lost due to clearing activities or creation of the reservoir).
2. Document the survival of the translocated rare plants through population monitoring at re-location sites through the Site C construction period and up to the first 10 years of the operations phase.

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<sup>8</sup>Maslovat, C. 2009. Guidelines for translocation of plant species at risk in British Columbia. British Columbia Ministry of Environment, Victoria, BC.

3. Manage translocated populations as needed depending on the results of monitoring.
4. Improve the theory and practice of rare plant translocation and increase knowledge of the biology and ecology of targeted rare plant species.

The results of the study will be made publicly available as part of the annual Vegetation and Wildlife Mitigation and Monitoring Program report so that learnings are accessible to others, thereby adding to the relevant knowledge base and improving the theory/practice of rare plant translocation. Details of the Experimental Rare Plant Translocation program activities in 2025 is provided in Appendix 14.

The program at its current state of development consists of four main phases over 10 years of study (2016 to 2025):

- 1. Literature Review and Program Development (2016-2025).** The literature review and program development is underway and will continue throughout the duration of the ERPT program. A review of existing guidance, methodologies, and results of previous rare plant translocation projects worldwide is ongoing. The lessons learned through these studies and analyses are being used to inform the structure and methods of the ERPT program.
- 2. Propagule Collection (2017 to 2025).** The standards for collecting and storing propagules for *ex situ* conservation (e.g., timing, sampling, labelling, cleaning, processing, stratification, sowing, and provenance) incorporate guidance outlined in Maslovat (2009) and by the European Native Seed Conservation Network (ENSCONET; 2009)<sup>9</sup>. The program is designed to collect seeds and cuttings or whole plants and to characterize the site conditions at the source locations. The level of risk to each plant population is being used to prioritize sites for the collection program and will be used for future collection activities, as appropriate. The level of risk is determined based on the expected clearing date, rarity of the plant, and predicted propagule collection timing.  
  
Propagule collection is occurring throughout the growing season and takes into consideration local plant phenology and propagation. Field teams are conducting multiple site visits to collect seeds on several occasions as appropriate based on seed availability and readiness.
- 3. Ex-situ Propagation (2017 to 2025).** This phase of the ERPT Program involves the evaluation of methods and implementation of seed cleaning, drying, storage, stratification, and ex-situ propagation for each individual taxon. Depending on the species and seed type, seeds are either being dried or cleaned following collection to ensure maximum viability. Cleaning includes the removal of waste material from the seed itself and involves the use of sieves, hand separation, and water baths and drying, as appropriate. Stratification is conducted as needed, whereby seeds are treated with cold or moist heat to simulate natural germination conditions. Stratification is the term for the series of controlled external conditions a seed is exposed to break dormancy and is designed to emulate the environmental conditions that a seed would be exposed to in nature. Many (but not all) seeds require stratification to break seed dormancy and permit germination. Some seeds also require a pre-treatment, such as mechanical or acid scarification, to weaken the seed coat prior to stratification. Seeds that do not require stratification are stored until spring. Propagation methods for asexual and sexual propagation for each species are being investigated in the context of the ecological conditions observed at the source populations.
- 4. Translocation Implementation (2018 to 2025).** The detailed methods for translocation implementation are being refined based on data collected during field activities. Translocation

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<sup>9</sup>ENSCONET. 2009. Seed Collecting Manual for Wild Species. Main editors: Royal Botanic Gardens (UK) & Universidad Politécnica de Madrid (Spain). Edition 1: 17 March 2009.

implementation involves site selection, site preparation and seeding and/or planting at recipient sites. Efforts will be made to determine if any site preparation (for intact habitats) or site engineering (for restoration sites) is required before translocation and to identify if habitat manipulation after the translocation will be required. Recipient sites will be prepared as necessary prior to the translocation, including invasive plant species removal (and implementation of steps to minimize introduction during the translocation process), soil amendment, and sculpting microcatchments. Specific planting techniques for founder plants (i.e., those plants initially transplanted at a recipient site) are being developed for each species. The specific timing windows for planting will be determined based on the plant phenology, the development stage of the propagated plants, and the local weather and soil moisture conditions. Initial translocation occurred in September 2018. Additional planting was completed annually from 2019 through 2024. Planting efforts are incorporating the key findings from previous planting efforts. Some stock is being withheld from planting as insurance should inclement conditions negatively affect the initial out-planting stock.

- 5. Post-translocation Care, Maintenance and Monitoring (2018 to 2035).** Post-translocation care, maintenance, and monitoring commences immediately after each translocation event is completed. Post-translocation plant care and site management assesses the survival of translocated populations and addresses factors affecting the survival or health of the translocated plants. The first two to three years of follow-up site visits and data collection (i.e., short-term monitoring) will inform the frequency and level of effort required for post-translocation care and additional monitoring in subsequent years (i.e., long-term monitoring). Translocated populations that are achieving identified targets will still require long-term monitoring but may require less frequent follow-up visits than populations that are not achieving key metrics and require more active management. Monitoring the success or failure of the methods will assist in identifying opportunities for improvement within an adaptive management framework. This information can also help to inform other translocation projects, thereby improving the overall success of rare plant translocation as a tool for biodiversity conservation.

#### **7.4.2 Plan for Monitoring Translocations**

Experimental Rare Plant Translocation Program monitoring will document a suite of parameters designed to evaluate the efficacy of translocation methods in relation to the stated objectives of the program. All actions associated with the translocation (see Section 7.5.1) will be fully documented to retain as much information as possible on the pathway of a given plant (e.g., from seed collection to planting) to facilitate post-hoc assessments of success. Specifically, the monitoring program will measure, document, and evaluate the following:

1. the efficacy of the methods used to a) characterize donor and recipient sites, b) collect and store plant propagules, c) conduct ex-situ propagation; and d) translocate the rare plant species from the host site to the recipient sites;
2. the efficacy of the techniques used for managing the translocated plant propagules (e.g. site preparation, watering, weeding, fertilizing);
3. the survival of the translocated rare plant species through monitoring of population size, extent, threats, resilience, and persistence; and
4. the success of follow up procedures applied to address any declines in survival or fitness of the translocated plants.

### 7.4.3 Measurement Criteria for Effectiveness Monitoring of Habitat Enhancement and Compensation Programs

Please see Section 7.5.2 for how the effectiveness of the rare plant translocation program will be measured.

### 7.5 EAC Condition 15

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 15.

For context, the complete requirements of Condition 15 are shown below.

#### **EAC Condition 15**

The EAC Holder must develop a Wildlife Management Plan. The Wildlife Management Plan must be developed by a QEP.

The Wildlife Management Plan must include at least the following:

- Field work, conducted by a QEP, to verify the modelled results for surveyed species at risk and determine, with specificity and by ecosystem, the habitat lost or fragmented for those species. The EAC Holder must use these resulting data to inform final Project design and to develop additional mitigation measures, as needed, as part of the Wildlife Management Plan, in consultation with Environment Canada and MFLNRO.
- Measures to avoid, if feasible, constructing in sensitive wildlife habitats. If avoiding sensitive wildlife habitats is not feasible, condition 16 applies.
- If sensitive habitats, such as wetlands, are located immediately adjacent to any work site, buffer zones must be established by a QEP to avoid direct disturbance to these sites.
- Protocol for the application of construction methods, equipment, material and timing of activities to mitigate adverse effects to wildlife and wildlife habitat.
- Protocol to ensure that lighting is focused on work sites and away from surrounding areas to manage light pollution and disturbance to wildlife. If lighting cannot be directed away from surrounding areas, the EAC Holder must ensure additional mitigation measures are implemented to reduce light pollution, including light shielding.
- A mandatory environmental training program for all workers so that they are informed that hunting in the vicinity of any work site/Project housing site is strictly prohibited for all workers.

The EAC Holder must ensure that all workers are familiar with the Wildlife Management Plan.

The EAC Holder must submit this draft Wildlife Management Plan to Environment Canada, MFLNRO, MOE and Aboriginal Groups for review a minimum of 90 days prior to the commencement of construction.

The EAC Holder must file the final Wildlife Management Plan with EAO, Environment Canada, FLN, MOE and Aboriginal Groups, a minimum of 30 days prior to commencement of construction.

The EAC Holder must develop, implement and adhere to the final Wildlife Management Plan, and any amendments, to the satisfaction of EAO.

#### **7.5.1 Measures to Avoid, if Feasible Constructing in Sensitive Wildlife Habitats**

This section summarizes actions taken in accordance with the following requirement of Condition 15: *Measures to avoid, if feasible, constructing in sensitive wildlife habitats. If avoiding sensitive wildlife habitats is not feasible, condition 16 applies.*

Measures to avoid impacts to sensitive wildlife habitats are described in Section 4.17 of Revision 5 of the CEMP:

- Avoid construction activity within Important Wildlife Areas, including designated setback buffers determined by a QEP, where feasible. Important Wildlife Areas are defined in the CEMP as habitat areas that animals use around the same time each year, such as the following:
  - wetlands;
  - snake hibernacula;
  - bat hibernacula;
  - sharp-tailed grouse leks;
  - beaver lodges, dams and food caches;
  - active furbearer and large carnivore den sites;
  - active bird nests;
  - mineral licks;
  - habitat used by ungulates for winter range; and
  - amphibian breeding sites and migration routes.
- Except within the dam site area, on designated access roads and during clearing, construction activities are prohibited within 15 m of the Ordinary High Water Mark of streams or wetlands, unless the activity was described in the EIS and is accepted by BC Hydro (CEMP Section 4.5);
- Guidance to minimize impacts to raptor nests;
- Protocol for conducting sharp-tailed grouse lek monitoring and a decision tree for various lek activity scenarios to minimize impacts to sharp-tailed grouse leks (see also Appendix 7 of the 2016 Annual Report); and
- Measures for minimizing impacts to amphibian breeding and migration areas (see also Section 6.4.1.2).

### **7.5.2 Setback Buffers to Avoid Direct Impacts to Sensitive Habitats**

This section summarizes actions taken in accordance with the following requirement of Condition 15: *If sensitive habitats, such as wetlands, are located immediately adjacent to any work site, buffer zones must be established by a QEP to avoid direct disturbance to these sites*

As specified above in Section 7.6.1, Revision 5 of the CEMP (Section 4.17), construction activity is to be avoided within Important Wildlife Areas, including in designated setback buffers as determined by a QEP, where feasible. Wetland avoidance measures are discussed further in Section 6.3.1.

Procedures for determining appropriate situation- and species-specific disturbance setback buffers to be applied around locations where bird nests are present are discussed in Section 6.1.1 (migratory birds).

### **7.5.3 Mitigation of Adverse Effects to Wildlife and Wildlife Habitat**

This section summarizes actions taken in accordance with the following requirement of Condition 15: *Protocol for the application of construction methods, equipment, material and timing of activities to mitigate adverse effects to wildlife and wildlife habitat.*

Mitigation of adverse effects to wildlife is discussed in Sections 7.6.1 and 7.6.2. Section 6.4.1.2 provides a summary of mitigation applied to minimize adverse impacts to amphibians. Revisions 5 and 6 of the CEMP (Section 4.17) specify that, where feasible, vegetation clearing will take place during Peace Region terrestrial wildlife least-risk windows. Least risk timing windows for wildlife are described in Table 5 of the CEMP.

Where clearing outside of least-risk timing windows cannot be avoided, pre-clearing surveys are

required, with disturbance setback buffers determined by a QEP.

#### **7.5.4 Protocol to Ensure that Lighting is Focused on Work Sites**

This section summarizes actions taken in accordance with the following requirement of Condition 15: *Protocol to ensure that lighting is focused on work sites and away from surrounding areas to manage light pollution and disturbance to wildlife. If lighting cannot be directed away from surrounding areas, the EAC Holder must ensure additional mitigation measures are implemented to reduce light pollution, including light shielding.*

Section 4.17 of the CEMP requires contractors to focus lighting on work sites and away from surrounding areas to minimize light. CEMP requirements are audited by site Environmental Monitors and the Independent Environmental Monitor to determine and enforce compliance.

#### **7.5.5 Environmental Training of Workers**

This section summarizes actions taken in accordance with the following requirement of Condition 15: *A mandatory environmental training program for all workers so that they are informed that hunting in the vicinity of any work site/Project housing site is strictly prohibited for all workers. The EAC Holder must ensure that all workers are familiar with the Wildlife Management Plan.*

All workers are required to attend both a BC Hydro orientation and a contractor specific orientation prior to starting work on-site. A component of these training sessions is environmental training for workers. Completion of these sessions is required prior to the issuance of site access cards for BC Hydro employees and contractors.

#### **7.6 EAC Condition 16**

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 16.

For context, the complete requirements of Condition 16 are shown below.

##### **EAC Condition 16**

If loss of sensitive wildlife habitat or important wildlife areas cannot be avoided through Project design or otherwise mitigated, the EAC Holder must implement the following measures, which must be described in the Vegetation and Wildlife Mitigation and Monitoring Plan.

The Vegetation and Wildlife Mitigation and Monitoring Plan must include the following compensation measures:

- Compensation options for wetlands must include fish-free areas to manage the effects of fish predation on invertebrate and amphibian eggs and larvae and young birds.
- Mitigation for the loss of snake hibernacula, artificial dens must be included during habitat compensation.
- Management of EAC Holder-owned lands adjacent to the Peace River suitable as breeding habitat for Northern Harrier and Short-eared Owl.
- Establishment of nest boxes for cavity-nesting waterfowl developed as part of wetland mitigation and compensation plan, and established within riparian vegetation zones established along the reservoir on BC Hydro-owned properties.
- A design for bat roosting habitat in Hwy 29 bridges to BC Ministry of Transportation and Infrastructure (MOTI) for consideration into new bridge designs located within the Peace River valley.
- Following rock extraction at Portage Mountain, creation of hibernating and roosting sites for bats.
- Creation of natural or artificial piles of coarse woody debris dispersed throughout the disturbed landscape to maintain foraging areas and cold-weather rest sites, and arboreal resting sites, for the fisher population south of the Peace River.

The EAC Holder must provide this draft Vegetation and Wildlife Mitigation and Monitoring Plan to Environment Canada, MFLNRO, MOE, and Aboriginal Groups for review a minimum of 90 days prior to the commencement of construction.

The EAC Holder must file the final Vegetation and Wildlife Mitigation and Monitoring Plan with EAO, Environment Canada, MFLNRO MOE, and Aboriginal Groups, a minimum of 30 days prior to commencement of construction.

The EAC Holder must develop, implement and adhere to the final Vegetation and Wildlife Mitigation and Monitoring Plan, and any amendments, to the satisfaction of EAO.

### **7.6.1 Wetland Compensation that Includes Fish-Free Areas**

As of the end of 2025, BC Hydro had acquired one property for wetland compensation (i.e., the Marl Fen property) and has constructed or saved from imminent loss 269.5 ha across five wetlands that are all fish-free. In total, the wetland compensation opportunities that have been constructed or identified for Site C currently total an estimated 304 ha of wetland based on the past wetland projects and the 34.4 ha of wetlands that have been completed to date in Area A. Once Area A is completed by the end of 2026, an additional 3.7 ha will be created resulting in a final compensation total of 307.6 ha (see Wetland Mitigation and Compensation Plan in Appendix 11).

### **7.6.2 Mitigation for the Loss of Snake Hibernacula**

Six artificial hibernacula for gartersnake overwintering were constructed in 2020 on the north side of the Peace River. In 2023, one additional snake den was constructed near Cache Creek. Occupancy monitoring of the first six artificial snake hibernacula occurred from 2021 to 2023. Two were considered to be occupied in 2022: Snake Den 21.4 (Dam View), and Snake Den48 (Wilder Creek) and a shed snakeskin was found beneath a patio stone within 10 m of the entrance to Snake Den 21.4. However, no signs of snake use of the den sites were observed in 2023. The Cache Creek snake den was monitored for snake activity in September 2024 and in 2025. Snakes were observed in the vicinity of the artificial hibernaculum, but it could not be determined if the den was being used for overwintering. Monitoring for snake use will continue in 2026 as per the monitoring plan stating that artificial hibernacula will be monitored for three years upon den construction completion. The report detailing monitoring of the Cache Creek snake den in 2025 is in Appendix 20.

### **7.6.3 Nest Boxes for Cavity-Nesting Waterfowl**

Thirteen different nest box designs were constructed to accommodate 21 species of cavity nesting birds, with some box designs intended to support multiple species. Between 2017 and 2022, 277 nest boxes were installed on trees and structures on BC Hydro owned and managed lands, and on private lands where permission was granted. Nest boxes were strategically placed along the reservoir shoreline in areas determined to be most beneficial to each species group, while also considering availability of land and suitable access for installation and future mitigation effectiveness monitoring.

Monitoring of nest boxes began in the breeding season of 2020 and continued in 2025. The Cavity Nesting Mitigation and Monitoring Program 2025 Annual Report is in Appendix 21.

### **7.6.4 Creation of Wildlife Trees**

Between 2022-2023, 300 wildlife trees were created or enhanced at the Site C project area by fungal inoculation and mechanical stem manipulation (e.g., tree girdling and topping) to enhance cavity-causing decay and followed up by effectiveness monitoring (medium-term strategy for primary cavity excavators). This will increase nesting, roosting, and denning habitat supply for cavity-dwelling wildlife over multiple time scales such as woodpeckers, owls, migratory passerines, kestrels, squirrels, bats, and furbearers.

The Wildlife Tree Habitat Enhancement program was completed in 2023 with the Final Report detailing the program presented in the 2023 VWMMP Annual Report. BC Hydro is providing funding for graduate student research as a follow-up to monitoring these trees to the University of Northern BC beginning in 2026.

### **7.6.5 A Design for Bat Roosting Habitat in Hwy 29 Bridges**

This section summarizes actions taken in accordance with the following requirement of Condition 16: *A design for bat roosting habitat in Hwy 29 bridges to BC Ministry of Transportation and Infrastructure (MOTI) for consideration into new bridge designs located within the Peace River valley.*

During baseline surveys bats were documented using the Farrell Creek, Halfway River and Cache Creek bridges as night roosts. These three bridges and the bridge at Lynx Creek were inundated by reservoir fill. New bridges were constructed at these locations.

BC Hydro had previously reached an agreement with MOTI to install bat roost structures on newly constructed bridges along re-aligned sections of Highway 29 to offset the losses of night roosts on existing bridges. However, on 25 October 2018, BC Hydro received notification from the Regional Manager of Environmental Services, MOTI, that MOTI no longer supported the placement of bat roosting boxes on bridges. Therefore, bat boxes were not integrated into the designs of any new bridges, including those at Farrell Creek, Halfway River, Cache Creek and Lynx Creek.

### **7.6.6 Creation of Hibernating and Roosting Sites for Bats**

This section summarizes actions taken in accordance with the following requirement of Condition 16: *Following rock extraction at Portage Mountain, creation of hibernating and roosting sites for bats.*

In February of 2016 the BC Ministry of Environment released Best Management Practices Guidelines for Bats in British Columbia “Bat BMPs”<sup>10</sup>. These guidelines recommend that a 100 m buffer be established around the core area of bat habitat, which for Portage Mountain is defined as all the suspected hibernacula entrances that had been documented. Within this 100 m, no activities that modify the above or below ground habitat are allowed. The guidelines also recommend a 1 km special management zone, within which blasting activities are permitted if the following can be achieved:

- No blasting to occur between October and May;
- Blasting must be conducted within the following parameters (to avoid damage to the rock structures associated with the hibernacula):
  - the sound concussion is less than 150 dB;
  - the shock wave is less than 15 p.s.i.; and
  - the peak particle velocity is less than 15 mm/s.

To avoid impacting the hibernacula at Portage Mountain that are being used by little brown myotis and northern myotis, BC Hydro moved the quarry to the eastern edge of the License of Occupation area prior to the commencement of construction activities. This relocation achieved a 300 m buffer around 16 documented hibernacula, where no activities or access were permitted. This mitigation is described in detail in Appendix 8 of the 2016 Annual Report.

To avoid disturbance to hibernating bats, BC Hydro has also prohibited blasting at Portage Mountain between September 15 and May 15 (see Section 4.2 of the CEMP); this window was based on data collected at the hibernacula in 2013 and in consultation with bat biologists (see the 2016 Annual Report).

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<sup>10</sup> BC MOE. 2016. Best Management Practices Guidelines for Bats in British Columbia. Chapter 2: Mine Developments and Inactive Mine Habitats. 68 pp.

For planned activities at Portage Mountain Quarry, noise modelling was conducted, from which it was determined that at 300 m:

- the sound concussion would be 120 dB (below BMP limit of 150 dB);
- the shock wave would be 0.002 p.s.i (1 kPa) and (below BMP limit of 15 p.s.i (104 kPa); and
- the peak particle velocity would be 2.84 mm/s (below BMP limit of 15 mm/s).

As described in Section 6.4.3.3, BC Hydro monitored the noise and vibration caused by activity at Portage Mountain Quarry in 2018, 2019 and 2021, and found that blasting within the re-designed quarry boundaries did not exceed the thresholds for noise and vibration defined within the BC MOE Best Management Practices Guidelines for Bats in British Columbia (i.e., air overpressure of less than 150 decibels, shock wave less than 15 p.s.i., and peak particle velocity (PPV) less than 15 mm/second; BC MOE 2016). Noise and vibration modelling were used to supplement available data to determine that also in 2020 blasting likely did not exceed the BC BMP thresholds for noise or vibration at important bat habitat. No blasting occurred at Portage Mountain in 2025. As described in Section 6.4.3.3, BC Hydro is also conducting year-round monitoring of bat use at the established Portage Mountain artificial bat hibernacula.

Through the broader Site C bat mitigation and monitoring program, BC Hydro has constructed and installed 120 bat roost boxes and one large bat house in suitable habitat near the future reservoir and dam site. Monitoring of bat activity at the bat box installation locations including 12 new ones to be installed in 2025 will occur annually through the first 10 years of operations of Site C. The report describing the results of the last bat activity monitoring at Portage Mountain over multiple years and compared to sentinel (control) sites from 2017 to 2023 was provided in Appendix 10 of the 2024 VWMMP Annual Report.

In 2023, BC Hydro constructed three artificial bat hibernacula at the Portage Mountain Quarry site by drilling holes at least 3 m deep in rock faces on warm aspects that were inaccessible to predators. Small charges were used within the drill holes to create rock fractures to provide a range of microclimatic conditions and insulation for overwintering bats. A fourth hibernaculum using a culvert design as per the recommendation of the bat SME, was completed in 2024. The report describing the design and construction details of all four artificial bat hibernacula established at Portage Mountain was provided in Appendix 11 of the 2024 VWMMP Annual Report.

### **7.6.7 Resting Sites for Fisher**

This section summarizes actions taken in accordance with the following requirement of Condition 16: *Creation of natural or artificial piles of coarse woody debris dispersed throughout the disturbed landscape to maintain foraging areas and cold-weather rest sites, and arboreal resting sites, for the fisher population south of the Peace River.*

A total of 98 coarse woody debris (CWD) piles to maintain foraging areas and cold-weather rest sites for fisher have been created within the dam site area, along the transmission line, and along the cleared edge of Ice Bridge Road towards Area E. Signs were installed at CWD piles to indicate that they were designated fisher habitat and to prevent their inadvertent disturbance by construction activities.

In addition to CWD piles, BC Hydro constructed and installed 88 fisher den boxes between 2018 and 2020 to help mitigate the loss of denning habitat due to reservoir clearing. In 2023, all 88 den boxes were monitored by visiting all den boxes to install game cameras, checking and replacing hair snaggers at the box entrances, and applying lure at the structures to help attract fishers (February – March 2023). A total of 106,946 photographs were reviewed from the 2023 reproductive season (March – July) with fishers detected at eight den boxes. However, no prolonged use or evidence of reproduction was observed in 2023. This program is now closed with details of the fisher monitoring program presented in the 2023 VWMMP Annual Report.

## 7.7 EAC Condition 19

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 19.

For context, the complete requirements of Condition 19 are shown below.

### **EAC Condition 19**

The EAC Holder must use reasonable efforts to avoid and reduce injury and mortality to amphibians and snakes on roads adjacent to wetlands and other areas where amphibians or snakes are known to migrate across roads including locations with structures designed for wildlife passage.

The EAC Holder must consult with Environment Canada, MFLNRO and MOE with regard to the size and number of the proposed structures prior to construction.

Appropriate amphibian mitigation is monitored by BC Hydro site Environmental Monitors and the Independent Environmental Monitor against commitments within EPPs to determine and enforce compliance. Amphibian mitigation activities are summarized in Section 6.4.1.2.

Work sites are being regularly monitored during the spring and summer for western toad migration and dispersal, as per the Western Toad Management Procedure. Western toad movement patterns have not yet resulted in mass movements across access roads such that specific structures designed for amphibian passage have been required. However, due to specific concerns regarding western toad mitigation at Portage Mountain Quarry during a BC Environmental Assessment Office (EAO) inspection in 2016, a suitable location for installation of an amphibian crossing structure was identified based on a habitat assessment and observations of western toad movement patterns. A 15 m long 1,000 mm diameter culvert was installed along the access road to Portage Mountain, following guidance described in *Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia. A companion document to Develop with Care* (BC MFLNRD and BC MOE 2014).

## 7.8 EAC Condition 21

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 21.

For context, the complete requirements of Condition 21 are shown below.

### **EAC Condition 21**

The EAC Holder must ensure that measures implemented to manage harmful Project effects on wildlife resources are effective by implementing monitoring measures detailed in a Vegetation and Wildlife Mitigation and Monitoring Plan. The Vegetation and Wildlife Mitigation and Monitoring Plan must be developed by a QEP.

The Vegetation and Wildlife Mitigation and Monitoring Plan must include at least the following:

- Monitor Bald Eagle nesting populations adjacent to the reservoir, including their use of artificial nest structures.
- Monitor waterfowl and shorebird populations and their use of natural wetlands, created wetlands, and artificial wetland features.
- Monitor amphibian use of migration crossing structures installed along Project roads.
- Survey songbird and ground-nesting raptor populations during construction and operations.
- Survey the distribution of western toad and garter snake populations downstream of the Site C dam to the Pine River.
- Require annual reporting during the construction phase and during the first 10 years of operations to

EAO, beginning 180 days following commencement of construction.

The EAC Holder must provide this draft Vegetation and Wildlife Mitigation and Monitoring Plan to MFLNRO, MOE, Environment Canada and Aboriginal Groups for review a minimum of 90 days prior to the commencement of construction.

The EAC Holder must file the final Vegetation and Wildlife Mitigation and Monitoring Plan must with EAO, MFLNRO, MOE, Environment Canada and Aboriginal Groups a minimum 30 days prior to the commencement of construction.

The EAC Holder must develop, implement and adhere to the final Vegetation and Wildlife Mitigation and Monitoring Plan, and any amendments, to the satisfaction of EAO.

### **7.8.1 Monitoring of Bald Eagle Nesting Populations**

Known bald eagle nest locations along the Peace River and at natural wetlands adjacent to the Site C transmission line right-of-way were surveyed by helicopter over three days in May and June 2025. Of special significance was the successful use of an artificial nest platform by a bald eagle pair resulting in a chick prior to reservoir fill. A summary of the methods and results of Bald Eagle nest aerial monitoring in 2025 is presented in Appendix 22.

### **7.8.2 Monitoring Waterfowl and Shorebird Populations**

This section summarizes actions taken in accordance with the following requirement of Condition 21: *Monitor waterfowl and shorebird populations and their use of natural wetlands, created wetlands, and artificial wetland features.*

A summary of the waterbird survey program is presented in Section 6.1.3.4 and Waterbirds Follow-up Monitoring 2025 Annual Report can be found in Appendix 4.

### **7.8.3 Monitor Amphibian Use of Migration Crossing Structures Installed along Project Roads**

This section summarizes actions taken in accordance with the following requirement of Condition 21: *Monitor amphibian use of migration crossing structures installed along Project roads.*

A 15 m long 1,000 mm diameter culvert has been installed along the access road to Portage Mountain, following guidance described in *Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia. A companion document to Develop with Care* (BC MFLNRO and BC MOE 2014). Monitoring of amphibian use of the crossing structure was conducted following the requirements of the Site C Western Toad Management Procedure. Western toad activity along the area around the access road in general has been low, and no western toad use of the crossing structure has yet been documented.

### **7.8.4 Survey Songbird and Ground-Nesting Raptor Populations During Construction and Operations**

This section summarizes actions taken in accordance with the following requirement of Condition 21: *Survey songbird and ground-nesting raptor populations during construction and operations.*

#### **7.8.4.1 Songbirds**

A summary of the songbird monitoring program is presented in Section 6.1.3.1 and the Breeding Bird Follow-up Monitoring – Songbirds 2025 Annual Report can be found in Appendix 1.

#### **7.8.4.2 Ground-nesting Raptors**

Ground nesting raptor surveys in 2025 were conducted at cleared portions of the Site C reservoir. Ground nesting raptor surveys were completed up to four times per site over May and June 2025 to

capture early, middle, and late stages of their breeding season. The ground-nesting raptor monitoring 2025 annual report can be found in Appendix 15.

### **7.8.5 Annual Reporting Beginning 180 Days Following Commencement of Construction**

This section summarizes actions taken in accordance with the following requirement of Condition 21: *Require annual reporting during the construction phase and during the first 10 years of operations to EAO, beginning 180 days following commencement of construction.*

Submission of this report satisfies the requirement this portion of Condition 21 for 2025 during the construction phase of the Site C Clean Energy Project.

### **7.9 Status of Listed Species**

This section of the annual report summarizes the programs implemented in 2025 in accordance with the requirements of Condition 23. For context, the complete requirements of Condition 23 are shown below.

#### **EAC Condition 23**

The EAC Holder must maintain current knowledge of Project effects on the status of listed species by tracking updates for species identified by the Province, the Committee on the Status of Endangered Wildlife in Canada, and the Species at Risk Act.

Should the status of a listed species change for the worse during the course of the construction of the Project due to Project activities, the EAC Holder, must work with Environment Canada MFLNRO and MOE to determine if any changes to the associated management plans or monitoring programs are required to mitigate effects of the Project on affected listed species.

#### **7.9.1 Rare Plants**

Please see Section 6.4.4.1 for a summary of ranking changes to rare plants.

#### **7.9.2 Wildlife**

Please see Section 6.4.4.2 for a summary of ranking changes to wildlife.

### **7.10 Ungulate Winter Range**

The complete requirements of Condition 24 are shown below.

#### **EAC Condition 24**

The EAC Holder must identify suitable lands for ungulate winter range by the end of the first year of construction, on BC Hydro-owned lands, or Crown lands, in the vicinity of the Project in consultation with MFLNRO. If MFLNRO determines that identified winter range is required, the EAC Holder must identify and maintain suitable BC Hydro- owned lands for ungulate winter range to the satisfaction of MFLNRO and for the length of time determined by MFLNRO.

The plan for the identification, retention and maintenance of ungulate winter range was developed through the VWTC and determined to be complete by the Comptroller of Water Resources in 2016. After reservoir filling, it is anticipated that lands identified by BC Hydro as ungulate winter range for elk and deer will total about 515 ha at commencement of operation. A summary of these lands and maps and their locations were provided in the June 5, 2015 VWMMP. These lands are on the north bank of the Peace River between the Halfway River to the west and the dam site to the east.

MLWRS was in the process of identifying appropriate lands for moose winter range as mitigation for expected Project impacts on moose habitat. BC Hydro provided \$10,000 to MLWRS (now MWLRS) to support the Indigenous consultation necessary to identify and protect appropriate moose winter range.

## 8.0 References

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BC Hydro. 2023. Vegetation and Wildlife Mitigation and Monitoring Plan 2022 Annual Report, Site C Clean Energy Project, 30 March 2023. Available at: <https://www.sitecproject.com/sites/default/files/Vegetation-and-Wildlife-Mitigation-and-Monitoring-Plan-2022-Annual-Report-Part-1.pdf>.

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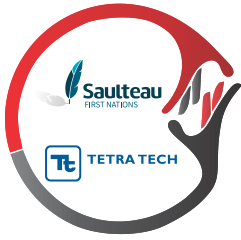
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## **Appendix 1. 2025 Songbird Annual Report**



# Site C Clean Energy Project Breeding Bird Follow-up Monitoring - Songbirds 2025 Annual Report



PRESENTED TO  
**British Columbia Hydro and Power Authority**

MARCH 24, 2026  
ISSUED FOR USE  
FILE: 704-ENW.BIOS03193-01.SONG25

Saulteau EBA Environmental Services Joint Venture  
Suite 1000 – 10th Floor, 885 Dunsmuir Street  
Vancouver, BC V6C 1N5 CANADA  
Tel 604.685.0275 Fax 604.684.6241

## Site C Clean Energy Project Breeding Bird Follow-up Monitoring - Songbirds 2025 Annual Report

FILE: 704-ENW.BIOS03193-01.SONG25  
March 24, 2026

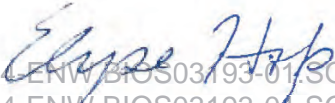
### PRESENTED TO

Site C Clean Energy Project  
BC Hydro and Power Authority  
P.O. Box 49260  
Vancouver, BC V7X 1V5


### PRESENTED BY

Saulteau EBA Environmental Services  
Joint Venture  
1000-885 Dunsmuir Street  
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Prepared by:

  
FILE: 704-ENW.BIOS03193-01.SONG25  
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Reviewed by:

  
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### LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of British Columbia Hydro and Power Authority and their agents. Saulteau EBA Environmental Services Joint Venture (SEES JV) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than British Columbia Hydro and Power Authority, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix D or Contractual Terms and Conditions executed by both parties.

## EXECUTIVE SUMMARY

Saulteau EBA Environmental Services Joint Venture (SEES JV) completed breeding bird point count surveys in the area of British Columbia Hydro and Power Authority's (BC Hydro) Site C Clean Energy Project ("Site C", the Project) in spring and summer 2025. The surveys were part of BC Hydro's Breeding Bird Follow-up Monitoring Program for songbirds<sup>1</sup>. Songbirds are passerines, hummingbirds, swifts, doves, kingfisher, and pigeons (i.e., all members of the orders *Passeriformes*, *Apodiformes*, *Columbiformes*, and *Coraciiformes*). Songbird baseline surveys were conducted in 2006, 2008, 2011 and 2012. Surveys were again conducted in 2016 through 2025 as part of the follow-up monitoring program. This report describes the methods used to conduct the 2025 surveys and a summary of the results. Information from earlier monitoring years is also summarized to place the 2025 results in a broader temporal context and to describe the development of the long-term dataset spanning baseline, construction, and operations.

Surveys were conducted June 3-25, 2025 at 102 stations in the Peace River Valley and around the Project footprint. Each station was surveyed two times to maximize the detection of early and late breeders. Birds were surveyed using unlimited-radius point counts.

A total of 87 bird species were detected, of which 68 were songbirds. Five songbird species listed under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the *Species at Risk Act* (SARA) and/or British Columbia's Red and Blue lists were observed during the surveys. The median number of songbird species detected per point count survey was 9 (range 1 to 18).

Surveys conducted in 2025 represent a continuation in monitoring of semi-permanent monitoring stations that will be monitored through to 10 years post-construction.

Since monitoring began in 2006, a total of 111 songbird species have been detected during breeding season surveys, including 15 species considered at risk in British Columbia or Canada. Data collected between 2017 and 2025 were summarized to provide a preliminary assessment of patterns in species richness and total detections. These results provide a high-level overview of developing long-term patterns, while more detailed analyses incorporating the full baseline through operations dataset will be completed in future reporting.

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<sup>1</sup> Woodpecker and Common Nighthawk surveys are also included under BC Hydro's Breeding Bird Follow-up Monitoring Program.

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- Appendix B Project Qualified Environmental Professionals
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- Appendix D SEES JV's Limitations on the Use of This Document

## 1.0 INTRODUCTION

Saulteau EBA Environmental Services Joint Venture (SEES JV) completed breeding bird point count surveys in the area of British Columbia Hydro and Power Authority's (BC Hydro) Site C Clean Energy Project ("Site C," the Project) in spring and summer 2025. The surveys were part of BC Hydro's Breeding Bird Follow-up Monitoring Program for Songbirds<sup>2</sup>. Songbirds are passerines, hummingbirds, swifts, doves, kingfisher, and pigeons (i.e., all members of the orders *Passeriformes*, *Apodiformes*, *Columbiformes*, and *Coraciiformes*). Songbird baseline surveys were conducted in 2006, 2008, 2011 and 2012. Surveys were again conducted annually between 2016 and 2025 as part of the follow-up monitoring program.

The objectives of the Breeding Bird Follow-up Monitoring Program for songbirds are to:

1. Determine the distribution and abundance of songbirds within habitat lost or otherwise affected by the Project to verify the predictions made in the Environmental Impact Statement (EIS; Hilton et al. 2013).
2. Identify species-habitat relationships to help identify areas for offsetting impacts.
3. Conduct effectiveness monitoring to determine the degree to which mitigation areas offset impacts to songbirds and their habitat and determine further songbird mitigation requirements.
4. Determine changes to the songbird community in the Peace River valley (to 10 years post-construction).

The annual report prepared in 2019 (SEES JV 2020a) provided an analysis of the data collected 2006-2019 in support of objectives 1 and 2. To address objective 3, the mitigation areas (currently the Marl Fen, Rutledge, and Wilder Creek properties) were surveyed in 2016 and 2017 (SEES JV 2017; SEES JV 2018). Surveys of the mitigation properties were to be conducted again when the reservoir had been inundated or following substantial land use changes or habitat modifications in the mitigation properties, whichever occur first. Filling of the Site C reservoir began on August 25, 2024 and was completed 11 weeks later on November 7, 2024. In June 2025 (i.e., the first survey period after inundation), songbird surveys within the mitigation areas continued. The point count data obtained from surveys in 2025 were primarily in support of objectives 3 and 4 and will form part of the long-term monitoring data to assess changes in the songbird community over time (baseline to 10 years post-construction).

This report presents the results of breeding songbird monitoring conducted in 2025 and provides an overview of breeding songbird survey data collected to date. Information from earlier monitoring years is summarized to place the 2025 results in a broader temporal context and to describe the development of the long-term dataset spanning baseline, construction, and operations. Together, these data support ongoing evaluation of songbird community conditions and provide the foundation for future analyses of trends over time.

## 2.0 REGULATORY CONTEXT

The breeding bird monitoring program addresses conditions of the Project's Environmental Assessment Certificate (EAC), the Federal Decision Statement (FDS) and the Project's two Conditional Water Licences. Specifically, the program addresses Condition 21 of the provincial EAC to include surveys of songbirds as part of a Vegetation and Wildlife Mitigation and Monitoring Plan. It also addresses Conditions 10, 11 and 16 of the FDS which outlines requirements to monitor for project-related effects to non-wetland migratory bird habitat, wetland migratory bird habitat, and species at risk. Finally, the program fulfils monitoring and reporting obligations tied to Conditional Water Licences 132990 and 132991, where songbirds are included under *Program Area 8: Breeding and Migratory Birds* for review by the Vegetation and Wildlife Technical Committee (VWTC). Together, the conditions of the EAC, FDS and water licences establish the purpose of the breeding bird monitoring program (BC Hydro 2018).

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<sup>2</sup> Woodpecker and Common Nighthawk surveys are also included under BC Hydro's Breeding Bird Follow-up Monitoring Program.

### 3.0 PROGRAM HISTORY

Point counts for the baseline (2006 – 2012) and the follow-up monitoring programs (2016 – 2025) have been conducted throughout the Peace River valley (and its tributaries) and in the adjacent plateau areas, both inside and outside the Project footprint (Figure 1; Hilton et al. 2013; SEES JV 2017; SEES JV 2018; SEES JV 2019; SEES JV 2020a; SEES JV 2020b; SEES JV 2022a; SEES JV 2022b; SEES JV 2024; SEES JV 2025).

Point counts conducted between 2006 and 2019 were located throughout the reservoir footprint, in the dam site area, the Peace River valley outside the footprint, the transmission line area south of the Peace River valley and downstream of the dam site (Figure 1). Clearing of the dam site area was completed in 2016. Clearing of the reservoir footprint occurred from 2017 to 2023 and incrementally progressed westward from the dam site in each year. In 2020, semi-permanent monitoring stations were established upstream of the dam site, within the Peace River valley. The majority of these stations were located outside of the reservoir footprint, but some were located within the reservoir footprint west of the Halfway River. The semi-permanent monitoring stations were surveyed annually from 2020 to 2024.

The point counts conducted in 2025 were the first songbird surveys conducted after inundation of the reservoir. Seventy-five of the semi-permanent monitoring stations established in 2020 were still accessible after reservoir filling and 27 new monitoring stations were established in 2025 to replace the 27 stations that had been lost (Figure 1). All point counts in 2025 were located upstream of the dam site within the Peace River Valley or within the three mitigation properties (Figures 2 to 5; Appendix A).

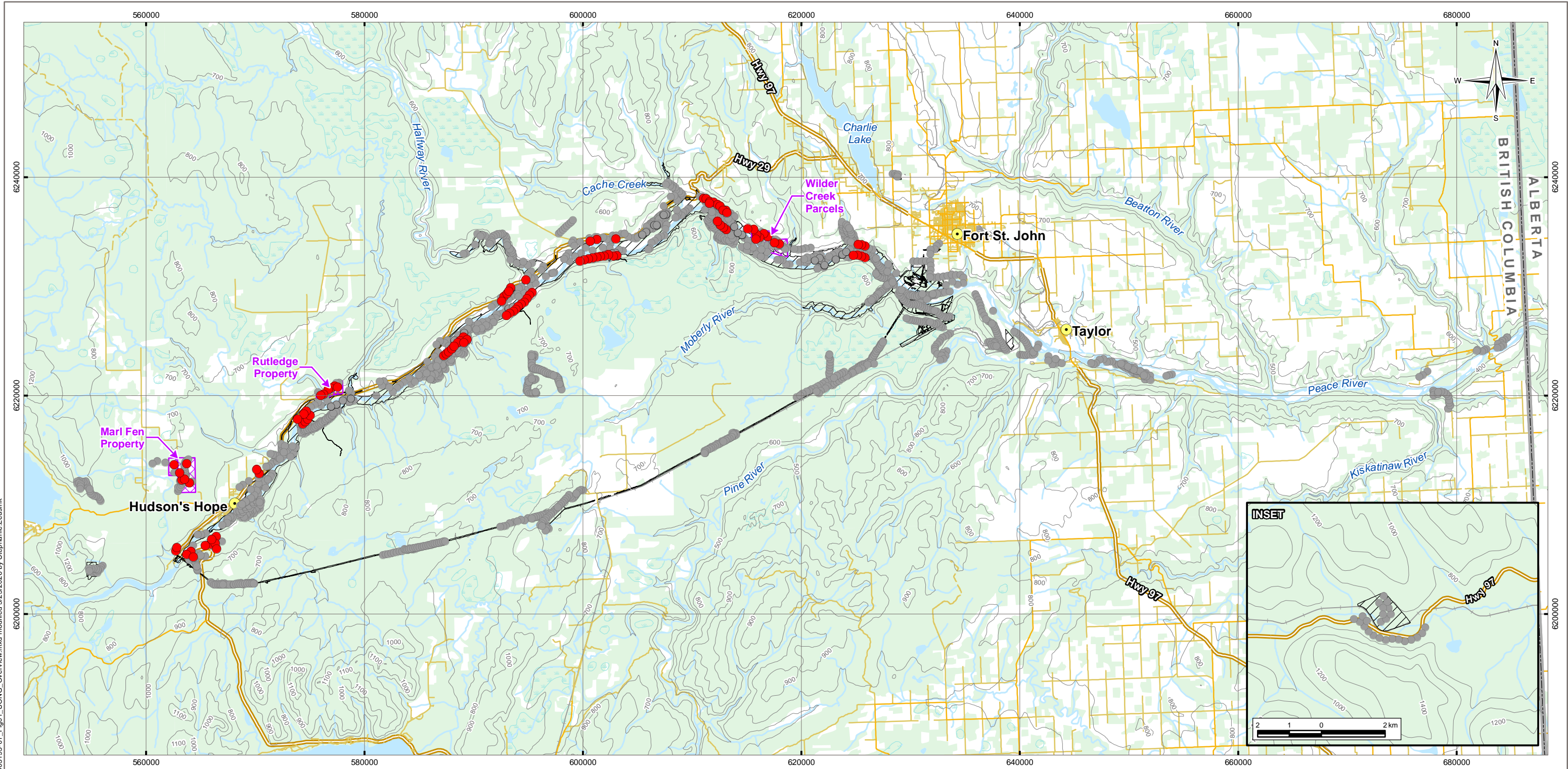
### 4.0 METHODS

#### 4.1 Survey Locations in 2025

In 2025, point count surveys were conducted at 102 stations located between the dam site and Hudson’s Hope, including stations in each of BC Hydro’s three mitigation properties, Wilder Creek, Rutledge and Marl Fen (Figures 2 to 5). Of the 102 stations, 75 stations surveyed in 2025 were a continuation of the semi-permanent stations established in 2020, and 27 new stations were established. Each station was located in accessible areas (slopes that can be traversed on foot) and stratified by bird habitat class in proportion to the mapped area of each class in the Peace River valley (Table 1). Bird habitat classes were derived from the detailed ecosystem units used in the Terrestrial Ecosystem Mapping and are generalized groups of similar ecosystems. Candidate locations were then manually adjusted to be 100 m from a habitat edge (e.g., forest-wetland transition) where possible and some locations were linked to form a sequence of survey locations that could be visited on foot.

**Table 1: Bird Habitat Classes Derived from Terrestrial Ecosystem Mapping**

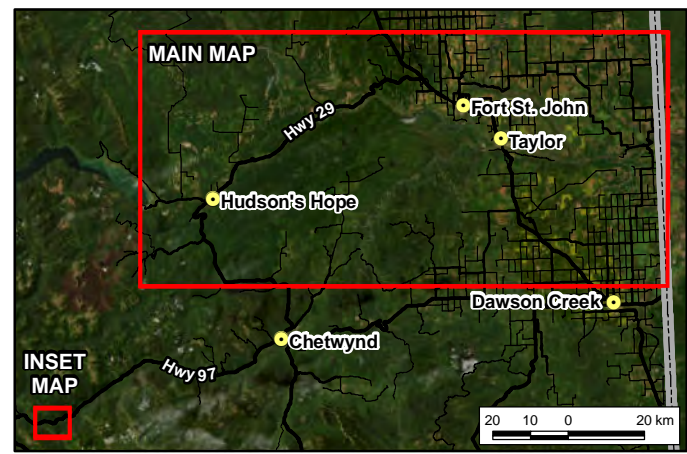
Coniferous-shrub	Deciduous-mature forest	Wetland-graminoid
Coniferous-young forest	Riparian-mixed shrub	Wetland-shrub
Coniferous-mature forest	Riparian-mixed young forest	Dry slopes-grassland
Deciduous-shrub	Riparian-mixed mature forest	Dry slopes-shrubland
Deciduous-young forest	Fen/bog-shrub	Cultivated



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**LEGEND**

- |                                  |   |                     |
|----------------------------------|---|---------------------|
| <b>Songbird Survey Locations</b> | <span style="color: yellow;">●</span> Populated Place | Contour (100 m)     |
| <b>Survey Year</b>               | 2025  | Watercourse         |
|                                  | 2006 to 2024  | Waterbody           |
| Project Footprint                | Highway   | Wetland             |
| Potential Mitigation Property    | Main Road   | Wooded Area         |
|                                  | Local Road  | Provincial Boundary |
|                                  | Resource/Recreational Road                            |                     |
|                                  | Railway   |                     |
|                                  | Residential Area                                      |                     |



**NOTES**  
Base data source: CanVec 1:250,000.

**SITE C SONGBIRD 2025 ANNUAL REPORT**

**Songbird Survey Locations**

PROJECTION UTM Zone 10	DATUM NAD83	CLIENT BC Hydro Power smart
Scale: 1:350,000		
FILE NO. BIOS03193-01_Fig01_SONG_Overview.mxd		
OFFICE Tl-VANC	DWN SL	CKD MRB
APVD EH	REV 0	
DATE March 23, 2026	PROJECT NO. ENW.BIOS03193-01	

**Figure 1**

**STATUS**  
ISSUED FOR USE

## 4.2 Point Count Surveys

Point counts were conducted on June 3 to 25, 2025 by two teams. Each team was composed of a Qualified Environmental Professional (QEP) Biologist with songbird survey experience and either a First Nations assistant or wildlife technician (Appendix B). Each station was to be surveyed (visited) two times, with at least two weeks between visits, to maximize the detection of early and late breeders.

Point count survey methodology was adapted from the Resource Inventory Standards Committee (RISC) *Inventory Methods for Forest and Grassland Songbirds* (RISC 1999). Surveyors conducted unlimited-radius point counts with distance-to-detection intervals set at 0-50 m, 51-100 m and >100 m. Each point count survey was conducted over ten minutes and bird detections were recorded in three intervals: 0-3 minutes, 3-5 minutes, and 5-10 minutes. Point counts took place from sunrise to approximately four hours after sunrise, and only during acceptable weather conditions for songbird surveys (Table 2). After arriving at each station, the surveyor waited one minute, then commenced the 10-minute survey period and recorded all birds seen and/or heard. Data were recorded on a modified version of the RISC Songbird Point Count data form (RISC 1999).

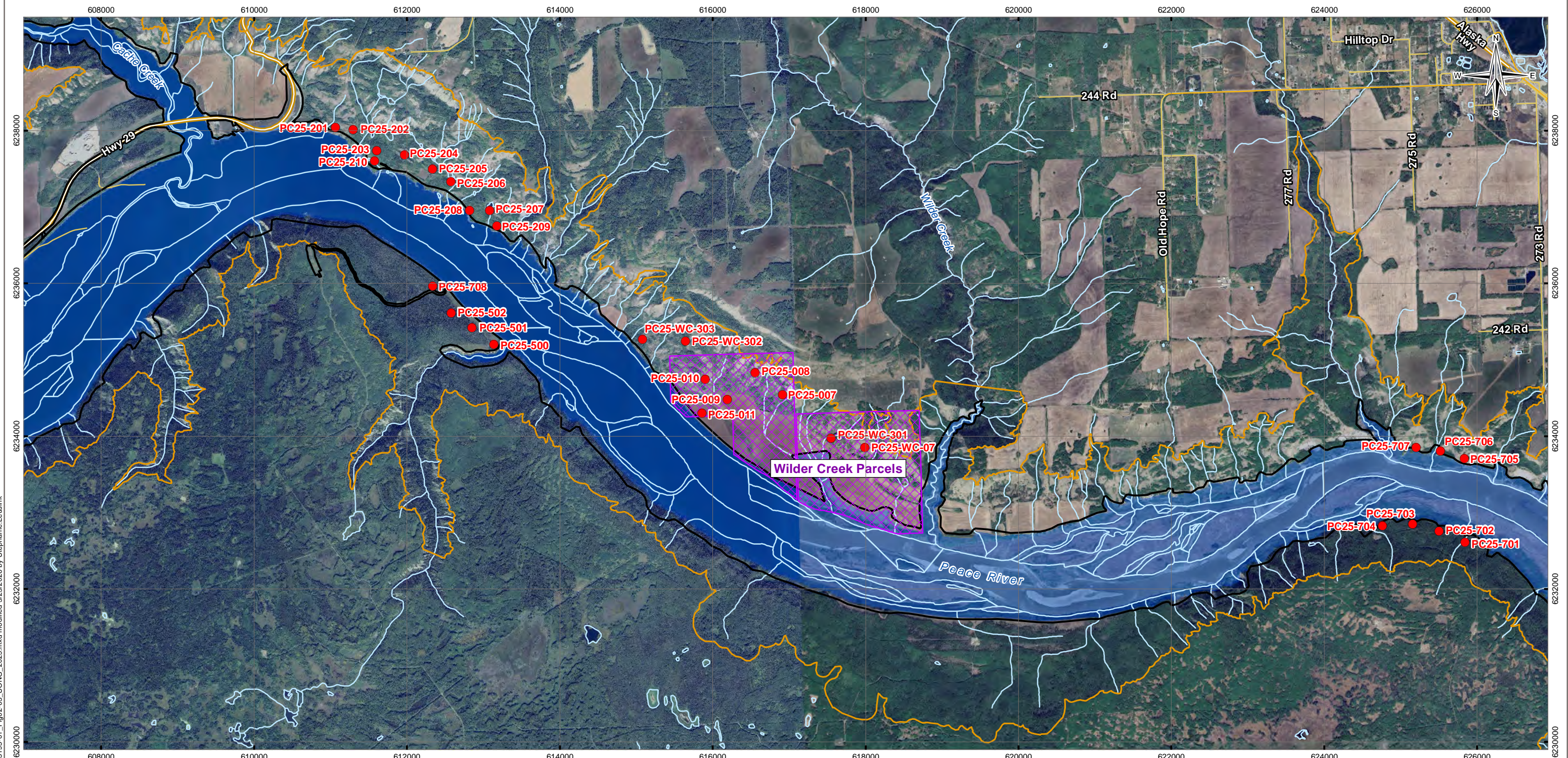
**Table 2: Acceptable and Unacceptable Weather Conditions for Songbird Surveys (RISC 1999)**

	Acceptable	Unacceptable
Wind	<ul style="list-style-type: none"> <li>▪ Beaufort 0 (&lt; 2 km/hr). Calm.</li> <li>▪ Beaufort 1 (2-5 km/hr). Light air.</li> <li>▪ Beaufort 2 (6-12 km/hr). Light breeze, leaves rustle.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Beaufort 3 (12-19 km/hr). Gentle breeze leaves and twigs constantly move.</li> <li>▪ Beaufort 4 (20-29 km/hr). Moderate breeze, small branches move, dust rises.</li> <li>▪ Beaufort 5 (30-39 km/hr). Fresh breeze, small trees sway.</li> <li>▪ Beaufort &gt;5</li> </ul>
Precipitation	<ul style="list-style-type: none"> <li>▪ None</li> <li>▪ Fog</li> <li>▪ Misty drizzle</li> <li>▪ Drizzle</li> </ul>	<ul style="list-style-type: none"> <li>▪ Light rain</li> <li>▪ Hard rain</li> <li>▪ Snow</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>▪ &gt;3 °C during the breeding season in central &amp; northern interior of British Columbia</li> </ul>	<ul style="list-style-type: none"> <li>▪ &lt;3 °C during the breeding in central &amp; northern interior of British Columbia</li> </ul>

Incidental observations were recorded when non-songbird species were observed during surveys, or when any bird species at risk were observed outside of survey stations (e.g., when surveyors were traveling between stations) or survey periods (e.g., before or after daily observations have started/finished). For each incidental observation, date, time, GPS location, and habitat were recorded.

For the purposes of this report, bird species at risk included:

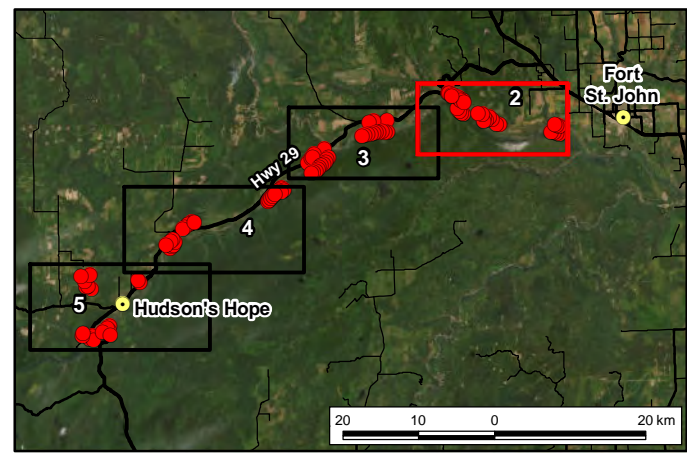
1. Species considered endangered, threatened, or special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
2. Species considered endangered, threatened, or special concern under *Species at Risk Act* (SARA); and/or
3. Species listed as Red (endangered, threated) or Blue (special concern) on the BC List.



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**LEGEND**

- 2025 Songbird Survey Location
- Project Footprint
- Potential Mitigation Property
- Peace River Valley
- Site C Reservoir
- Highway
- Local Road
- Main Road
- Watercourse
- Waterbody

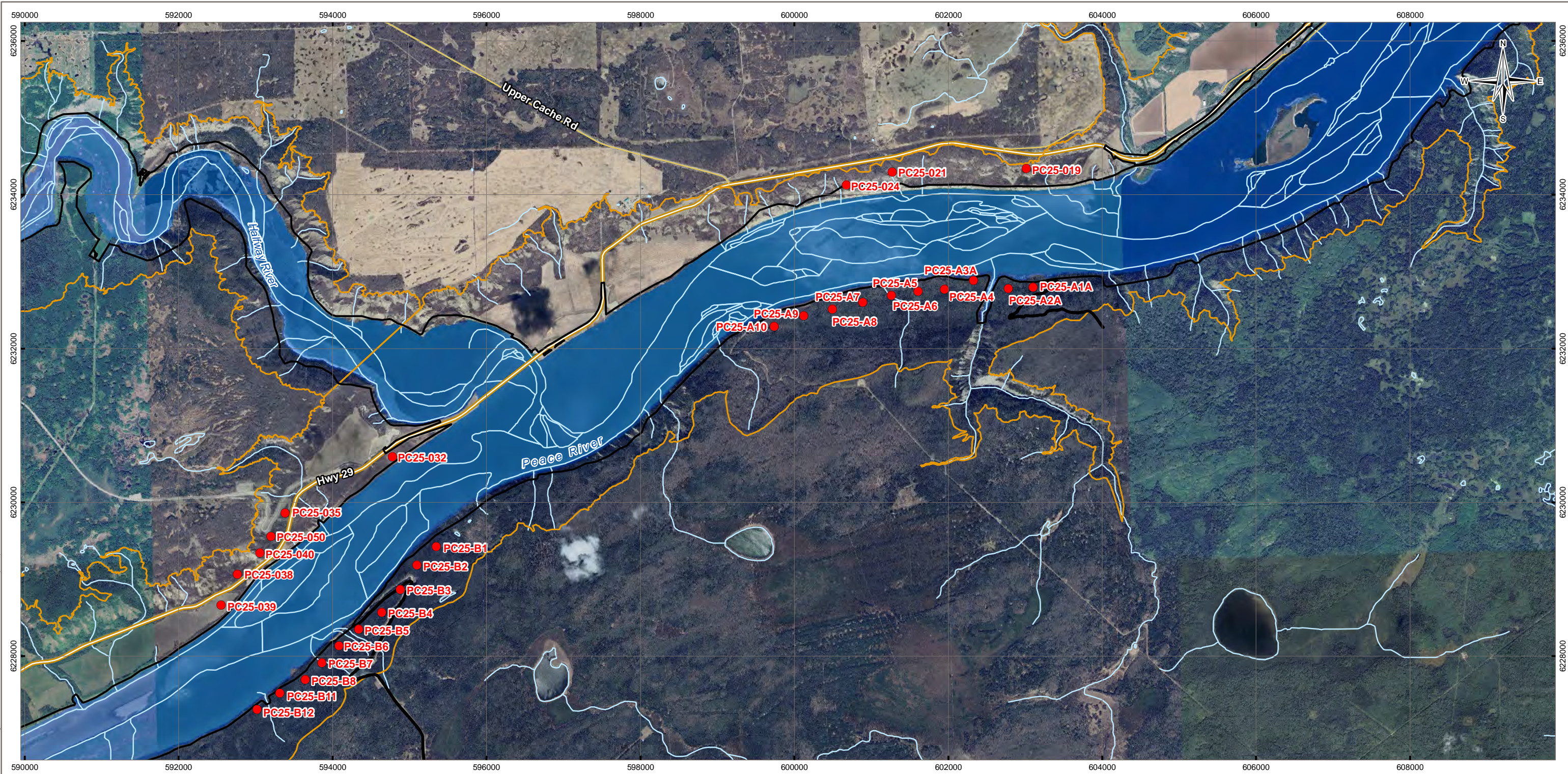


**NOTES**  
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 CanVec 1:50,000 (2019)  
 Imagery from ESRI; Maxar

**STATUS**  
 ISSUED FOR USE

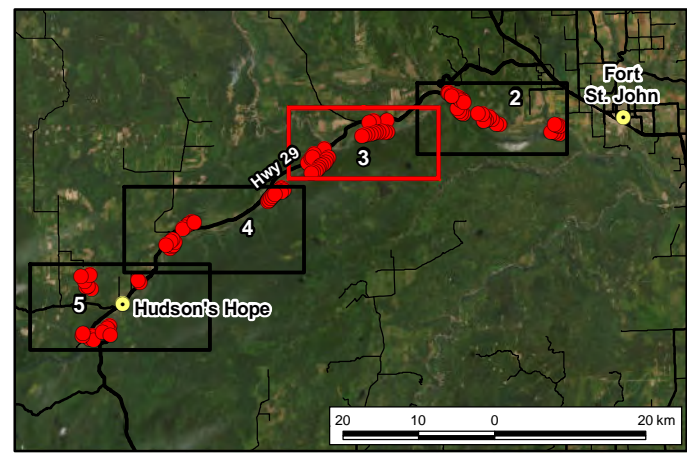
<b>SITE C SONGBIRD 2025 ANNUAL REPORT</b>			
<b>2025 Songbird Survey Locations Dam Site to Cache Creek</b>			
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FILE NO. BIOS03193-01_Fig02-05_SONG_2025.mxd			
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD EH
DATE March 23, 2026	PROJECT NO. ENW.BIOS03193-01		
			<b>Figure 2</b>





**LEGEND**

- 2025 Songbird Survey Location
- Project Footprint
- Peace River Valley
- Site C Reservoir
- Highway
- Local Road
- Watercourse
- Waterbody



**NOTES**  
 Base data source:  
 CanVec 1:50,000 (2019)  
 Imagery from ESRI; Maxar

**SITE C SONGBIRD  
2025 ANNUAL REPORT**

**2025 Songbird Survey Locations  
Cache Creek to Halfway River**

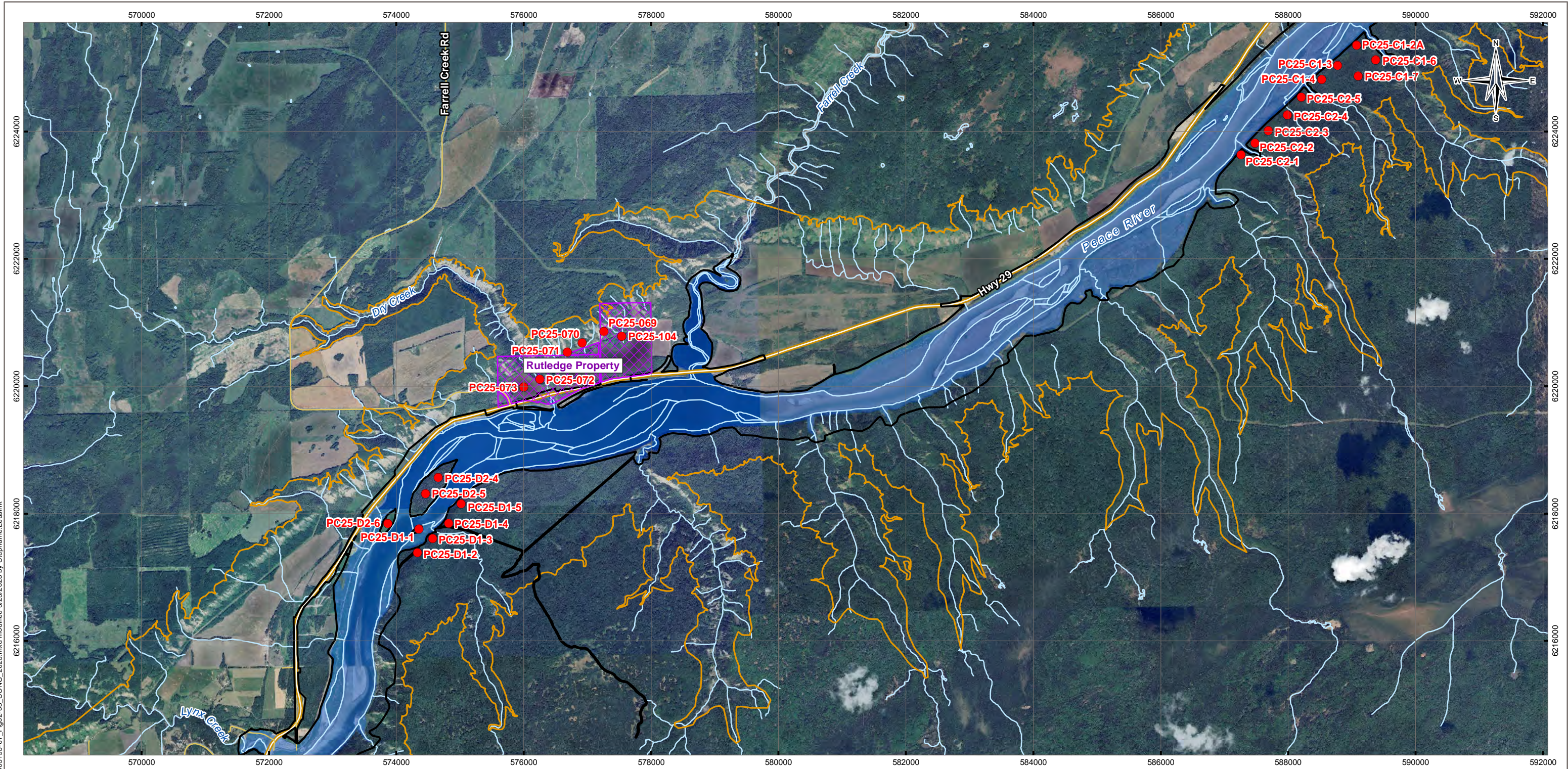
PROJECTION UTM Zone 10	DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart
Scale: 1:50,000		
FILE NO. BIOS03193-01_Fig02-05_SONG_2025.mxd		
OFFICE Tt-VANC	DWN SL	CKD MRB
APVD EH	REV 0	
DATE March 23, 2026	PROJECT NO. ENW.BIOS03193-01	



**Figure 3**

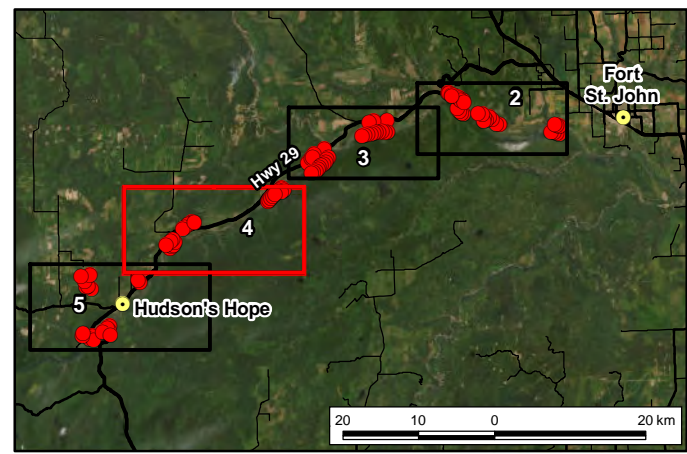
**STATUS**  
ISSUED FOR USE

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**LEGEND**

- 2025 Songbird Survey Location
- Project Footprint
- Potential Mitigation Property
- Peace River Valley
- Site C Reservoir
- Highway
- Local Road
- Watercourse
- Waterbody



**NOTES**  
 Base data source:  
 CanVec 1:50,000 (2019)  
 Imagery from ESRI; Maxar

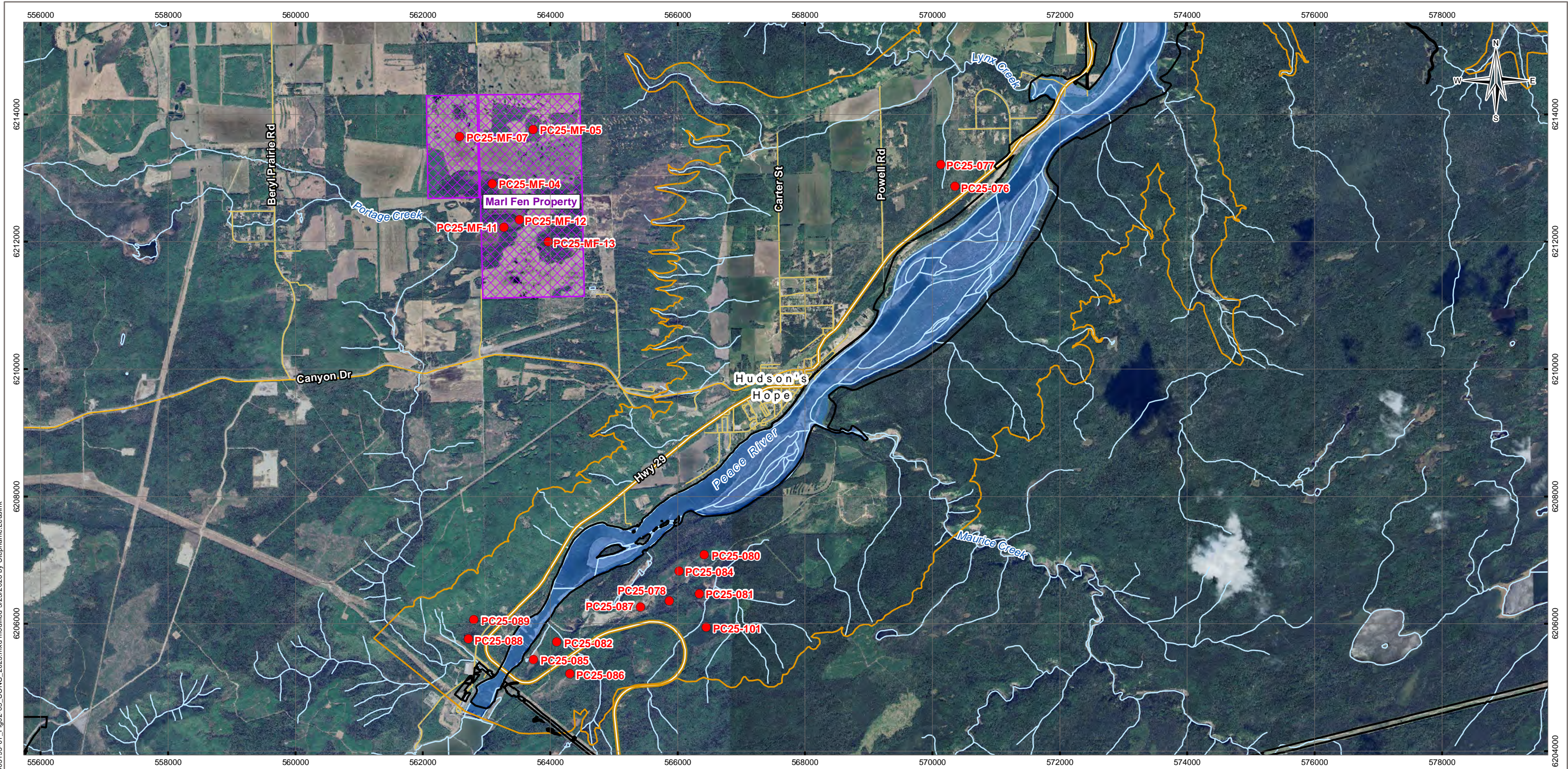
**SITE C SONGBIRD  
2025 ANNUAL REPORT**

**2025 Songbird Survey Locations  
Halfway River to Lynx Creek**

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT <b>BC Hydro</b> Power smart	
Scale: 1:60,000					
FILE NO. BIOS03193-01_Fig02-05_SONG_2025.mxd					
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD EH	REV 0	<b>Figure 4</b>
DATE March 23, 2026	PROJECT NO. ENW.BIOS03193-01				

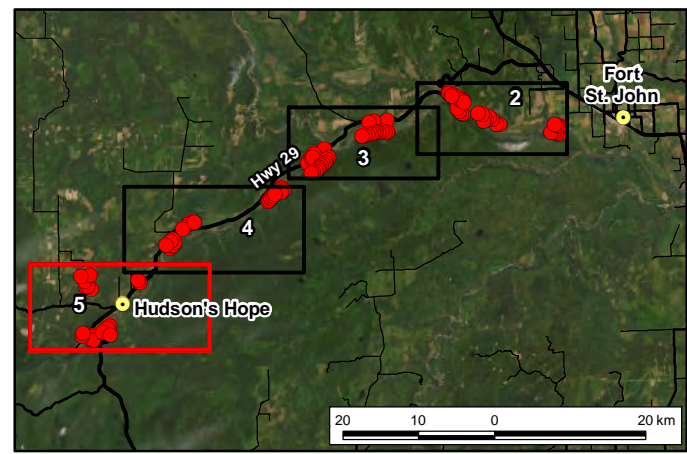
**STATUS**  
ISSUED FOR USE

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**LEGEND**

- 2025 Songbird Survey Location
- Project Footprint
- Potential Mitigation Property
- Peace River Valley
- Site C Reservoir
- Highway
- Local Road
- Main Road
- Watercourse
- Waterbody



**NOTES**  
 Base data source:  
 CanVec 1:50,000 (2019)  
 Imagery from ESRI; Maxar

**SITE C SONGBIRD  
 2025 ANNUAL REPORT**

**2025 Songbird Survey Locations  
 Lynx Creek to Hudson's Hope**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:60,000 1 0.5 0 1 Kilometres				
<b>FILE NO.</b> BIOS03193-01_Fig02-05_SONG_2025.mxd				
<b>OFFICE</b> Tl-VANC	<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> EH	<b>REV</b> 0
<b>DATE</b> March 23, 2026	<b>PROJECT NO.</b> ENW.BIOS03193-01			



**Figure 5**

**STATUS**  
 ISSUED FOR USE

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### 4.3 Preliminary Community Trend Analysis

Breeding songbird surveys have been conducted in the Peace River valley between 2006 and 2012 as part of baseline data collection. Following Project approval, surveys conducted in 2016 used the same five-minute, fixed radius point count methodology to maintain comparability with baseline conditions. After 2016, the Program Plan and monitoring objectives were refined and point count methods were updated to ten-minute, unlimited radius surveys, with time to first detection and distance to detection recorded. This approach improved detection rates, while still allowing the ten-minute data to be subset to be comparable with earlier five-minute, fixed radius surveys.

Preliminary trends in high-level songbird community metrics were examined using survey species richness and total detections derived from point count surveys. These metrics provide a broad indication of changes in the songbird community over time and are well suited for an initial, descriptive assessment of the developing dataset. At this stage, analyses are limited to surveys conducted between 2017 and 2025, when a consistent ten-minute, unlimited radius point count methodology was applied. Earlier surveys conducted between 2006 and 2016 form an important part of the long-term dataset, but differences in survey design and effort require additional data preparation and analytical refinement before they can be fully integrated into formal trend analyses. As a result, the information presented here is intended to provide a preliminary view of patterns in species richness and detections based on recent monitoring years, while more detailed and rigorous analyses incorporating the full baseline to operations dataset will be completed in future reporting.

When evaluating preliminary trends in survey species richness and total detections, it is important to account for differences in survey conditions and sampling design that can influence detection rates. Key survey level variables considered include time since sunrise, day of year, and differences in sampling intensity among bird habitat classes. These factors can introduce systematic variation in observed counts that is unrelated to underlying differences in the songbird community. To address this, preliminary analyses were conducted using a generalized linear mixed modelling (GLMM) framework, which allows survey level covariates to be incorporated while accounting for repeated sampling at stations and across years. Results from these analyses are presented at a descriptive level only, and more detailed model-based evaluations of trends will be completed in future reporting.

## 5.0 RESULTS

### 5.1 Songbird Surveys in 2025

Surveys were conducted at 102 point count stations within 14 of the 15 bird habitat classes (Table 3; Figures 2 to 5; Appendix A). With the exception of two stations (i.e., PC25-MF-11 and PC25-MF-12<sup>3</sup>), each point count station was surveyed twice. A total of 202 surveys were conducted in 2025.

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<sup>3</sup> An error during fieldwork resulted in survey of an incorrect station (PC25-MF-12) during the second round of surveys instead of the intended station (PC25-MF-11). PC25-MF-11 should continue to be surveyed in subsequent monitoring years.

**Table 3: Point Count Stations and Surveys Conducted in 2025 by Bird Habitat Class**

Bird Habitat Class	Stations	Surveys
Coniferous-shrub	1	2
Coniferous-young forest	12	24
Coniferous-mature forest	19	38
Deciduous-shrub	9	18
Deciduous-young forest	13	26
Deciduous-mature forest	17	34
Riparian-mixed shrub	1	2
Riparian-mixed young forest	2	4
Riparian-mixed mature forest <sup>4</sup>	0	0
Fen/bog-shrub	2	3
Wetland-graminoid	1	1
Wetland-shrub	4	8
Dry slopes-grassland	4	8
Dry slopes-shrubland	12	24
Cultivated	5	10
<b>Total</b>	<b>102</b>	<b>202</b>

Surveys were conducted in appropriate weather conditions with temperatures ranging from 5.0 °C to 16.0 °C and wind speed between zero and two on the Beaufort scale. There was one survey during the first visit where winds gusted as high as 3 on the Beaufort scale. The majority of surveys were conducted in the absence of precipitation and thirteen surveys were conducted in fog or drizzle. One survey during the first visit was conducted during light rain but bird activity did not appear to be diminished, so the survey results were included (Appendix A).

A total of 87 bird species were detected, of which 68 were songbirds (Table 4). Five songbird species listed under COSEWIC, SARA and/or British Columbia's Red and Blue lists were observed during the surveys. The median number of songbird species detected per point count survey was 9 (ranging from 1 to 18). Other bird species not classified as songbirds were recorded as incidental observations and are listed in Appendix C. Bird species detected outside of survey periods are also included in Appendix C.

<sup>4</sup> Following inundation, mapped areas of riparian-mixed mature forest were no longer available to surveyed.

**Table 4: Songbird Species Observed during the 2025 Point Count Surveys, Listed in Taxonomic Order**

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	Survey Detections	Flyovers
1	Belted Kingfisher	<i>Megaceryle alcyon</i>	Yellow	-	-	2	0
2	Northern Flicker*	<i>Colaptes auratus</i>	Yellow	-	-	5	0
3	Hairy Woodpecker*	<i>Dryobates villosus</i>	Yellow	-	-	2	0
4	Pileated Woodpecker*	<i>Dryocopus pileatus</i>	Yellow	-	-	5	0
5	American Three-toed Woodpecker*	<i>Picoides dorsalis</i>	Yellow	-	-	4	0
6	Yellow-bellied Sapsucker*	<i>Sphyrapicus varius</i>	Yellow	-	-	27	0
7	Western Wood-Pewee	<i>Contopus sordidulus</i>	Yellow	-	-	37	0
8	Alder Flycatcher	<i>Empidonax alnorum</i>	Yellow	-	-	46	0
9	Western Flycatcher	<i>Empidonax difficilis</i>	Yellow	-	-	2	0
10	Least Flycatcher	<i>Empidonax minimus</i>	Yellow	-	-	147	0
11	Eastern Kingbird	<i>Tyrannus tyrannus</i>	Yellow	-	-	1	0
12	Warbling Vireo	<i>Vireo gilvus</i>	Yellow	-	-	24	0
13	Red-eyed Vireo	<i>Vireo olivaceus</i>	Yellow	-	-	265	0
14	Blue-headed Vireo	<i>Vireo solitarius</i>	Yellow	-	-	16	0
15	American Crow	<i>Corvus brachyrhynchos</i>	Yellow	-	-	101	0
16	Common Raven	<i>Corvus corax</i>	Yellow	-	-	49	3
17	Blue Jay	<i>Cyanocitta cristata</i>	Yellow	-	-	3	0
18	Canada Jay	<i>Perisoreus canadensis</i>	Yellow	-	-	3	0
19	Black-billed Magpie	<i>Pica hudsonia</i>	Yellow	-	-	5	0
20	Cedar Waxwing	<i>Bombycilla cedrorum</i>	Yellow	-	-	27	7
21	Black-capped Chickadee	<i>Poecile atricapillus</i>	Yellow	-	-	36	0
22	Boreal Chickadee	<i>Poecile hudsonicus</i>	Yellow	-	-	3	0
23	Bank Swallow	<i>Riparia riparia</i>	Yellow	Threatened	Threatened	2	0
24	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Yellow	-	-	6	0
25	Tree Swallow	<i>Tachycineta bicolor</i>	Yellow	-	-	1	0
26	Violet-green Swallow	<i>Tachycineta thalassina</i>	Yellow	-	-	27	3
27	Ruby-crowned Kinglet	<i>Corthylio calendula</i>	Yellow	-	-	17	0

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	Survey Detections	Flyovers
28	Golden-crowned Kinglet	<i>Regulus satrapa</i>	Yellow	-	-	16	0
29	Marsh Wren	<i>Cistothorus palustris</i>	Yellow	-	-	1	0
30	Red-breasted Nuthatch	<i>Sitta canadensis</i>	Yellow	-	-	48	0
31	White-breasted Nuthatch	<i>Sitta carolinensis</i>	Yellow	-	-	1	0
32	Winter Wren	<i>Troglodytes hiemalis</i>	Blue	-	-	2	0
33	Brown Creeper	<i>Certhia americana</i>	Yellow	-	-	4	0
34	Gray Catbird	<i>Dumetella carolinensis</i>	Yellow	-	-	19	0
35	Hermit Thrush	<i>Catharus guttatus</i>	Yellow	-	-	21	0
36	Swainson's Thrush	<i>Catharus ustulatus</i>	Yellow	-	-	170	0
37	American Robin	<i>Turdus migratorius</i>	Yellow	-	-	86	0
38	Purple Finch	<i>Haemorhous purpureus</i>	Yellow	-	-	10	0
39	White-winged Crossbill	<i>Loxia leucoptera</i>	Yellow	-	-	27	1
40	Pine Siskin	<i>Spinus pinus</i>	Yellow	-	-	6	6
41	Canada Warbler	<i>Cardellina canadensis</i>	Blue	Special Concern	Threatened	20	0
42	Wilson's Warbler	<i>Cardellina pusilla</i>	Yellow	-	-	2	0
43	Mourning Warbler	<i>Geothlypis philadelphia</i>	Yellow	-	-	6	0
44	Common Yellowthroat	<i>Geothlypis trichas</i>	Yellow	-	-	37	0
45	Orange-crowned Warbler	<i>Leiothlypis celata</i>	Yellow	-	-	32	0
46	Tennessee Warbler	<i>Leiothlypis peregrina</i>	Yellow	-	-	11	0
47	Black-and-white Warbler	<i>Mniotilta varia</i>	Yellow	-	-	33	0
48	Northern Waterthrush	<i>Parkesia noveboracensis</i>	Yellow	-	-	24	0
49	Ovenbird	<i>Seiurus aurocapilla</i>	Yellow	-	-	159	0
50	Yellow-rumped Warbler	<i>Setophaga coronata</i>	Yellow	-	-	112	0
51	Magnolia Warbler	<i>Setophaga magnolia</i>	Yellow	-	-	35	0
52	Yellow Warbler	<i>Setophaga petechia</i>	Yellow	-	-	196	0
53	American Redstart	<i>Setophaga ruticilla</i>	Yellow	-	-	64	0
54	Black-throated Green Warbler	<i>Setophaga virens</i>	Blue	-	-	3	0
55	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Yellow	-	-	31	2
56	Baltimore Oriole	<i>Icterus galbula</i>	Blue	-	-	4	0

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	Survey Detections	Flyovers
57	Brown-headed Cowbird	<i>Molothrus ater</i>	Yellow	-	-	9	0
58	Dark-eyed Junco	<i>Junco hyemalis</i>	Yellow	-	-	31	0
59	Swamp Sparrow	<i>Melospiza georgiana</i>	Yellow	-	-	3	0
60	Lincoln's Sparrow	<i>Melospiza lincolnii</i>	Yellow	-	-	14	0
61	Song Sparrow	<i>Melospiza melodia</i>	Yellow	-	-	61	0
62	Savannah Sparrow	<i>Passerculus sandwichensis</i>	Yellow	-	-	9	0
63	Vesper Sparrow	<i>Pooecetes gramineus</i>	Yellow	-	-	17	0
64	Clay-colored Sparrow	<i>Spizella pallida</i>	Yellow	-	-	79	0
65	Chipping Sparrow	<i>Spizella passerina</i>	Yellow	-	-	26	0
66	White-throated Sparrow	<i>Zonotrichia albicollis</i>	Yellow	-	-	301	0
67	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Yellow	-	-	21	0
68	Western Tanager	<i>Piranga ludoviciana</i>	Yellow	-	-	69	0
<b>Total Counts:</b>						2683	22

\* Includes woodpeckers. Although not songbirds, woodpeckers are part of the Breeding Bird Follow-up Monitoring Program (surveyed separately from songbirds) and are regularly detected during point counts.

## 5.2 Preliminary Community Trend Analysis

Data collected over multiple survey years are being assembled into a consistent dataset that will support future, rigorous analyses of trends and Project-related effects from baseline through construction and into operations. The information presented here provides a preliminary view of survey effort and results to date and is intended to summarize the developing dataset rather than present detailed statistical analyses, which will be completed in future reporting. Since 2006, 5,284 surveys at 2,777 distinct locations have been conducted (Table 5).

**Table 5: Locations and Surveys Conducted for Songbirds Since 2006**

Year	Inventory Type	Stations	Surveys
2006	5 min, 100m fixed radius	307	478
2008	5 min, 100m fixed radius	393	779
2011	5 min, 100m fixed radius	716	1077
2012	5 min, 100m fixed radius	243	740
2016	5 min, 100m fixed radius	143	275
2017	10 min, unlimited radius	179	358
2018	10 min, unlimited radius	115	226
2019	10 min, unlimited radius	72	143
2020	10 min, unlimited radius	97	188
2021	10 min, unlimited radius	103	206
2022	10 min, unlimited radius	103	204
2023	10 min, unlimited radius	102	204
2024	10 min, unlimited radius	102	204
2025	10 min, unlimited radius	102	202
<b>Total</b>		<b>2,777</b>	<b>5,284</b>

Songbird species detections recorded during breeding point count surveys since 2006 are summarized in Table 6. In total, 111 songbird species have been recorded during surveys. This table presents raw detection totals by species and year and provides a complete record of observations collected across baseline and follow-up monitoring periods and across all areas (Peace River valley upstream of the dam, the Peace River valley downstream of the dam, and the transmission line area). The data are presented without adjustment for survey effort or methodological changes and are intended to document presence and relative frequency of species over time. These raw detections form the foundation for future analyses of trends in species occurrence, abundance, and community composition as the long-term monitoring dataset continues to develop.

Fourteen species listed as at risk in British Columbia (Red or Blue listed) or in Canada (COSEWIC and/or SARA listed) have been detected since 2006 (Table 6): Common Nighthawk, Winter Wren, Olive-sided Flycatcher, Barn Swallow, Bank Swallow, Canada Warbler, Connecticut Warbler, Bay-breasted Warbler, Cape May Warbler, Black-throated Green Warbler, Rusty Blackbird, Baltimore Oriole, Nelson's Sparrow, and Evening Grosbeak.

**Table 6: Songbird Detections 2006-2025**

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	2006	2008	2011	2012	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<i>Surveys Conducted</i>						478	779	1077	740	275	358	226	143	188	206	204	204	204	202	5284
1	Mourning Dove	<i>Zenaida macroura</i>	Yellow	-	-	0	1	1	0	1	0	0	0	0	0	0	1	0	0	4
2	Common Nighthawk	<i>Chordeiles minor</i>	Blue	Special Concern	Special Concern	0	2	1	3	1	0	0	0	0	0	0	0	0	0	7
3	Northern Flicker	<i>Colaptes auratus</i>	Yellow	-	-	19	29	111	36	25	33	19	5	5	2	3	16	10	5	318
4	Downy Woodpecker	<i>Dryobates pubescens</i>	Yellow	-	-	10	15	19	37	6	3	1	1	1	2	3	5	3	0	106
5	Hairy Woodpecker	<i>Dryobates villosus</i>	Yellow	-	-	43	43	62	21	1	10	8	4	3	3	3	3	1	2	207
6	Pileated Woodpecker	<i>Dryocopus pileatus</i>	Yellow	-	-	21	21	15	9	2	8	4	5	1	3	1	4	4	5	103
7	American Three-toed Woodpecker	<i>Picoides dorsalis</i>	Yellow	-	-	4	29	67	23	2	1	14	4	2	6	2	2	0	4	160
8	Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	Yellow	-	-	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
9	Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Yellow	-	-	195	264	555	330	43	59	40	45	29	17	12	26	31	27	1673
10	Olive-sided Flycatcher	<i>Contopus cooperi</i>	Yellow	Special Concern	Special Concern	13	11	22	1	13	13	2	5	5	11	3	5	7	0	111
11	Western Wood-Pewee	<i>Contopus sordidulus</i>	Yellow	-	-	70	71	65	32	16	33	26	9	25	31	26	42	43	37	526
12	Alder Flycatcher	<i>Empidonax alnorum</i>	Yellow	-	-	25	110	161	89	52	32	44	8	39	42	54	90	60	46	852
13	Western Flycatcher	<i>Empidonax difficilis</i>	Yellow	-	-	16	19	27	1	0	3	7	8	8	4	7	6	10	2	118
14	Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	Yellow	-	-	2	17	3	19	0	0	0	0	0	0	1	0	1	0	43
15	Hammond's Flycatcher	<i>Empidonax hammondi</i>	Yellow	-	-	7	2	1	51	4	0	0	0	0	2	0	1	0	0	68
16	Least Flycatcher	<i>Empidonax minimus</i>	Yellow	-	-	336	662	784	467	92	120	106	33	88	125	108	178	163	148	3410
17	Dusky Flycatcher	<i>Empidonax oberholseri</i>	Yellow	-	-	0	0	1	9	0	0	5	0	2	0	1	0	1	0	19
18	Eastern Phoebe	<i>Sayornis phoebe</i>	Yellow	-	-	10	7	6	13	1	0	1	0	0	0	2	0	1	0	41
19	Say's Phoebe	<i>Sayornis saya</i>	Yellow	-	-	0	1	3	0	0	0	0	0	0	0	0	0	0	0	4
20	Eastern Kingbird	<i>Tyrannus tyrannus</i>	Yellow	-	-	6	6	10	0	4	3	0	0	0	4	8	5	5	1	52
21	Northern Shrike	<i>Lanius borealis</i>	Yellow	-	-	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
22	Cassin's Vireo	<i>Vireo cassinii</i>	Yellow	-	-	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
23	Warbling Vireo	<i>Vireo gilvus</i>	Yellow	-	-	179	290	318	330	39	44	20	31	33	30	38	33	41	24	1450
24	Red-eyed Vireo	<i>Vireo olivaceus</i>	Yellow	-	-	353	462	482	226	128	298	268	70	137	169	183	269	259	266	3570
25	Philadelphia Vireo	<i>Vireo philadelphicus</i>	Yellow	-	-	3	3	1	1	0	4	0	1	2	1	4	3	0	0	23
26	Blue-headed Vireo	<i>Vireo solitarius</i>	Yellow	-	-	37	39	47	43	14	9	11	3	7	8	10	17	9	16	270
27	American Crow	<i>Corvus brachyrhynchos</i>	Yellow	-	-	71	82	108	57	7	27	38	16	22	25	28	37	74	101	693
28	Common Raven	<i>Corvus corax</i>	Yellow	-	-	47	76	91	376	160	150	113	33	25	32	14	9	26	52	1204
29	Blue Jay	<i>Cyanocitta cristata</i>	Yellow	-	-	16	5	22	4	8	21	7	3	2	1	0	2	3	3	97
30	Canada Jay	<i>Perisoreus canadensis</i>	Yellow	-	-	55	60	78	37	12	19	7	11	16	11	9	6	1	3	325

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	2006	2008	2011	2012	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<i>Surveys Conducted</i>						478	779	1077	740	275	358	226	143	188	206	204	204	204	202	5284
31	Black-billed Magpie	<i>Pica hudsonia</i>	Yellow	-	-	14	3	18	36	19	37	28	4	6	16	7	3	11	5	207
32	Cedar Waxwing	<i>Bombycilla cedrorum</i>	Yellow	-	-	32	33	102	45	87	43	38	26	60	37	31	100	90	34	758
33	Bohemian Waxwing	<i>Bombycilla garrulus</i>	Yellow	-	-	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
34	Black-capped Chickadee	<i>Poecile atricapillus</i>	Yellow	-	-	127	147	80	116	24	12	7	2	3	18	8	20	43	36	643
35	Boreal Chickadee	<i>Poecile hudsonicus</i>	Yellow	-	-	23	16	35	8	4	3	4	3	3	0	3	3	2	3	110
36	Barn Swallow	<i>Hirundo rustica</i>	Yellow	Special Concern	Threatened	0	0	0	12	3	0	0	0	0	0	0	0	0	0	15
37	Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Yellow	-	-	0	0	0	1	0	0	0	0	2	3	10	0	0	0	16
38	Bank Swallow	<i>Riparia riparia</i>	Yellow	Threatened	Threatened	74	11	142	18	0	44	4	13	37	15	7	30	12	2	409
39	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Yellow	-	-	0	2	0	0	0	4	0	0	0	0	0	0	0	6	12
40	Tree Swallow	<i>Tachycineta bicolor</i>	Yellow	-	-	14	25	71	27	49	12	0	0	3	11	1	0	2	1	216
41	Violet-green Swallow	<i>Tachycineta thalassina</i>	Yellow	-	-	6	3	25	4	2	0	0	0	6	2	28	13	32	30	151
42	Ruby-crowned Kinglet	<i>Corthylio calendula</i>	Yellow	-	-	21	89	119	55	11	21	20	23	10	4	16	16	11	17	433
43	Golden-crowned Kinglet	<i>Regulus satrapa</i>	Yellow	-	-	78	26	62	65	0	0	11	12	18	5	2	15	16	16	326
44	Marsh Wren	<i>Cistothorus palustris</i>	Yellow	-	-	5	8	3	0	1	7	0	0	2	3	8	8	0	1	46
45	Rock Wren	<i>Salpinctes obsoletus</i>	Yellow	-	-	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
46	Red-breasted Nuthatch	<i>Sitta canadensis</i>	Yellow	-	-	39	121	296	55	8	24	23	15	30	12	18	32	65	48	786
47	White-breasted Nuthatch	<i>Sitta carolinensis</i>	Yellow	-	-	0	3	4	7	0	0	0	0	0	0	0	0	2	1	17
48	Northern House Wren	<i>Troglodytes aedon</i>	Yellow	-	-	15	53	43	72	9	15	22	2	9	4	5	11	11	11	282
49	Winter Wren	<i>Troglodytes hiemalis</i>	Blue	-	-	14	8	1	7	3	0	0	2	0	0	0	0	0	2	37
50	Pacific Wren	<i>Troglodytes pacificus</i>	Yellow	-	-	0	0	0	15	0	0	0	1	2	0	0	0	0	0	18
51	Brown Creeper	<i>Certhia americana</i>	Yellow	-	-	3	1	2	0	0	0	2	0	1	4	0	0	0	4	17
52	Gray Catbird	<i>Dumetella carolinensis</i>	Yellow	-	-	1	1	0	4	6	16	8	0	7	8	8	17	14	19	109
53	European Starling	<i>Sturnus vulgaris</i>	Exotic	-	-	0	1	0	81	0	0	0	0	0	0	0	0	0	0	82
54	Hermit Thrush	<i>Catharus guttatus</i>	Yellow	-	-	123	157	305	273	69	143	67	28	33	6	20	36	28	21	1309
55	Swainson's Thrush	<i>Catharus ustulatus</i>	Yellow	-	-	366	474	559	290	89	245	138	128	99	126	91	154	126	170	3055
56	Varied Thrush	<i>Ixoreus naevius</i>	Yellow	-	-	0	1	21	56	0	0	1	0	0	0	0	0	0	0	79
57	Townsend's Solitaire	<i>Myadestes townsendi</i>	Yellow	-	-	1	0	5	6	0	2	0	0	1	0	1	0	1	0	17
58	American Robin	<i>Turdus migratorius</i>	Yellow	-	-	166	243	479	403	173	186	90	77	84	90	88	145	129	86	2439
59	House Sparrow	<i>Passer domesticus</i>	Exotic	-	-	0	0	0	19	0	0	0	0	0	0	0	0	0	0	19
60	American Pipit	<i>Anthus rubescens</i>	Yellow	-	-	0	0	0	33	0	0	0	0	0	0	0	0	0	0	33

#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	2006	2008	2011	2012	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<i>Surveys Conducted</i>						478	779	1077	740	275	358	226	143	188	206	204	204	204	202	5284
61	Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Yellow	Special Concern	Special Concern	25	21	11	10	1	0	4	0	0	0	0	0	0	0	72
62	Purple Finch	<i>Haemorhous purpureus</i>	Yellow	-	-	18	17	71	55	3	10	6	1	7	2	19	5	11	10	235
63	Gray-crowned Rosy-Finch	<i>Leucosticte tephrocotis</i>	Yellow	-	-	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
64	Red Crossbill	<i>Loxia curvirostra</i>	Yellow	-	-	7	0	9	9	3	0	0	0	0	0	0	0	0	0	28
65	White-winged Crossbill	<i>Loxia leucoptera</i>	Yellow	-	-	4	32	92	10	0	2	41	3	2	0	1	5	1	28	221
66	Pine Siskin	<i>Spinus pinus</i>	Yellow	-	-	4	29	145	499	27	14	13	1	97	58	30	11	45	12	985
67	Canada Warbler	<i>Cardellina canadensis</i>	Blue	Special Concern	Threatened	106	75	40	30	0	2	5	6	14	20	17	15	15	20	365
68	Wilson's Warbler	<i>Cardellina pusilla</i>	Yellow	-	-	3	10	5	64	9	23	11	14	6	7	0	2	0	2	156
69	Mourning Warbler	<i>Geothlypis philadelphia</i>	Yellow	-	-	30	59	64	36	0	0	6	0	0	4	4	8	7	6	224
70	MacGillivray's Warbler	<i>Geothlypis tolmiei</i>	Yellow	-	-	0	0	10	16	1	6	1	0	7	0	0	0	0	0	41
71	Common Yellowthroat	<i>Geothlypis trichas</i>	Yellow	-	-	66	113	149	22	42	100	18	2	13	43	57	64	61	37	787
72	Orange-crowned Warbler	<i>Leiothlypis celata</i>	Yellow	-	-	102	133	213	139	19	29	21	14	36	32	42	36	48	32	896
73	Tennessee Warbler	<i>Leiothlypis peregrina</i>	Yellow	-	-	139	130	533	185	1	36	4	18	25	14	66	6	10	11	1178
74	Nashville Warbler	<i>Leiothlypis ruficapilla</i>	Yellow	-	-	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
75	Black-and-white Warbler	<i>Mniotilta varia</i>	Yellow	-	-	75	81	107	52	24	34	11	12	23	28	36	28	19	33	563
76	Connecticut Warbler	<i>Oporornis agilis</i>	Blue	-	-	8	20	25	13	10	1	0	0	0	1	0	0	0	0	78
77	Northern Waterthrush	<i>Parkesia noveboracensis</i>	Yellow	-	-	29	47	85	81	24	66	5	0	8	8	12	18	30	25	438
78	Ovenbird	<i>Seiurus aurocapilla</i>	Yellow	-	-	309	489	512	218	43	126	131	107	118	137	136	115	112	160	2713
79	Bay-breasted Warbler	<i>Setophaga castanea</i>	Red	-	-	0	3	1	0	1	2	3	0	0	1	1	0	2	0	14
80	Yellow-rumped Warbler	<i>Setophaga coronata</i>	Yellow	-	-	293	435	731	549	27	89	96	82	84	73	131	95	117	112	2914
81	Magnolia Warbler	<i>Setophaga magnolia</i>	Yellow	-	-	90	69	29	21	14	18	29	10	14	13	20	31	22	35	415
82	Yellow Warbler	<i>Setophaga petechia</i>	Yellow	-	-	344	622	864	550	181	182	136	53	101	142	123	217	208	196	3919
83	American Redstart	<i>Setophaga ruticilla</i>	Yellow	-	-	184	235	249	140	67	109	117	18	31	21	29	54	39	64	1357
84	Blackpoll Warbler	<i>Setophaga striata</i>	Yellow	-	-	4	5	17	12	0	0	0	0	1	1	3	3	1	0	47
85	Cape May Warbler	<i>Setophaga tigrina</i>	Blue	-	-	0	0	5	1	3	7	0	2	1	1	1	0	0	0	21
86	Townsend's Warbler	<i>Setophaga townsendi</i>	Yellow	-	-	1	0	0	58	0	3	0	2	0	0	0	0	0	0	64
87	Black-throated Green Warbler	<i>Setophaga virens</i>	Blue	-	-	159	145	122	60	3	9	14	7	13	14	12	11	6	3	578
88	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Yellow	-	-	45	178	98	113	306	115	16	7	50	87	106	124	109	33	1387
89	Rusty Blackbird	<i>Euphagus carolinus</i>	Blue	Special Concern	Special Concern	2	8	10	0	0	0	0	0	0	0	0	0	0	0	20
90	Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Yellow	-	-	6	45	29	10	11	19	1	0	2	3	2	5	14	0	147

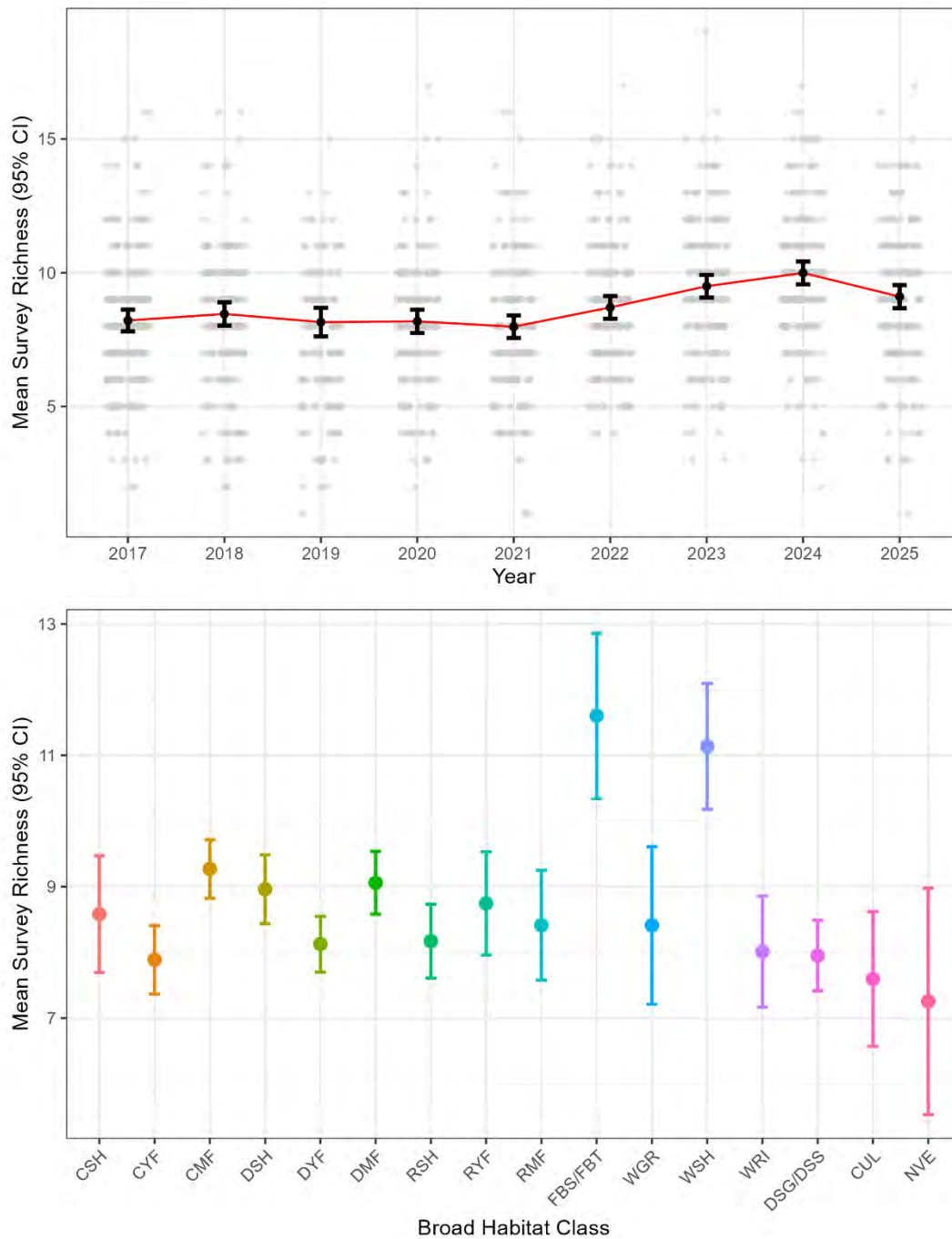
#	English Name	Scientific Name	BC List	COSEWIC	SARA Status	2006	2008	2011	2012	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<i>Surveys Conducted</i>						478	779	1077	740	275	358	226	143	188	206	204	204	204	202	5284
91	Baltimore Oriole	<i>Icterus galbula</i>	Blue	-	-	38	39	39	14	4	6	1	0	18	12	18	12	2	4	207
92	Brown-headed Cowbird	<i>Molothrus ater</i>	Yellow	-	-	59	157	239	244	12	27	9	3	2	16	8	10	22	9	817
93	Common Grackle	<i>Quiscalus quiscula</i>	Yellow	-	-	2	1	6	0	0	0	0	0	0	2	0	0	2	0	13
94	Western Meadowlark	<i>Sturnella neglecta</i>	Yellow	-	-	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
95	LeConte's Sparrow	<i>Ammospiza leconteii</i>	Yellow	-	-	0	3	5	1	0	0	0	0	5	0	0	3	2	0	19
96	Nelson's Sparrow	<i>Ammospiza nelsoni</i>	Red	Not at Risk	-	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
97	Dark-eyed Junco	<i>Junco hyemalis</i>	Yellow	-	-	137	158	196	127	29	47	36	23	27	49	48	63	49	31	1020
98	Swamp Sparrow	<i>Melospiza georgiana</i>	Yellow	-	-	1	17	8	8	44	46	7	3	3	17	21	30	29	3	237
99	Lincoln's Sparrow	<i>Melospiza lincolni</i>	Yellow	-	-	60	242	437	266	73	114	25	15	21	43	45	71	46	14	1472
100	Song Sparrow	<i>Melospiza melodia</i>	Yellow	-	-	31	49	125	33	42	97	45	18	23	45	50	75	107	61	801
101	Savannah Sparrow	<i>Passerculus sandwichensis</i>	Yellow	-	-	2	9	32	104	49	7	2	2	7	2	2	6	14	9	247
102	Fox Sparrow	<i>Passerella iliaca</i>	Yellow	-	-	35	5	44	23	3	0	4	1	0	2	3	0	0	0	120
103	Vesper Sparrow	<i>Poocetes gramineus</i>	Yellow	-	-	4	6	12	66	80	21	12	0	14	13	12	19	7	17	283
104	Clay-colored Sparrow	<i>Spizella pallida</i>	Yellow	-	-	47	97	187	264	119	56	50	2	56	81	81	98	153	79	1370
105	Chipping Sparrow	<i>Spizella passerina</i>	Yellow	-	-	107	212	414	154	14	19	64	36	26	22	22	11	32	26	1159
106	White-throated Sparrow	<i>Zonotrichia albicollis</i>	Yellow	-	-	396	741	942	725	253	348	244	166	259	260	315	372	331	304	5656
107	Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	Yellow	-	-	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
108	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Yellow	-	-	0	1	19	24	0	2	0	1	0	0	3	0	0	0	50
109	Lapland Longspur	<i>Calcarius lapponicus</i>	Yellow	-	-	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
110	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Yellow	-	-	171	183	327	108	34	44	35	20	36	67	46	29	34	21	1155
111	Western Tanager	<i>Piranga ludoviciana</i>	Yellow	-	-	196	245	296	105	32	92	83	71	64	62	43	71	80	69	1509

Figures 6 and 7 present preliminary trends in survey species richness and total detections derived from breeding songbird point count surveys conducted between 2017 and 2025. Values shown represent model-based estimates averaged across survey level covariates and are intended to illustrate broad patterns in high-level community metrics rather than definitive trend outcomes. Overall species richness, averaged across all covariates, was estimated at 8.7 species detections per survey (95% CI 8.4 to 9.0). Overall survey detections, averaged across all covariates, was estimated at 12.6 detections per survey (95% CI 12.1 to 13.0).

Species richness varies among Bird Habitat Classes, with several classes supporting consistently higher values than others (Figure 6). Fen/bog–shrub, Wetland–shrub, and Wetland–graminoid habitats show the highest mean richness. Coniferous–shrub, Coniferous–mature forest, Deciduous–mature forest, and Deciduous–young forest also tend to be at or slightly above the mean across all habitat types (8.7 species per station). In contrast, Riparian–mixed shrub, Riparian–mixed young forest, Riparian–mixed mature forest, Dry slopes–grassland, Dry slopes–shrubland, Cultivated, and Non-vegetated habitats generally support lower species richness relative to the overall average.

Patterns in total detections are similar but more pronounced (Figure 7). Fen/bog–shrub, Wetland–graminoid, and Wetland–shrub habitats support the highest mean detections and are clearly above the mean across all habitat types (12.6 detections per survey). Several forested habitats, including Coniferous–shrub, Coniferous–mature forest, Deciduous–shrub, Deciduous–young forest, and Deciduous–mature forest, are generally near or slightly above the mean across all habitat types. Lower mean detections are observed in Riparian–mixed habitats, Dry slopes–grassland, Dry slopes–shrubland, Cultivated, and Non-vegetated classes.

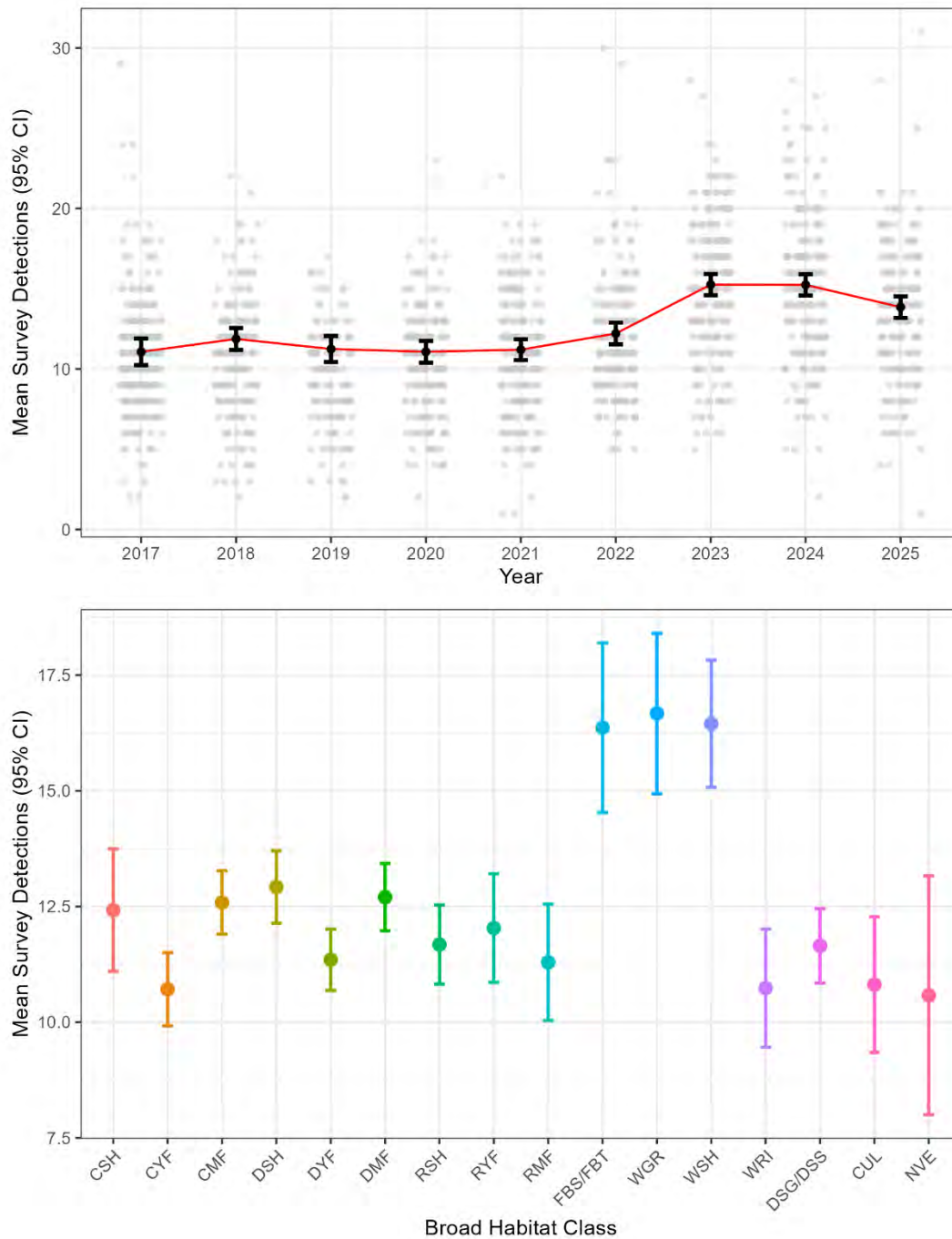
Fen/bog–shrub and Wetland habitats, particularly Wetland–shrub and Wetland–graminoid, are the Bird Habitat Classes that consistently support both higher species richness and higher total abundance relative to other classes.



**Figure 6. Preliminary Trends in Mean Station Species Richness by Year (top) and by Bird Habitat Class (bottom)**

(Top Panel) Light grey dots are species richness values for each survey and displayed to show the distribution of values.

(Bottom Panel) Bird Habitat Classes: CSH - Coniferous-shrub, CYF - Coniferous-young forest, CMF - Coniferous-mature forest, DSH - Deciduous-shrub, DYF - Deciduous-young forest, DMF - Deciduous-mature forest, RSH - Riparian-mixed shrub, RYF - Riparian-mixed young forest, RMF - Riparian-mixed mature forest, FBS - Fen/bog-shrub, FBT - Fen/bog-treed, WGR - Wetland-graminoid, WSH - Wetland-shrub, WRI - Wetland-riparian, DSG - Dry slopes-grassland, DSS - Dry slopes-shrubland, CUL - Cultivated, NVE - Non-vegetated.



**Figure 7. Preliminary Trends in Mean Station Detections by Year (top) and by Bird Habitat Class (bottom)**

(Top Panel) Light grey dots are species richness values for each survey and displayed to show the distribution of values.

(Bottom Panel) Bird Habitat Classes: CSH - Coniferous-shrub, CYF - Coniferous-young forest, CMF - Coniferous-mature forest, DSH - Deciduous-shrub, DYF - Deciduous-young forest, DMF - Deciduous-mature forest, RSH - Riparian-mixed shrub, RYF - Riparian-mixed young forest, RMF - Riparian-mixed mature forest, FBS - Fen/bog-shrub, FBT - Fen/bog-treed, WGR - Wetland-graminoid, WSH - Wetland-shrub, WRI - Wetland-riparian, DSG - Dry slopes-grassland, DSS - Dry slopes-shrubland, CUL - Cultivated, NVE - Non-vegetated.

## 6.0 DISCUSSION

Of the 102 stations surveyed in 2025, 74 stations were a continuation of the semi-permanent stations established in 2020, and 27 new stations were established. The total number of bird species detected in 2025 was similar to previous years with 85 species detected in 2024 and 87 species detected in 2025. In 2024, 74 species were songbirds and in 2025, 68 species were songbirds. The number of species listed under COSEWIC, SARA and/or BC's Red and Blue lists were comparable, with seven listed species detected in 2024 and five listed species detected in 2025. The median number of songbirds detected per point count survey was 10 in 2024 and 9 in 2025. In both years, the most detected bird was White-throated Sparrow (*Zonotrichia leucophrys*) and the second-most detected bird was Red-eyed Vireo (*Vireo olivaceus*). All 68 songbird species detected during the 2025 point count surveys (Table 4) had been previously detected in songbird surveys conducted in prior monitoring years.

Surveys conducted in 2025 represent a continuation in monitoring of semi-permanent monitoring stations that will be monitored through to 10 years post-construction. In future years, some stations may be lost to land use changes or access, and others will be added as needed to address the objective to characterize changes in the bird community of the Peace River Valley over time.

In the preliminary community trend analysis, both survey species richness and total detections show an apparent increasing trend over the period evaluated (Figures 6 & 7). However, these patterns should be interpreted with caution. The observed increases may reflect a range of factors, including changes in local habitat conditions associated with landscape alteration prior to reservoir filling in late 2024, broader regional population trends, or a combination of both. Given the preliminary nature of the analysis and the limited temporal scope evaluated here, it is not possible at this time to attribute observed patterns to specific drivers. More detailed analyses incorporating the full baseline through operations dataset, and explicitly evaluating potential project related and regional influences, will be completed in future reporting.

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# APPENDIX A

## SONGBIRD POINT COUNT STATIONS SURVEYED IN 2025

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**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-007	10	616913	6234543	1	4-Jun-25	06:29	VH	1	0	N	10.0	Dry slopes-grassland
PC25-007	10	616913	6234543	2	20-Jun-25	06:38	AR	4	1	F	10.0	Dry slopes-grassland
PC25-008	10	616553	6234827	1	4-Jun-25	05:55	VH	2	0	N	10.0	Dry slopes-shrubland
PC25-008	10	616553	6234827	2	20-Jun-25	06:14	BR	4	1	F	8.0	Dry slopes-shrubland
PC25-009	10	616192	6234479	1	4-Jun-25	08:41	VH	2	0	N	14.0	Cultivated
PC25-009	10	616192	6234479	2	20-Jun-25	08:43	BR	4	1	F	11.0	Cultivated
PC25-010	10	615902	6234745	1	4-Jun-25	05:20	H	2	0	N	8.0	Dry slopes-shrubland
PC25-010	10	615902	6234745	2	20-Jun-25	05:32	BR	4	1	F	10.0	Dry slopes-shrubland
PC25-011	10	615862	6234301	1	4-Jun-25	09:08	VH	1	1	N	15.0	Cultivated
PC25-011	10	615862	6234301	2	20-Jun-25	09:06	BR	4	1	F	10.0	Cultivated
PC25-019	10	603014	6234339	1	7-Jun-25	08:45	VH	3	1	N	10.0	Dry slopes-grassland
PC25-019	10	603014	6234339	2	25-Jun-25	08:58	VH	3	2	N	10.0	Dry slopes-grassland
PC25-021	10	601274	6234292	1	7-Jun-25	04:19	VH	2	0	N	5.0	Deciduous-shrub
PC25-021	10	601274	6234292	2	25-Jun-25	04:30	VH	3	2	N	11.0	Deciduous-shrub
PC25-024	10	600679	6234123	1	7-Jun-25	04:54	VH	3	1	N	5.0	Deciduous-shrub
PC25-024	10	600679	6234123	2	25-Jun-25	05:07	VH	3	1	N	12.0	Deciduous-shrub
PC25-032	10	594779	6230591	1	7-Jun-25	05:30	VH	3	3	N	5.0	Coniferous-shrub
PC25-032	10	594779	6230591	2	25-Jun-25	08:25	VH	3	1	N	14.0	Coniferous-shrub
PC25-035	10	593385	6229860	1	7-Jun-25	06:07	VH	3	1	N	5.0	Deciduous-shrub
PC25-035	10	593385	6229860	2	25-Jun-25	05:44	VH	3	2	N	12.0	Deciduous-shrub
PC25-038	10	592767	6229065	1	7-Jun-25	07:19	VH	3	1	N	10.0	Dry slopes-shrubland
PC25-038	10	592767	6229065	2	25-Jun-25	07:05	VH	3	0	N	13.0	Dry slopes-shrubland
PC25-039	10	592553	6228662	1	7-Jun-25	08:06	VH	3	1	N	13.0	Cultivated
PC25-039	10	592553	6228662	2	25-Jun-25	07:57	VH	3	2	N	15.0	Cultivated
PC25-040	10	593058	6229341	1	7-Jun-25	06:55	VH	3	1	N	8.0	Dry slopes-shrubland
PC25-040	10	593058	6229341	2	25-Jun-25	06:38	VH	3	2	N	13.0	Dry slopes-shrubland
PC25-050	10	593202	6229554	1	7-Jun-25	06:31	VH	3	0	N	7.0	Dry slopes-shrubland
PC25-050	10	593202	6229554	2	25-Jun-25	06:10	VH	3	0	N	12.0	Dry slopes-shrubland
PC25-069	10	577259	6220860	1	8-Jun-25	06:14	VH	3	0	N	10.0	Dry slopes-shrubland
PC25-069	10	577259	6220860	2	25-Jun-25	06:26	VH	2	2	N	14.0	Dry slopes-shrubland

**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-070	10	576921	6220683	1	8-Jun-25	05:48	VH	2	0	N	9.0	Dry slopes-shrubland
PC25-070	10	576921	6220683	2	25-Jun-25	05:58	VH	2	1	N	14.0	Dry slopes-shrubland
PC25-071	10	576686	6220531	1	8-Jun-25	05:25	VH	3	0	N	8.0	Deciduous-shrub
PC25-071	10	576686	6220531	2	25-Jun-25	05:38	VH	3	1	N	13.0	Deciduous-shrub
PC25-072	10	576256	6220108	1	8-Jun-25	04:51	VH	3	0	N	5.0	Riparian-mixed young forest
PC25-072	10	576256	6220108	2	25-Jun-25	05:07	VH	3	0	N	13.0	Riparian-mixed young forest
PC25-073	10	576001	6219985	1	8-Jun-25	04:30	VH	3	0	N	5.0	Cultivated
PC25-073	10	576001	6219985	2	25-Jun-25	04:45	VH	3	1	N	13.0	Cultivated
PC25-076	10	570355	6212864	1	6-Jun-25	06:02	VH	2	1	N	10.0	Coniferous-young forest
PC25-076	10	570355	6212864	2	23-Jun-25	08:39	VH	2	0	N	11.0	Coniferous-young forest
PC25-077	10	570134	6213209	1	6-Jun-25	06:33	VH	1	1	N	11.0	Coniferous-young forest
PC25-077	10	570134	6213209	2	23-Jun-25	09:06	VH	3	0	N	12.0	Coniferous-young forest
PC25-078	10	565870	6206360	1	6-Jun-25	06:47	VH	2	2	N	12.0	Deciduous-mature forest
PC25-078	10	565870	6206360	2	24-Jun-25	06:22	VH	3	0	N	12.0	Deciduous-mature forest
PC25-080	10	566416	6207084	1	6-Jun-25	04:37	VH	2	1	N	10.0	Deciduous-shrub
PC25-080	10	566416	6207084	2	24-Jun-25	06:58	VH	3	1	N	12.0	Deciduous-shrub
PC25-081	10	566341	6206470	1	6-Jun-25	05:31	VH	3	2	N	12.0	Wetland-shrub
PC25-081	10	566341	6206470	2	24-Jun-25	07:56	VH	3	0	N	12.0	Wetland-shrub
PC25-082	10	564101	6205711	1	6-Jun-25	07:32	VH	2	2	N	12.0	Deciduous-mature forest
PC25-082	10	564101	6205711	2	24-Jun-25	05:29	VH	2	0	N	12.0	Deciduous-mature forest
PC25-084	10	566021	6206826	1	6-Jun-25	05:07	VH	3	2	N	12.0	Deciduous-shrub
PC25-084	10	566021	6206826	2	24-Jun-25	07:32	VH	3	1	N	12.0	Deciduous-shrub
PC25-085	10	563734	6205440	1	6-Jun-25	08:56	VH	2	2	N	14.0	Fen/bog-shrub
PC25-085	10	563734	6205440	2	24-Jun-25	04:18	VH	2	0	N	11.0	Fen/bog-shrub
PC25-086	10	564312	6205213	1	6-Jun-25	08:13	VH	2	2	N	14.0	Deciduous-shrub
PC25-086	10	564312	6205213	2	24-Jun-25	04:51	VH	2	0	N	11.0	Deciduous-shrub
PC25-087	10	565416	6206263	1	6-Jun-25	04:14	VH	2	2	N	10.0	Deciduous-shrub
PC25-087	10	565416	6206263	2	24-Jun-25	06:00	VH	3	0	N	11.0	Deciduous-shrub
PC25-088	10	562713	6205763	1	6-Jun-25	04:29	VH	2	1	N	8.0	Deciduous-mature forest
PC25-088	10	562713	6205763	2	24-Jun-25	04:34	VH	1	0	N	10.0	Deciduous-mature forest

**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-089	10	562800	6206063	1	6-Jun-25	05:07	VH	3	1	N	9.0	Deciduous-mature forest
PC25-089	10	562800	6206063	2	24-Jun-25	05:11	VH	3	0	N	9.0	Deciduous-mature forest
PC25-101	10	566447	6205946	1	6-Jun-25	06:02	VH	2	1	N	12.0	Coniferous-young forest
PC25-101	10	566447	6205946	2	24-Jun-25	08:24	VH	3	1	N	12.0	Coniferous-young forest
PC25-104	10	577541	6220783	1	8-Jun-25	06:42	VH	2	0	N	13.0	Deciduous-young forest
PC25-104	10	577541	6220783	2	25-Jun-25	06:46	VH	2	1	N	14.0	Deciduous-young forest
PC25-201	10	611065	6238042	1	7-Jun-25	04:12	H	4	0	N	8.0	Dry slopes-shrubland
PC25-201	10	611065	6238042	2	23-Jun-25	04:08	VH	2	1	N	9.0	Dry slopes-shrubland
PC25-202	10	611295	6238013	1	7-Jun-25	04:33	H	4	1	N	8.0	Deciduous-young forest
PC25-202	10	611295	6238013	2	23-Jun-25	04:30	VH	2	1	N	9.0	Deciduous-young forest
PC25-203	10	611606	6237736	1	7-Jun-25	05:24	H	2	0	N	8.0	Deciduous-mature forest
PC25-203	10	611606	6237736	2	23-Jun-25	05:24	VH	2	2	N	10.0	Deciduous-mature forest
PC25-204	10	611968	6237681	1	7-Jun-25	05:58	VH	2	0	N	8.0	Deciduous-young forest
PC25-204	10	611968	6237681	2	23-Jun-25	05:52	VH	2	2	N	10.0	Deciduous-young forest
PC25-205	10	612332	6237495	1	7-Jun-25	06:27	VH	1	0	N	8.0	Deciduous-mature forest
PC25-205	10	612332	6237495	2	23-Jun-25	06:20	VH	2	1	N	10.0	Deciduous-mature forest
PC25-206	10	612573	6237329	1	7-Jun-25	07:03	VH	2	1	N	9.0	Wetland-shrub
PC25-206	10	612573	6237329	2	23-Jun-25	06:50	VH	2	2	N	11.0	Wetland-shrub
PC25-207	10	613084	6236953	1	7-Jun-25	08:13	VH	3	1	N	10.0	Wetland-shrub
PC25-207	10	613084	6236953	2	23-Jun-25	07:56	VH	2	2	N	11.0	Wetland-shrub
PC25-208	10	612820	6236955	1	7-Jun-25	07:30	VH	3	1	N	10.0	Deciduous-shrub
PC25-208	10	612820	6236955	2	23-Jun-25	07:19	VH	2	2	N	11.0	Deciduous-shrub
PC25-209	10	613174	6236752	1	7-Jun-25	07:50	VH	2	0	N	10.0	Deciduous-young forest
PC25-209	10	613174	6236752	2	23-Jun-25	07:37	VH	2	2	N	11.0	Deciduous-young forest
PC25-210	10	611575	6237602	1	7-Jun-25	04:54	H	3	0	N	8.0	Wetland-shrub
PC25-210	10	611575	6237602	2	23-Jun-25	04:52	VH	2	1	N	9.0	Wetland-shrub
PC25-500	10	613140	6235203	1	4-Jun-25	05:31	VH	1	0	N	10.0	Deciduous-young forest
PC25-500	10	613140	6235203	2	20-Jun-25	05:35	BR	4	1	N	9.0	Deciduous-young forest
PC25-501	10	612849	6235419	1	4-Jun-25	05:05	VH	2	0	N	9.0	Deciduous-mature forest
PC25-501	10	612849	6235419	2	20-Jun-25	05:06	BR	4	0	N	9.0	Deciduous-mature forest

**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-502	10	612581	6235611	1	4-Jun-25	04:37	VH	1	1	N	8.0	Deciduous-mature forest
PC25-502	10	612581	6235611	2	20-Jun-25	04:40	BR	4	1	N	9.0	Deciduous-mature forest
PC25-701	10	625842	6232609	1	4-Jun-25	09:05	VH	1	0	N	12.0	Deciduous-mature forest
PC25-701	10	625842	6232609	2	20-Jun-25	07:31	H	4	1	N	10.0	Deciduous-mature forest
PC25-702	10	625504	6232756	1	4-Jun-25	08:33	VH	1	0	N	10.0	Deciduous-mature forest
PC25-702	10	625504	6232756	2	20-Jun-25	07:57	AR	4	1	N	12.0	Deciduous-mature forest
PC25-703	10	625158	6232847	1	4-Jun-25	08:10	VH	1	0	N	10.0	Deciduous-mature forest
PC25-703	10	625158	6232847	2	20-Jun-25	08:18	AR	4	1	N	12.0	Deciduous-mature forest
PC25-704	10	624764	6232825	1	4-Jun-25	07:44	VH	1	0	N	10.0	Deciduous-mature forest
PC25-704	10	624764	6232825	2	20-Jun-25	08:46	AR	4	1	N	12.0	Deciduous-mature forest
PC25-705	10	625833	6233704	1	4-Jun-25	07:11	VH	1	0	N	10.0	Dry slopes-grassland
PC25-705	10	625833	6233704	2	20-Jun-25	07:05	AR	4	2	N	10.0	Dry slopes-grassland
PC25-706	10	625519	6233805	1	4-Jun-25	06:45	VH	1	0	N	10.0	Deciduous-young forest
PC25-706	10	625519	6233805	2	20-Jun-25	06:40	AR	4	2	N	10.0	Deciduous-young forest
PC25-707	10	625203	6233851	1	4-Jun-25	06:21	VH	1	1	N	10.0	Dry slopes-shrubland
PC25-707	10	625203	6233851	2	20-Jun-25	06:18	AR	4	2	N	9.0	Dry slopes-shrubland
PC25-708	10	612336	6235964	1	4-Jun-25	04:10	VH	1	0	N	8.0	Deciduous-mature forest
PC25-708	10	612336	6235964	2	20-Jun-25	04:14	BR	4	0	N	9.0	Deciduous-mature forest
PC25-A10	10	599738	6232286	1	3-Jun-25	09:33	VH	4	1	N	12.0	Coniferous-mature forest
PC25-A10	10	599738	6232286	2	21-Jun-25	04:07	VH	3	0	N	9.0	Coniferous-mature forest
PC25-A1A	10	603102	6232795	1	3-Jun-25	04:52	VH	2	0	N	12.0	Coniferous-young forest
PC25-A1A	10	603102	6232795	2	21-Jun-25	04:09	VH	3	0	N	8.0	Coniferous-young forest
PC25-A2A	10	602782	6232778	1	3-Jun-25	05:20	VH	2	0	N	12.0	Coniferous-young forest
PC25-A2A	10	602782	6232778	2	21-Jun-25	04:36	VH	3	0	N	9.0	Coniferous-young forest
PC25-A3A	10	602329	6232884	1	3-Jun-25	05:49	VH	3	0	N	12.0	Deciduous-mature forest
PC25-A3A	10	602329	6232884	2	21-Jun-25	05:07	VH	3	0	N	7.0	Deciduous-mature forest
PC25-A4	10	601952	6232770	1	3-Jun-25	06:25	VH	3	1	N	13.0	Coniferous-mature forest
PC25-A4	10	601952	6232770	2	21-Jun-25	05:54	VH	3	0	N	11.0	Coniferous-mature forest
PC25-A5	10	601607	6232742	1	3-Jun-25	06:57	VH	3	1	N	14.0	Coniferous-mature forest
PC25-A5	10	601607	6232742	2	21-Jun-25	06:29	VH	3	0	N	9.0	Coniferous-mature forest

**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-A6	10	601260	6232688	1	3-Jun-25	07:31	VH	3	0	N	14.0	Coniferous-mature forest
PC25-A6	10	601260	6232688	2	21-Jun-25	06:00	VH	3	0	N	10.0	Coniferous-mature forest
PC25-A7	10	600890	6232601	1	3-Jun-25	08:06	VH	3	1	N	14.0	Coniferous-mature forest
PC25-A7	10	600890	6232601	2	21-Jun-25	05:32	VH	3	0	N	10.0	Coniferous-mature forest
PC25-A8	10	600496	6232512	1	3-Jun-25	08:34	H	3	0	N	14.0	Coniferous-mature forest
PC25-A8	10	600496	6232512	2	21-Jun-25	05:02	VH	2	0	N	10.0	Coniferous-mature forest
PC25-A9	10	600121	6232427	1	3-Jun-25	09:00	VH	3	1	N	14.0	Coniferous-mature forest
PC25-A9	10	600121	6232427	2	21-Jun-25	04:35	H	3	0	N	10.0	Coniferous-mature forest
PC25-B1	10	595349	6229423	1	3-Jun-25	10:00	VH	4	0	N	13.0	Coniferous-young forest
PC25-B1	10	595349	6229423	2	21-Jun-25	07:25	VH	3	0	N	11.0	Coniferous-young forest
PC25-B11	10	593316	6227520	1	3-Jun-25	05:06	VH	4	0	N	12.0	Coniferous-young forest
PC25-B11	10	593316	6227520	2	21-Jun-25	07:50	VH	2	0	N	10.0	Coniferous-young forest
PC25-B12	10	593017	6227306	1	3-Jun-25	04:35	VH	4	0	N	10.0	Coniferous-young forest
PC25-B12	10	593017	6227306	2	21-Jun-25	07:18	VH	2	0	N	10.0	Coniferous-young forest
PC25-B2	10	595098	6229182	1	3-Jun-25	09:35	VH	4	0	N	12.0	Coniferous-mature forest
PC25-B2	10	595098	6229182	2	21-Jun-25	08:02	VH	3	0	N	11.0	Coniferous-mature forest
PC25-B3	10	594882	6228865	1	3-Jun-25	09:06	VH	4	0	N	11.0	Coniferous-young forest
PC25-B3	10	594882	6228865	2	21-Jun-25	08:34	VH	3	0	N	12.0	Coniferous-young forest
PC25-B4	10	594639	6228571	1	3-Jun-25	08:07	VH	4	0	N	13.0	Coniferous-young forest
PC25-B4	10	594639	6228571	2	21-Jun-25	09:09	VH	2	0	N	12.0	Coniferous-young forest
PC25-B5	10	594340	6228348	1	3-Jun-25	07:22	VH	4	0	N	14.0	Deciduous-young forest
PC25-B5	10	594340	6228348	2	21-Jun-25	09:46	VH	2	0	N	12.0	Deciduous-young forest
PC25-B6	10	594087	6228135	1	3-Jun-25	06:49	VH	4	0	N	14.0	Deciduous-young forest
PC25-B6	10	594087	6228135	2	21-Jun-25	09:13	VH	2	0	N	11.0	Deciduous-young forest
PC25-B7	10	593863	6227915	1	3-Jun-25	06:18	VH	4	0	N	13.0	Deciduous-young forest
PC25-B7	10	593863	6227915	2	21-Jun-25	08:50	VH	2	0	N	11.0	Deciduous-young forest
PC25-B8	10	593646	6227692	1	3-Jun-25	05:40	VH	4	0	N	13.0	Coniferous-young forest
PC25-B8	10	593646	6227692	2	21-Jun-25	08:27	VH	2	0	N	10.0	Coniferous-young forest
PC25-C1-2A	10	589075	6225350	1	5-Jun-25	09:10	H	4	0	D	16.0	Coniferous-mature forest
PC25-C1-2A	10	589075	6225350	2	22-Jun-25	04:41	VH	3	0	N	8.0	Coniferous-mature forest

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Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-C1-3	10	588775	6225032	1	5-Jun-25	07:25	VH	3	2	N	15.0	Coniferous-mature forest
PC25-C1-3	10	588775	6225032	2	22-Jun-25	06:28	VH	2	0	N	10.0	Coniferous-mature forest
PC25-C1-4	10	588528	6224817	1	5-Jun-25	06:56	VH	3	2	N	15.0	Coniferous-mature forest
PC25-C1-4	10	588528	6224817	2	22-Jun-25	06:56	VH	2	0	N	10.0	Coniferous-mature forest
PC25-C1-6	10	589376	6225119	1	5-Jun-25	08:37	H	4	1	D	16.0	Coniferous-mature forest
PC25-C1-6	10	589376	6225119	2	22-Jun-25	05:16	VH	2	0	N	9.0	Coniferous-mature forest
PC25-C1-7	10	589102	6224864	1	5-Jun-25	08:00	H	4	2	D	15.0	Coniferous-mature forest
PC25-C1-7	10	589102	6224864	2	22-Jun-25	05:48	VH	2	0	N	9.0	Coniferous-mature forest
PC25-C2-1	10	587264	6223631	1	5-Jun-25	06:45	VH	4	1	N	12.0	Deciduous-young forest
PC25-C2-1	10	587264	6223631	2	22-Jun-25	04:35	VH	3	0	N	8.0	Deciduous-young forest
PC25-C2-2	10	587483	6223815	1	5-Jun-25	07:18	VH	4	1	D	12.0	Deciduous-young forest
PC25-C2-2	10	587483	6223815	2	22-Jun-25	05:26	VH	2	0	N	8.0	Deciduous-young forest
PC25-C2-3	10	587687	6224007	1	5-Jun-25	07:44	VH	4	2	D	12.0	Deciduous-young forest
PC25-C2-3	10	587687	6224007	2	22-Jun-25	05:48	VH	2	0	N	10.0	Deciduous-young forest
PC25-C2-4	10	587990	6224257	1	5-Jun-25	08:14	VH	4	0	D	14.0	Coniferous-young forest
PC25-C2-4	10	587990	6224257	2	22-Jun-25	06:38	VH	1	0	N	10.0	Coniferous-young forest
PC25-C2-5	10	588205	6224535	1	5-Jun-25	08:50	VH	4	2	LR	14.0	Coniferous-mature forest
PC25-C2-5	10	588205	6224535	2	22-Jun-25	07:21	VH	1	0	N	12.0	Coniferous-mature forest
PC25-D1-1	10	574352	6217752	1	5-Jun-25	04:11	VH	1	0	N	9.0	Riparian-mixed young forest
PC25-D1-1	10	574352	6217752	2	23-Jun-25	05:56	VH	1	0	N	10.0	Riparian-mixed young forest
PC25-D1-2	10	574335	6217385	1	5-Jun-25	04:16	VH	1	0	N	12.0	Coniferous-mature forest
PC25-D1-2	10	574335	6217385	2	23-Jun-25	06:20	VH	1	0	N	8.0	Coniferous-mature forest
PC25-D1-3	10	574574	6217605	1	5-Jun-25	04:36	VH	1	1	N	12.0	Coniferous-mature forest
PC25-D1-3	10	574574	6217605	2	23-Jun-25	06:41	VH	1	0	N	11.0	Coniferous-mature forest
PC25-D1-4	10	574823	6217844	1	5-Jun-25	05:07	VH	1	2	N	12.0	Deciduous-mature forest
PC25-D1-4	10	574823	6217844	2	23-Jun-25	07:14	VH	3	0	N	10.0	Deciduous-mature forest
PC25-D1-5	10	575018	6218149	1	5-Jun-25	05:31	VH	2	1	N	12.0	Coniferous-mature forest
PC25-D1-5	10	575018	6218149	2	23-Jun-25	07:40	VH	3	0	N	11.0	Coniferous-mature forest
PC25-D2-4	10	574657	6218563	1	5-Jun-25	05:55	VH	3	1	N	12.0	Deciduous-mature forest
PC25-D2-4	10	574657	6218563	2	23-Jun-25	05:21	VH	1	1	N	7.0	Deciduous-mature forest

**Table A1: Songbird Point Count Stations Surveyed in 2025**

Station	UTM Zone	UTM Easting	UTM Northing	Survey Number	Survey Date	Survey Time	Cloud Ceiling <sup>1</sup>	Cloud Cover <sup>2</sup>	Wind Speed	Precipitation <sup>3</sup>	Temperature (°C)	Bird Habitat Class
PC25-D2-5	10	574463	6218308	1	5-Jun-25	05:15	VH	3	0	N	11.0	Deciduous-mature forest
PC25-D2-5	10	574463	6218308	2	23-Jun-25	04:43	VH	1	0	N	10.0	Deciduous-mature forest
PC25-D2-6	10	573864	6217839	1	5-Jun-25	04:38	VH	3	1	N	10.0	Riparian-mixed shrub
PC25-D2-6	10	573864	6217839	2	23-Jun-25	04:15	VH	1	0	N	8.0	Riparian-mixed shrub
PC25-MF-04	10	563096	6212904	1	6-Jun-25	08:25	VH	2	1	N	14.0	Coniferous-mature forest
PC25-MF-04	10	563096	6212904	2	24-Jun-25	07:39	VH	4	1	N	11.0	Coniferous-mature forest
PC25-MF-05	10	563732	6213761	1	6-Jun-25	09:23	VH	2	2	N	13.0	Deciduous-young forest
PC25-MF-05	10	563732	6213761	2	24-Jun-25	08:17	VH	4	2	N	15.0	Deciduous-young forest
PC25-MF-07	10	562578	6213652	1	6-Jun-25	08:53	VH	2	2	N	15.0	Cultivated
PC25-MF-07	10	562578	6213652	2	24-Jun-25	08:48	VH	3	2	N	12.0	Cultivated
PC25-MF-11	10	563272	6212226	1	6-Jun-25	07:47	VH	2	2	N	12.0	Wetland-graminoid
PC25-MF-12	10	563516	6212341	2	24-Jun-25	06:26	VH	4	1	N	10.0	Fen/bog-shrub
PC25-MF-13	10	563972	6211996	1	6-Jun-25	10:01	VH	3	1	N	16.0	Coniferous-mature forest
PC25-MF-13	10	563972	6211996	2	24-Jun-25	06:57	VH	4	2	N	12.0	Coniferous-mature forest
PC25-WC-07	10	617990	6233853	1	4-Jun-25	07:49	VH	2	0	N	12.0	Dry slopes-grassland
PC25-WC-07	10	617990	6233853	2	20-Jun-25	07:32	BR	4	2	N	8.0	Dry slopes-grassland
PC25-WC-301	10	617550	6233972	1	4-Jun-25	07:15	VH	2	0	N	12.0	Dry slopes-shrubland
PC25-WC-301	10	617550	6233972	2	20-Jun-25	07:57	AR	4	1	F	10.0	Dry slopes-shrubland
PC25-WC-302	10	615643	6235245	1	4-Jun-25	04:50	VH	2	0	N	8.0	Dry slopes-shrubland
PC25-WC-302	10	615643	6235245	2	20-Jun-25	05:03	BTT	4	0	F	8.0	Dry slopes-shrubland
PC25-WC-303	10	615083	6235267	1	4-Jun-25	04:12	VH	1	0	N	6.0	Dry slopes-shrubland
PC25-WC-303	10	615083	6235267	2	20-Jun-25	04:17	BR	4	0	N	9.0	Dry slopes-shrubland

**Table Notes:**

<sup>1</sup> Codes for Cloud Ceiling: Above Tree Tops (ATT), Below Tree Tops (BTT), Above Ridges (AR), Below Ridges (BR), High (H), and Very High (VH)

<sup>2</sup> Codes for Cloud Cover: Clear (1), Scattered Clouds <50% (2), Scattered Clouds >50% (3), and Unbroken Clouds (4)

<sup>3</sup> Codes for Precipitation: No Precipitation (N), Fog (F), Misty Drizzle (M), Drizzle (D), Light Rain (LR)

# APPENDIX B

## PROJECT QUALIFIED ENVIRONMENTAL PROFESSIONALS

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Name and Affiliation	Project Role
Jeff Matheson, M.Sc., R.P.Bio., P.Biol. Tetra Tech Canada Inc.	Project Manager, Report Author
Elyse Hofs, B.Sc., R.P.Bio. Tetra Tech Canada Inc.	Field Data Collection, Data Entry, Report Author
Zoe Osberg, B.Sc., P.Biol. Tetra Tech Canada Inc.	Field Data Collection
Natasha Gidluck, B.Sc., B.I.T. Tetra Tech Canada Inc.	Field Data Collection

# APPENDIX C

## INCIDENTAL OBSERVATIONS OF BIRDS RECORDED DURING POINT COUNTS THAT ARE NOT SONGBIRDS AND BIRDS RECORDED OUTSIDE OF SURVEY PERIODS IN 2025

**Table C.1: Incidental Observations of Non-songbirds Recorded during Point Count Surveys and Songbirds Recorded outside of Survey Periods in 2025, listed in Taxonomic Order**

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Detections
Green-winged Teal	<i>Anas crecca</i>	Yellow	-	-	6
Mallard	<i>Anas platyrhynchos</i>	Yellow	-	-	3
Canada Goose	<i>Branta canadensis</i>	Yellow	-	-	35
Bufflehead	<i>Bucephala albeola</i>	Yellow	-	-	5
Common Goldeneye	<i>Bucephala clangula</i>	Yellow	-	-	1
Trumpeter Swan	<i>Cygnus buccinator</i>	Yellow	Not at Risk	-	6
American Wigeon	<i>Mareca americana</i>	Yellow	-	-	6
Northern Shoveler	<i>Spatula clypeata</i>	Yellow	-	-	6
Blue-winged Teal	<i>Spatula discors</i>	Yellow	-	-	3
Ruffed Grouse	<i>Bonasa umbellus</i>	Yellow	-	-	3
Sora	<i>Porzana carolina</i>	Yellow	-	-	1
Sandhill Crane	<i>Antigone canadensis</i>	Yellow	Not at Risk	-	2
Killdeer	<i>Charadrius vociferus</i>	Blue	-	-	5
Spotted Sandpiper	<i>Actitis macularius</i>	Yellow	-	-	1
Wilson's Snipe	<i>Gallinago delicata</i>	Yellow	-	-	4
Solitary Sandpiper	<i>Tringa solitaria</i>	Yellow	-	-	1
Common Loon	<i>Gavia immer</i>	Yellow	Not at Risk	-	6
Northern Harrier	<i>Circus hudsonius</i>	Yellow	Not at Risk	-	1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Yellow	Not at Risk	-	4
Merlin	<i>Falco columbarius</i>	Yellow	Not at Risk	-	1
American Kestrel	<i>Falco sparverius</i>	Yellow	-	-	1
Western Flycatcher	<i>Empidonax difficilis</i>	Yellow	-	-	1
Common Raven	<i>Corvus corax</i>	Yellow	-	-	1
<b>Total Count:</b>					<b>103</b>

# APPENDIX D

## SEES JV'S LIMITATIONS ON THE USE OF THIS DOCUMENT

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# LIMITATIONS ON USE OF THIS DOCUMENT

## NATURAL SCIENCES

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### 1.5 INFORMATION PROVIDED TO SEES JV BY OTHERS

During the performance of the work and the preparation of this Professional Document, SEES JV may have relied on information provided by third parties other than the Client.

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The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

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SEES JV is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.



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### 1.7 ENVIRONMENTAL ISSUES

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The ability to rely upon and generalize from environmental baseline data is dependent on data collection activities occurring within biologically relevant survey windows.

It is incumbent upon the Client and any Authorized Party, to be knowledgeable of the level of risk that has been incorporated into the project design or scope, in consideration of the level of the environmental baseline information that was reasonably acquired to facilitate completion of the scope.

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### 1.8 NOTIFICATION OF AUTHORITIES

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SEES JV professionals are bound by their ethical commitments to act within the bounds of all pertinent regulations. In certain instances, observations by SEES JV of regulatory contravention may require that regulatory agencies and other persons be informed. The client agrees that notification to such bodies or persons as required may be done by SEES JV in its reasonably exercised discretion.

## **Appendix 2. 2025 Bank Swallow Colony Status Report**

Site C Clean Energy Project  
Assessment of Bank Swallow Colony Status and Habitat Availability of the Site C  
Reservoir Post-inundation

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September 16, 2025

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Figure 4: An example of suitable, but unoccupied habitat formed from erosion. Bands of suitable habitat are interspersed with gravel and cobble dominated substrates. .... 10

Figure 5: New erosion forming potential bank swallow habitat. Between the paleovalley gravel and cobble (lowest, rusty coloured band) and the broken overburden colluvium (chaotic upper band) is a band of substrate suitable for bank swallow burrows (red ellipse). .... 10

## 1. Introduction

Construction of the Site C Clean Energy Project (hereafter the “Project”) began in 2015 and became fully operational in August 2025, resulting in the inundation of 93 km<sup>2</sup> of habitat in the Peace River Valley. Conditions 16.3.3 and 16.3.6 of the 2012 Federal Decision Statement (FDS) for the Project considered the mitigation and monitoring for impacted species at risk, and BC Hydro committed to those mitigations for the unavoidable impacts from the Project. Bank swallow (*Riparia riparia*) were identified by the Vegetation and Wildlife Technical Committee (VWTC) as a species of management consideration due to their reliance on erodible substrates for nesting which are primarily associated with riverine corridors (Environment and Climate Change Canada 2022). While this species may benefit from erosion on reservoir shorelines, existing bank swallow nesting habitat on the inundated reach of the Peace River were vulnerable to being destroyed during reservoir filling. In addition, the Project’s short term and long-term effects on the availability of nesting habitat for bank swallow was identified by VWTC as the primary concern for bank swallow, which is reflected in the Site C Bank Swallow Management Plan (BC Hydro 2023). As such, monitoring efforts to inform the need for mitigation for the Project focussed on documenting baseline habitat, distribution of habitat use, and the inter-annual persistence of nesting habitat following Project completion. Bank swallow became listed as Threatened under Schedule 1 of the *Species at Risk Act* (SARA) in 2017 after Project construction was well underway.

Prior to inundation, baseline surveys of existing bank swallow habitat and distribution upstream of the dam site were conducted in 2019 and 2021. At that time, flows on the Peace River were regulated by outflows from the Peace Canyon dam upstream and by natural tributary inputs. Those surveys quantified colonies and the number of burrows in each colony but did not attempt to determine burrow occupancy. To assess habitat availability post-inundation, bank swallow colonies were marked with sub-10 cm accuracy Global Positioning Satellite (GPS) units to determine whether they were above or below the forecasted reservoir level, and were assigned to one of three broad habitat categories:

- *Low-cutbank* – bank swallow habitat along the edges of watercourses. Erosion highly active.
- *High-cutbank* – bank swallow habitat generally placed in overburden or worked soils at the top of a bank, often below agricultural fields.

- *Eroding slope* – bank swallow habitat in high, steep, exposed sand silt or clay slopes, often characterized by bands of suitable nesting substrate between less suitable substrates.

Of these habitat types, low-cutbank was anticipated to be completely inundated upstream of the dam, while 53% of high-cutbank and 18% of eroding slope habitats were expected to be below the full pool of the operating reservoir (Hemmera Envirochem 2022).

In addition to establishing baseline conditions and predicting habitat vulnerable to direct impacts from reservoir creation, an attempt was made to predict future states of habitat availability. As part of the bank swallow reporting from 2022, terrain and erosion modeling were used to assess the general soil types bank swallow colonies were situated in, and to help project where erosion from reservoir filling may expose suitable substrates for the establishment of new colonies. In that baseline report, mapping of the substrates exposed by the 5-year and 100-year beach lines was used to estimate how bank swallow habitat in the reservoir would evolve over the near term (5-year) and long term (100 year). Rates of erosion vary among substrate type, with those substrates most likely used by bank swallow expected to erode from a minimum of 1 m (sand and gravel) to a maximum of 43 m (overburden colluvium) from the existing shoreline within 5 years (BGC Engineering 2021). Over 100 years, these substrates were predicted to erode from a minimum of 4 m (sand and gravel) to a maximum of 80 m (overburden colluvium). However, as noted in BGC Engineering Inc (2021), these estimates were conservative, and may not reflect the true erosion rates over those periods. Erosion rates are influenced by shoreline material and shoreline geometry. Where less erodible shoreline material (cobbles or bedrock) occurs below these more erodible materials, erosion may not be as pronounced due to armouring from harder material at the reservoir level (pers. comm., Beatrice Collier-Pandya, BGC Engineering Inc., July 9, 2025). The uncertainty in the extent and distribution of erosion made future predictions of habitat suitability for bank swallow difficult.

With a potential for relatively rapid habitat creation for bank swallow nesting following Project completion, but low certainty on the spatial distribution and exact timing, BC Hydro committed to evaluating erosion and bank swallow nesting following the commissioning of the Project's reservoir (BC Hydro 2023). As part of this commitment, BC Hydro entered into a data sharing agreement with the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada (ECCC) where BC Hydro supported CWS-led bank swallow research, and CWS shares data collected during their monitoring efforts. Data from erosion monitoring, conducted by BGC

Engineering Inc., will also assist with understanding how shoreline erosion influences bank swallow nesting habitat in the reservoir. While this collaborative work will support BC Hydro's understanding of the Project effects on bank swallow habitat availability within the reservoir, BC Hydro also identified a need to investigate how erosion in the current breeding season was influencing nest habitat availability, colony occupancy and colony development.

This report details the results of a survey of bank swallow habitat and colony occupancy of the Site C reservoir in June 2025. The goal of this survey was to quantify the number of active colonies within the newly filled Site C reservoir and to identify where suitable habitat is emerging due to erosion. This BC Hydro-led 2025 monitoring allowed for direct before-after contrasts to be made as the lead author was involved in both surveys. This report summarizes BC Hydro's monitoring results from 2025 but does not include information contributed by CWS as those data were not yet available.

## 2. Methods

The goal of this survey was to quantify past (Hemmera Envirochem 2022) and existing bank swallow habitat and to conduct a census of active bank swallow colonies within the Site C reservoir. These objectives were similar to those described in Hemmera Envirochem (2022), and thus the methods are largely the same. A BC Hydro biologist was accompanied by geologists from BGC Engineering Inc. to discuss habitat types important to bank swallow, and how those habitat types might evolve over time.

Survey methodology considered those methods described in Inventory Methods for Swallows and Swifts (Ministry of Environment Lands, and Parks (MOELP) 1998). However, the goal of this survey was not to estimate bank swallow abundance, but to quantify habitat and thus we used line transects to examine all feasibly accessible habitat within the reservoir. A surveyor directed a boat operator to previously active bank swallow colonies that were expected to be above full pool of the reservoir, and investigated new erosion that looked suitable as bank swallow habitat (ECCC 2019, Garrison and Turner 2020). Existing colonies, new colonies and newly exposed substrates were assigned to one of three categories:

- *active colony - new* – new colony with evidence of nesting
- *active colony* – old – pre-existing colony above full pool with evidence of nesting
- *inactive colony - old* – existing colony that did not have evidence of nesting

- *suitable but unoccupied substrate* – newly exposed, suitable substrate and geometry but without evidence of nesting

Each colony, or newly exposed and suitable substrate was recorded using Avenza Maps, with the point placed as close to the actual location as possible. Known colonies that were mapped as being above full pool, but which no longer existed were marked as 'gone'.

The number of burrows at each colony was counted, but the status of each burrow (active or inactive) was not determined. Determining whether an individual burrow was active was not within the scope of this survey.

### 3. Results

The survey of the reservoir was conducted over two days in late June 2025 when nest attendance by birds was expected to be at its peak (Garrison and Turner 2020, Hemmera Envirochem 2022). On June 24<sup>th</sup>, both sides of the reservoir from the Halfway River to the dam site were surveyed. On June 25<sup>th</sup>, the Lynx Creek boat launch was used to survey the section from the Halfway River to just downstream of the Peace Canyon dam. Approximately 183 km of shoreline was surveyed over two days. Notably, due to inundation, it was possible to survey 8 km of the Halfway River; however, 3 km of newly inundated Cache Creek was not surveyed due to unfamiliarity with the status of that section of the reservoir, and the Pine River was not accessible due to the debris boom (Figure 1).

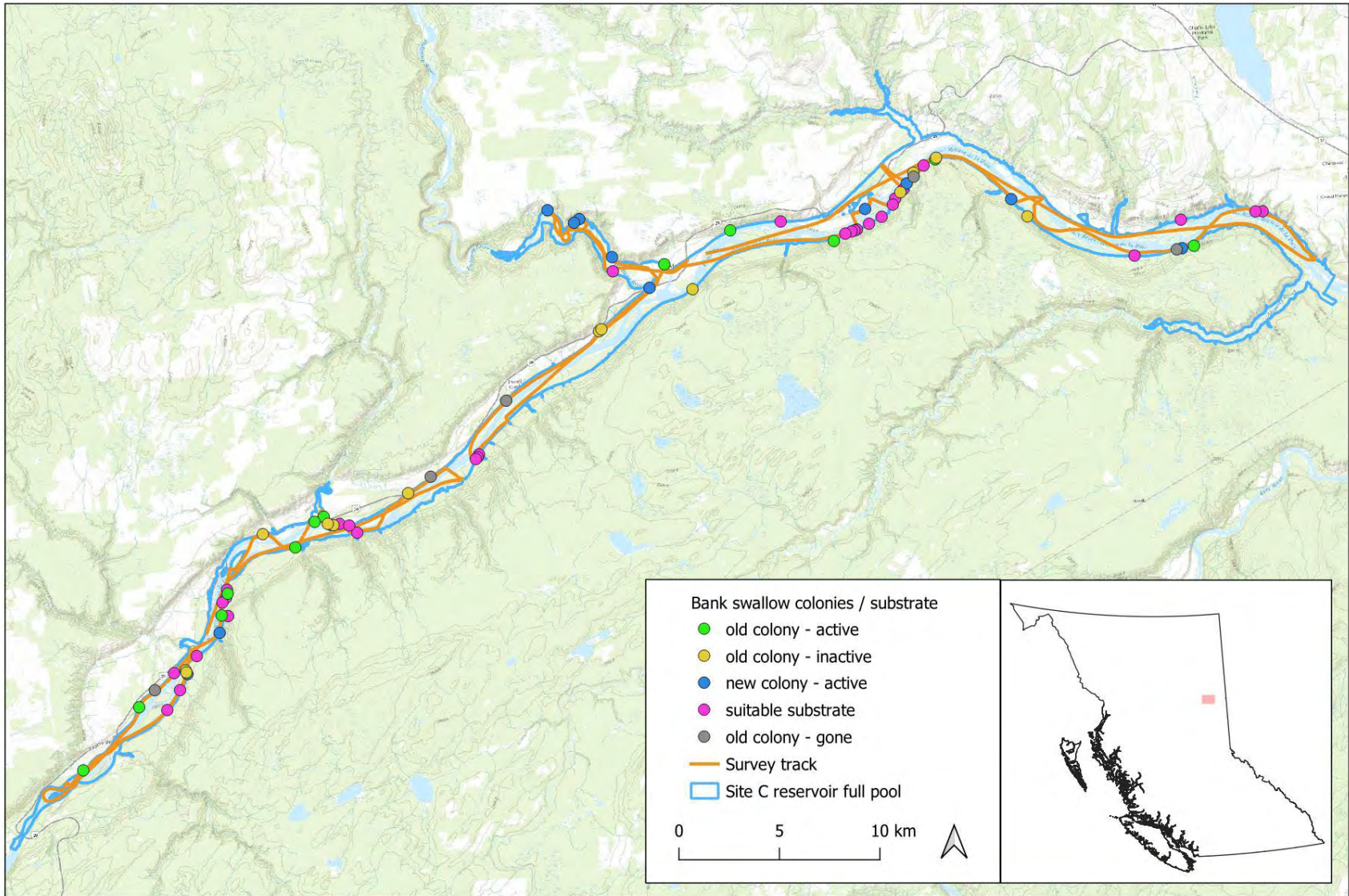


Figure 1: Site C reservoir full pool (blue-outlined polygon) with observed old colonies (green = active, yellow = inactive, gray = missing), new colonies (blue) and areas where exposed substrate is creating suitable bank swallow habitat (pink).

## Colony survey

All 30 previously known colonies predicted to be above full pool were visited. Of these colonies, 12 were determined to be active, 13 had no evidence of use and were deemed inactive, and five were missing either due to erosion or inundation. A total of 12 new colonies were identified in newly exposed substrates (see Figure 2 and Figure 3 for examples). Of these 12, four were in the arm formed by the inundated Halfway River. Total active colonies counted in the Site C reservoir was 24, with an estimated 3,315 burrows within those active colonies (Table 1).

Table 1: Habitat types and status of observed colonies with the estimated number of burrows.

Habitat type	Colony status	Number of colonies	Number of burrows
Eroding slope	new colony - active	8	910
	old colony - active	6	900
	<b>total</b>	<b>14</b>	<b>1,810</b>
High-cutbank	new colony - active	2	90
	old colony - active	6	1,010
	<b>total</b>	<b>8</b>	<b>1,100</b>
Low-cutbank	new colony - active	2	405
	<b>total</b>	<b>2</b>	<b>405</b>
<b>Grand Total</b>		<b>24</b>	<b>3,315</b>

## New colonies and available habitat

New colonies in new erosion were often found in close proximity to existing colonies (Figure 2), but in some cases birds also established new colonies in completely new locations where shoreline erosion has created suitable conditions (Figure 3). New colonies generally had high, vertical faces directly above the shoreline (Figure 2), but two colonies closely resembled low cutbank habitat. In addition to the new colonies, 30 locations were marked as being potential bank swallow habitat due to the presence of erodible soils, and steep slope (Figure 4, Figure 5). These 30 locations identified as potential habitat did not have bank swallows attending them.

Shoreline erosion often forms a head scarp with a near-vertical face of variably suitable substrate (see BGC Engineering 2021). As wasting occurs, erosion moves upslope exposing more substrate. Not all erosion forms suitable habitat, but where suitable substrate is exposed, slope geometry is generally conducive to bank swallow nesting requirements. See Figure 1 for the distribution of colonies throughout the reservoir.



*Figure 2: An existing colony (upper, red ellipse) and new erosion where bank swallows have excavated burrows (lower, red ellipse).*



*Figure 3: New erosion just downstream from Farrell Creek where bank swallows have established a colony in suitable substrate (red ellipse). This image shows how cobble at the new shoreline may armour those more erodible substrates above the shoreline.*



*Figure 4: An example of suitable, but unoccupied habitat formed from erosion. Bands of suitable habitat are interspersed with gravel and cobble dominated substrates.*



*Figure 5: New erosion forming potential bank swallow habitat. Between the paleovalley gravel and cobble (lowest, rusty coloured band) and the broken overburden colluvium (chaotic upper band) is a band of substrate suitable for bank swallow burrows (red ellipse).*

## Loss of colonies due to erosion

Monitoring erosion of bank swallow colonies during the breeding season was not within the scope of this survey, but surveyors did note active erosion and evidence of recent erosion. Determining whether a new colony was lost due to erosion during the breeding season was not possible, but several newly established colonies were on steep faces at the water's edge, exposing them to direct wave action and thus likely increasing the rate of erosion (Figure ).

In addition to the potential loss of new, active colonies, there were locations where colonies were originally established high above the Peace River (in high-cutbank or eroding slope habitat), but since inundation they now are seeing active erosion of the bases of those slopes (Figure ). Continued undermining of these colonies may result in loss of the face of the original colony.



*Figure 6: Erosion at the base of an existing colony (red ellipse) in high, eroding slope habitat. Pre-inundation, this colony was well above the reservoir and erosion events were likely less common. Since inundation, the base of this high slope is now underwater, and shoreline erosion is actively removing the supporting material of this colony.*



*Figure 7: burrows established in potentially active erosion, risking the fate of those nests (red ellipse).*

## 4. Discussion

The Project impounded approximately 83 km of the Peace River, from the Peace Canyon Dam, near Hudson's Hope, BC, to the confluence of the Peace River and the Pine River. Inundation eliminated the erosional processes associated with a riverine, hydrological processes, and with that, conditions that benefitted a substantial number of bank swallow colonies along this section of river (Hemmera Envirochem 2022). In accordance with conditions of the FDS for the Project, BC Hydro committed to mitigating the effects of the Project on bank swallow. The primary effect of the Project on bank swallow is the direct loss of nesting substrates below full pool in the short term, and the unknown outcome of shoreline erosion in the long term. While direct losses of habitat are easily quantifiable, the long-term patterns of erosion, and thus habitat supply, are difficult to predict (BGC Engineering 2021). This survey quantified suitable nesting substrates that are becoming available, identified new colonies in new erosion and surveyed existing colonies which were known to be above the full pool mark of the Site C reservoir.

### Existing and new colonies

The total number of colonies and estimated number of burrows found in 2025 was similar to the number found during the survey in 2021. In 2021, 20 colonies were identified upstream of the dam, with a total of 3,301 burrows counted. In 2025, 20 colonies were identified within the main

body of the Site C reservoir, with four additional colonies identified in the arm formed by the inundated, and previously unsurveyed Halfway River. Considering only those 2025 colonies within the same surveyed area as 2021, there were fewer total burrows – 2,885. The difference of 416 fewer burrows counted in 2025 as compared to 2021 may indicate fewer, new burrows established post-inundation, but given the difficulty of accurately counting burrows, and a focus on habitat assessment, rather than the breeding population, much of this difference could be attributed to measurement error. However, fewer total burrows in 2025 would be unsurprising, given the inundation of most of the existing colonies and suitable habitat, and the active erosion which may have removed new colonies and burrows prior to our survey. While enumerating active burrows and monitoring nest success were outside the scope of this survey, the similar number of colonies as found before inundation suggests that the total population of bank swallows nesting within the reservoir is similar to 2021.

#### Erosion and habitat supply

Assessing the rate of erosion, and whether suitable bank swallow nesting substrates will be exposed in the long term is beyond the scope of this document. Long-term erosion monitoring is being conducted by BGC Engineering Inc using sensors installed throughout the reservoir, and through change detection using LiDAR data (Beatrice Collier-Pandya, BGC Engineering Inc., June 24, 2025). In this survey we examined erosion where it was currently happening and assessed whether the exposed substrate was suitable as bank swallow nesting habitat. We identified 30 locations that appeared suitable but did not have evidence of nesting. There are several possible explanations for this lack of occupancy of seemingly suitable habitat – 1) bank swallows are not habitat-limited in the Peace River Valley; 2) colonies may have been established but subsequently lost due to frequent erosion events; 3) habitat we identified as suitable is not suitable. Of these, the first is the most likely given that during the survey in 2021 and 2025 not all existing colonies were active. Bank swallow are known to re-use colony sites, but occupancy of colonies ranges from 55-92% year to year (Falconer 2016, ECCC 2019). The similar number of colonies and burrows in 2025 compared to 2021, and establishment of new colonies in new erosion suggests that more habitat may be available in 2025 than is required to sustain nesting efforts. Whether erosion continues to produce suitable habitat over the long term is unknown.

## 5. Conclusion

The survey conducted in 2025 resulted in nearly the same number of colonies and burrows as the survey conducted in 2021, prior to inundation. Of the colonies identified on the 2021 survey as being above the projected full pool of the reservoir, 12 were active, 12 appeared to be inactive and five were not found. We found 12 new colonies in newly eroded substrate, often near existing colonies. In addition to colonies, we identified 30 locations which appeared suitable, but which were not currently active as bank swallow colonies.

These results indicate that bank swallow have successfully established nests in existing colonies and established new colonies in new erosion in the newly inundated Site C reservoir. Nest outcomes are unknown, but the number of burrows within active colonies suggests that the number of breeding pairs of bank swallow in the Site C reservoir may not be substantially smaller than in 2021, prior to inundation.

The long-term outcome of erosion is unknown, but evidence from the Dinosaur and Williston Reservoirs suggests suitable bank swallow habitat can persist in these regulated waterbodies (Harry van Oort, pers. comm., BC Hydro, June 13, 2025). If suitable substrate, with appropriate slope geometry continues to be exposed, bank swallow will likely not be habitat limited in the Site C reservoir in the future.

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## **Appendix 3. 2025 Bank Swallow Monitoring Memo Area A**

<b>To:</b>	Brent Matsuda, BC Hydro	<b>Date:</b>	March 24, 2026
<b>From:</b>	Elyse Hofs, Jeff Matheson	<b>Memo No.:</b>	001
<b>Subject:</b>	Site C 2025 Bank Swallow Survey Memo		

## 1.0 INTRODUCTION

Saulteau EBA Environmental Joint Venture (SEES JV) completed surveys for Bank Swallow (*Riparia riparia*) at British Columbia Hydro and Power Authority’s (BC Hydro) Site C Clean Energy Project (“Site C”) in the summer of 2025. The purpose of the surveys were to determine the presence and breeding status of Bank Swallow (BKSJ) at two locations within an area of the construction site referred to as Area A.

BKSJ are federally designated as ‘threatened’ under the *Species at Risk Act* (SARA) and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Within British Columbia, BKSJ are yellow-listed (i.e., secure and not at risk of extinction).

## 2.0 SURVEY SITES

In 2025, BKSJ surveys were conducted at two sites within Area A (Table 2-1; Figure 1). This was the second year of monitoring for Colony 4, which was discovered on site by BC Hydro staff in spring of 2024. This was the fifth year of monitoring for Colony 5 (referred to as “Batch Plant” or “Area A” in memos from previous years<sup>1,2</sup>).

**Table 2-1: 2025 Area A Bank Swallow Survey Sites**

Survey Site	UTM Coordinates	Elevation (metres above sea level)
Colony 4	10 V 630729 m E 6227692 m N	477 m
Colony 5 (Batch Plant)	10 V 630607 m E 6227669 m N	478 m

Monitoring for BKSJ Colony 1, Colony 2, and Colony 3, which were first discovered in 2024, did not continue in 2025. These three colonies had been located in sand stockpiles which no longer exist in Area A.

### 2.1 Colony 4

Colony 4 was on the southeastern edge of the aggregate storage area located east of the batch plant on the south bank of the construction site on a 50 m long, near-vertical, west-facing slope on the face of an old soil stockpile (Figure 1). This colony was situated on the east bank of the drainage ditch that surrounds the perimeter of the aggregate storage area which is assumed to be outside of the active work area.

<sup>1</sup> Tetra Tech. 2023. Site C 2023 Bank Swallow Survey Memo – Revised. Consultants report prepared for BC Hydro dated March 6, 2024.

<sup>2</sup> Tetra Tech. 2022. Site C 2022 Bank Swallow Survey Memo. Consultants report prepared for BC Hydro dated November 17, 2022.

This year (2025) was the second year of monitoring at this site. BC Hydro environmental staff had located the colony in June 2024 and the Colony was confirmed to be active during the 2024 BKSWS monitoring program. In 2025, it was noted that natural slumping has degraded the vertical faces of the slope since June 2024, along with many of the BKSWS cavities previously present along the slope (Photo 1 & 2).

## 2.2 Colony 5 (Batch Plant)

Colony 5 (referred to as the “Batch Plant” or “Area A” monitoring site in previous memos<sup>1,2</sup>) was a temporary habitat compensation site established in 2021 that has now undergone five years of monitoring for BKSWS. Colony 5 was located on the south bank of the Site C construction site, between Septimus Road to the south and an aggregate storage area to the north (Figure 1). The BKSWS cavities were located along a previously excavated pit face / slope that follows the alignment of Septimus Road. The slope face was approximately 190 m long and faces to the north/northeast (Photos 3 to 5). The soils along the slope appeared to be stable and the slope faces were near vertical (>75°).

## 3.0 SURVEY METHODS

Survey methodology was adapted from the Resource Inventory Standards Committee (RISC) *Inventory Methods for Swallows and Swifts*<sup>3</sup>. Standwatch surveys were conducted at the two survey sites twice during June of 2025. During each standwatch survey, the surveyor observed the potential nesting site for 30 minutes to record BKSWS entering and exiting the nest cavity sites. The 30-minute observation period was considered to be a sufficient duration to establish BKSWS activity at each colony. As per the RISC protocol, surveys were conducted after 10 a.m. (when insect prey are more likely to be active), and always under clear weather conditions (i.e., no surveys were conducted in rain or inclement weather).

## 4.0 SURVEY RESULTS

Colony 4 and Colony 5 were surveyed for BKSWS activity on June 20 and 23, 2025.

### 4.1 Colony 4

BKSWS nesting activity was not observed at the Colony 4 survey site during either visit (Table 4-1; Photos 1 & 2). Thirty-five BKSWS cavities were counted in Colony 4, and none of the cavities were confirmed to be active. Natural degradation of the unstable slope has resulted in the loss of approximately 65% of the 100 BKSWS cavities counted in 2024.

<sup>3</sup> Resources Information Standards Committee (RISC). 1998. *Inventory Methods for Swallows and Swifts, Standards for Components of British Columbia's Biodiversity No. 16*. Province of British Columbia. 32 pp.

**Table 4-1: Survey Results for the 2025 Bank Swallow Surveys at Colony 4**

Observation Date/Time	Observer(s)	Observations
June 20, 2025 12:43 – 13:13	Elyse Hofs & Zoe Osberg	<ul style="list-style-type: none"> <li>35 BKSWS cavities were located on a 50 m long, west-facing slope of a soil stockpile.</li> <li>The vertical faces of the slope have degraded since June 2024, along with many of the BKSWS cavities previously present along the slope.</li> <li>No BKSWS were observed entering or exiting cavities during the survey.</li> <li>By the end of the survey no active cavities had been confirmed.</li> </ul>
June 23, 2025 13:24 – 13:54	Elyse Hofs & Zoe Osberg	<ul style="list-style-type: none"> <li>No BKSWS were observed entering or exiting cavities during the survey.</li> <li>By the end of the survey no active cavities had been confirmed.</li> </ul>

## 4.2 Colony 5 (Batch Plant)

BKSWS nesting activity was observed at Colony 5 (Batch Plant) during both visits (Table 4-2; Photos 3 & 4). One hundred and twenty-two BKSWS cavities were counted at Colony 5 with at least fifteen cavities confirmed to be active.

**Table 4-2: Survey Results for the 2025 Bank Swallow Surveys at Colony 5 (Batch Plant)**

Observation Date/Time	Observer(s)	Observations
June 20, 2025 12:32 – 13:02	Elyse Hofs & Zoe Osberg	<ul style="list-style-type: none"> <li>122 BKSWS cavities are located on a 190 m long, north/northeast-facing slope, with most cavities present on the west side of the slope.</li> <li>BKSWS were observed entering and exiting cavities throughout the survey.</li> <li>Between 25 - 30 BKSWS individuals were observed flying above Colony 5 throughout survey.</li> <li>By the end of the survey twelve cavities were confirmed to be active. The majority of active cavities were centrally located along the slope.</li> </ul>
June 23, 2025 13:08 – 13:38	Elyse Hofs & Zoe Osberg	<ul style="list-style-type: none"> <li>BKSWS were observed entering and exiting cavities throughout the survey.</li> <li>Overall, less BKSWS activity than on June 20. Up to 10 BKSWS individuals were observed flying above Colony 5 at any one time throughout the survey.</li> <li>By the end of the survey, 15 cavities were confirmed to be active. The majority of active cavities were centrally located along the slope.</li> </ul>

## 5.0 DISCUSSION

The 2025 BKSWS monitoring conducted in Area A confirmed BKSWS breeding activity at Colony 5. Of the 122 cavities present along the slope, surveys indicated that up to 15 cavities (12.3%) were active in 2025. This is similar to the 2024 monitoring year, where 13 out of 133 BKSWS cavities were estimated to have been active at Colony 5.

No evidence of BKSWS breeding activity was observed at Colony 4 on either of the two visits conducted during the 2025 BKSWS monitoring year and only 35 BKSWS cavities were counted on the slope. During the 2024 monitoring year, 100 BKSWS cavities were counted in Colony 4 and nine BKSWS cavities were confirmed to be active. Approximately 65% of the BKSWS cavities present in June 2024 were either destroyed or buried by degradation of the vertical slope face over the subsequent year. The lack of active BKSWS cavities in Colony 4 indicates that this slope is no longer preferred for BKSWS nesting, likely because the slope has become unstable.

## 6.0 LIMITATIONS OF REPORT

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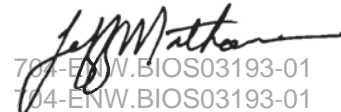
## 7.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,  
Tetra Tech Canada Inc.



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Attachments: Figures (1)  
Photos (5)  
Appendix A: Tetra Tech's Limitations on the Use of this Document

## FIGURE

Figure 1      2025 Area A Bank Swallow Survey Sites



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**LEGEND**

Slope Face

**NOTES**  
 Base data source:  
 Imagery from BC Hydro (Main Map: May 2025 / Overview: Sept 2023).



**STATUS**  
 ISSUED FOR USE

**SITE C**  
**2025 BANK SWALLOW SURVEY MEMO**

**2025 Area A Bank Swallow Survey Sites**

<b>PROJECTION</b> UTM Zone 10	<b>DATUM</b> NAD83				
Scale: 1:2,000 Metres					
<b>FILE NO.</b> BIOS03193-01_Fig01_AreaA.mxd					
<b>OFFICE</b> Tl-VANC	<table border="1"> <tr> <td><b>DWN</b> SL</td> <td><b>CKD</b> MRB</td> <td><b>APVD</b> EH</td> <td><b>REV</b> 0</td> </tr> </table>	<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> EH	<b>REV</b> 0
<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> EH	<b>REV</b> 0		
<b>DATE</b> December 5, 2025	<b>PROJECT NO.</b> ENW.BIOS03193-01				

**CLIENT**

**Figure 1**

## PHOTOS

- Photo 1. Colony 4 located on a west-facing slope of a sand stockpile on June 20, 2025.
- Photo 2. Close-up view of a section of Colony 4 on June 20, 2025.
- Photo 3. Colony 5 (Batch Plant) located on a north/northeast-facing slope. Photo shows the view of Colony 5 from the eastern end of the slope on June 20, 2025.
- Photo 4. View of Colony 5 (Batch Plant) from the western end of the slope on June 20, 2025.
- Photo 5. Close-up view of a section of Colony 5 (Batch Plant) through binoculars on June 20, 2025.



**Photo 1:** Colony 4 located on a west-facing slope of a sand stockpile on June 20, 2025.



**Photo 2:** Close-up view of a section of Colony 4 on June 20, 2025.



**Photo 3:** Colony 5 (Batch Plant) located on a north/northeast-facing slope. Photo shows the view of Colony 5 from the eastern end of the slope on June 20, 2025.



**Photo 4:** View of Colony 5 (Batch Plant) from the western end of the slope on June 20, 2025.



**Photo 5:** Close-up view of a section of Colony 5 (Batch Plant) through binoculars on June 20, 2025.

## APPENDIX A

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# LIMITATIONS ON USE OF THIS DOCUMENT

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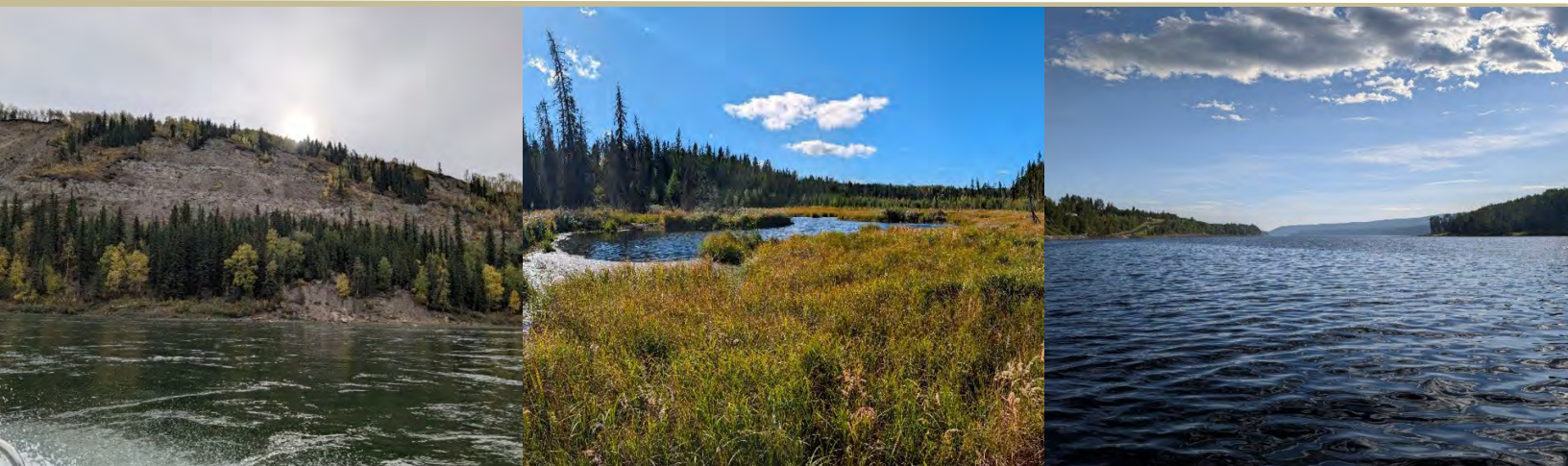
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## **Appendix 4. 2025 Waterbird Monitoring Report**



# Site C Clean Energy Project Waterbird Migration Monitoring Program 2025 Annual Report



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MARCH 30, 2026  
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Saulteau EBA Environmental Services Joint Venture  
Suite 1000 – 10th Floor, 885 Dunsmuir Street  
Vancouver, BC V6C 1N5 CANADA  
Tel 604.685.0275 Fax 604.684.6241

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# Site C Clean Energy Project Waterbird Migration Monitoring Program 2025 Annual Report

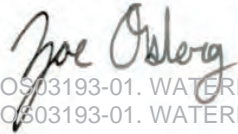
FILE: 704-ENW.BIOS03193-01.WATERBIRDS25  
March 30, 2026

## PRESENTED TO

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**Site C Clean Energy Project  
British Columbia Hydro and Power Authority**  
Brent Matsuda  
333 Dunsmuir Street, 6<sup>th</sup> Floor  
Vancouver, BC V6B 5R3  
P: 604-968-8206

Prepared by:



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FILE: 704-ENW.BIOS03193-01. WATERBIRDS 25

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## EXECUTIVE SUMMARY

In 2025, British Columbia Hydro and Power Authority (BC Hydro) contracted Saulteau EBA Environmental Services Joint Venture (SEES JV) to conduct surveys as part their Waterbird Migration Monitoring Program for the Site C Clean Energy Project (the Project). The objectives of the program are to document changes in waterbird habitat, abundance, and diversity within wetland and non-wetland habitats during Project construction and the first ten years of operations. 2025 is the first full year of waterbird surveys conducted post-reservoir filling.

The monitoring involves two study areas: a 146.5 kilometre (km) long stretch of the Peace River (between Hudson's Hope and the Alberta border); and wetlands within the Moberly Plateau that occur within 3 km of the transmission line right-of-way. Each study area was surveyed five times (known as "survey rounds") within the spring (April 1 to May 30) and fall (August 1 to October 15) waterbird migration periods. Qualified Environmental Professionals conducted boat surveys on the Peace River in three treatment areas – the inundation impact area upstream of the dam site, the flow regime impact area downstream of the dam site to Taylor, B.C., and the control area from Taylor to the Alberta border. Standwatch and ground-transect surveys were conducted in the transmission line study area. Standwatch surveys were conducted in habitats with open water, and 100 metre transect surveys were conducted in sedge and willow-sedge habitats. Autonomous Recording Units (ARUs) were deployed in ten wetlands to capture vocalizations from four crepuscular and nocturnal species: American Bittern (*Botaurus lentiginosus*), Sora (*Porzana carolina*), Yellow Rail (*Coturnicops noveboracensis*), and Virginia Rail (*Rallus limicola*).

Waterbird observations were analyzed and presented using the following metrics: species richness, species evenness, total abundance, and density. Mean densities of waterbirds on the Peace River were summarized by river habitat type and treatment area. For the transmission line, species richness and total abundance were also summarized by survey type and wetland station. ARU analysis used a combination of bird sound recognition tools Kaleidoscope Pro and BirdNET Analyzer to analyze recording files for the presence of the four crepuscular/nocturnal species.

An overview of the results from the 2025 Waterbird Migration Monitoring Program are as follows:

- A total of 22 wetlands were surveyed, with a total of 187 wetland surveys (standwatches and transects) conducted in the transmission line.
- Peace River boat surveys detected 26 species across all survey periods (excluding unknown birds).
- Standwatch and transect surveys detected 34 species (excluding unknown birds). Standwatch surveys consistently detected more species (13 – 24 species) compared to transect surveys (0 – 7 species).
- Transect surveys detected fewer species in 2025 (0 – 7 species) than the previous year (1 – 12 species).
- The reservoir had the highest total abundance of waterbirds out of the Peace River habitat types, and the inundation impact area had the highest total abundance of waterbirds out of the Peace River treatment areas.
- The mainstem had the highest total abundance of waterbirds within the control area habitat types, but the limited connectivity habitat had the highest mean density.
- For boat surveys, large dabblers had the highest total abundance out of all the foraging guilds. Of these large dabblers, most consisted of Canada Goose (*Branta canadensis*).
- For standwatch surveys, dabbling ducks contributed to the highest mean densities in every survey round except for early fall, when shorebirds had slightly greater mean density. For transect surveys, the mean density of large dabblers, shorebirds, and marsh birds was equal in late spring, but marsh birds had the highest mean density in late spring.
- Mean density was 0 for all fall transect surveys as no waterbirds were detected in any transmission line wetlands.
- All nine wetlands where ARUs were deployed and recovered had positive detections of Sora, and one wetland had positive detections of Virginia Rail. American Bittern and Yellow Rail were not detected in any of the wetlands.

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## APPENDICES

- Appendix A     Saulteau EBA Environmental Services Joint Venture’s Limitations on the Use of this Document
- Appendix B     Peace River Digital Data Collection Field Form (Survey123)
- Appendix C     Transmission Line Wetlands Digital Data Collection Field Form (Survey123)
- Appendix D     Waterbird Species List, Foraging Guild, and Total Abundance in 2025
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## 1.0 INTRODUCTION

British Columbia Hydro and Power Authority (BC Hydro) is assessing the effects of the Site C Clean Energy Project (the Project) on waterbirds as per the conditions outlined in the provincial Environmental Assessment Certificate (EAC) # E14-02 (Environmental Assessment Office 2014) and Federal Decision Statement (FDS; BC Hydro 2014).

BC Hydro is assessing the effects of the Project on shorebirds, marsh birds, and waterfowl using methods in Version 6 of the *Site C Vegetation and Wildlife: Waterbird Migration Follow-up Monitoring Program* (hereafter known as the “Program Plan”) (BC Hydro 2022). The primary objectives of the Program Plan are to document changes in waterbird habitat, abundance, and diversity within wetland and non-wetland habitats (i.e., on the Peace River and within the wetlands adjacent to the transmission line ROW), during Project construction and the first ten years of Project operations (BC Hydro 2022). Specifically, the objectives of the Program Plan for waterbirds are to:

1. Evaluate changes in wetland and non-wetland habitat to assess the Project-related impacts outlined in the EAC;
2. Analyze and report changes in waterbird abundance across Peace River and Moberly Plateau wetland habitats to assess Project-related impacts outlined in the EAC; and
3. Monitor the use of both manmade and natural wetland habitat by waterbirds to assess the effectiveness of Project mitigation measures.

BC Hydro retained Saulteau EBA Environmental Services Joint Venture (SEES JV) to complete the 2025 Waterbird Migration Monitoring Program within areas of the Peace River (from Hudson’s Hope to the Alberta border) and wetlands in Moberly Plateau near the transmission line right-of-way (ROW) (Figure 1), in the context of waterbird disturbance, displacement, mortality, and habitat alteration and fragmentation.

On August 26, 2024, the Site C reservoir began filling, marking a change from the construction phase to the Operations phase. The reservoir completed filling on November 7<sup>th</sup>, 2025. All surveys completed in 2025 were after the reservoir filling period.

### 1.1 Regulatory Context

The Waterbird Migration Monitoring Program for the Site C Clean Energy Project is a requirement of both provincial and federal regulatory approvals issued for the Project. Monitoring is undertaken to meet EAC Condition 21 which requires BC Hydro to implement a Qualified Environmental Professional-led Vegetation and Wildlife Mitigation and Monitoring Plan to verify the effectiveness of measures to manage Project effects on wildlife, including monitoring of waterfowl and shorebird populations and their use of natural, created, and artificial wetlands. At the federal level, the program addresses FDS Conditions 10 and 11 which require monitoring of migratory bird abundance, distribution, habitat use, and the effectiveness of mitigation and compensation measures in both wetland and non-wetland habitats affected by the Project. Additional requirements are established through Conditional Water Licences issued by the Comptroller of Water Rights, under which waterbirds are included as part of the Breeding and Migratory Birds program area subject to review by the Vegetation and Wildlife Technical Committee.

### 1.2 Waterbirds Group

The Program Plan defines a “waterbird” as a species of bird belonging to one of the following taxonomic orders:

- Anseriformes (ducks, geese, and swans)

- Gaviiformes (loons)
- Podicipediformes (grebes)
- Charadriiformes (avocets, gulls, phalaropes, plovers, sandpipers, snipes, and terns)
- Gruiformes (cranes, herons, and rails)
- Pelecaniformes (bitterns and pelicans)

The waterbird species observed correspond to eight different groups, which are based on habitat types, body characteristics, and dietary preferences, hereafter known as “foraging guilds” to remain consistent with the Program Plan:

- Benthic-feeding divers (species that forage by diving and feed on benthic aquatic vegetation or invertebrates)
- Piscivorous divers (species that dive and primarily consume fish)
- Dabbling ducks (species that dabble and dip their head and neck below the water to forage for either plants, insects, or invertebrates)
- Large dabblers (larger-bodied dabbling species, e.g., swans and geese)
- Cranes and herons
- Shorebirds
- Gulls and surface-feeding terns
- Marsh birds

## 2.0 METHODS

The Waterbird Migration Monitoring Program involves two key study areas: the 146.5 kilometre (km) long stretch of the Peace River (between Hudson’s Hope and the Alberta border) and a select group of wetlands within the Moberly Plateau that occur within 3 km of the transmission line ROW (Figure 1).

Surveys were conducted based on methods outlined in the Program Plan for the Waterbird Migration Monitoring Program (BC Hydro 2022). These methods are consistent with previous Waterbird Migration Monitoring conducted by Ausenco from 2017 – 2023 and included the same Peace River survey area and wetlands in the Moberly Plateau. Peace River boat surveys routes and Moberly Plateau transmission line survey locations were conducted as close as possible to routes and locations from previous years.

Waterbird surveys may take place at any time during daylight hours but require a consistent time between rounds (Resources Inventory Committee 1999), as such, surveys were typically conducted between 7:00 am and 2:00 pm. Breaks were taken as required due to inclement and/or weather or reduced visibility (e.g., thick fog, whitecaps, thunderstorms). Suitable weather consisted of winds less than or equal to 3 on the Beaufort scale, no precipitation or very light drizzle, and clear visibility (absence of smoke or fog).

Each survey was recorded using ESRI’s ArcGIS Survey123 digital data collection application. Appendix B and Appendix C lists the data collection variables used for the boat and wetland surveys, respectively. Basic details (e.g., date, time, surveyors) were recorded once per survey and weather details were recorded at the start and end of each survey. Each waterbird observation was recorded, including the species, number of individuals, associated habitat, water depth, primary behaviour, detection type, and distance from the observer.

## 2.1 Waterbird Survey Frequency and Timing

The following terms are used to describe the timings of waterbird surveys throughout this report:

- Survey period: the season in which surveys are taking place, either spring or fall.
- Survey round: a group of days (e.g., August 2-3), consisting of a complete set of Peace River or transmission line surveys.
- Survey day: a single day of surveys (e.g., August 2, 2025) for either the Peace River or transmission line.

Each monitoring year, five rounds of Peace River surveys and transmission line wetland surveys are conducted. Two rounds are completed during the spring migration survey period (April 1 to May 30), and three rounds are completed in the fall migration survey period (August 1 to October 15). The required timing window for each survey round is provided in Table 1. Autonomous Recording Units (ARUs) are deployed at a subset of the transmission line wetlands in the spring and are retrieved in the fall (Table 1).

**Table 1: Waterbird Survey Season, Timing, Frequency, and Location**

Survey Period	Survey Period Date Ranges	Peace River (Boat Surveys)	Transmission Line (Ground Surveys)
Spring	Early (April 1 – April 14)	Two Rounds Required	-
	Middle (April 15 – May 6)	-	One Round Required
	Late (May 7 – May 30)	-	One Round Required + Deploy ARUs
Fall	Early (August 1 – 14)	One Round Required	One Round Required + Retrieve ARUs
	Middle (August 15 – September 14)	One Round Required	One Round Required
	Late (September 15 – October 15)	One Round Required	One Round Required

Modified from Table 6 within the Program Plan (BC Hydro 2022).

## 2.2 Peace River Boat Surveys

Surveys were carried out by two Qualified Environmental Professionals (QEPs) knowledgeable in waterbird identification and habitat classification. Each round of boat surveys was completed over a two-day period. The first survey day was conducted from Hudson’s Hope to the Site C Dam (upstream of the dam, in the reservoir fill area). The second day involved surveying from the Site C Dam to the Alberta border (downstream of the dam).

Surveys began directly after leaving the boat launch to prevent flushing birds during mobilization to the survey start point. Two boat operators from Kristoff Contracting were used across five survey rounds. The boat maintained a speed of 30 to 40 kilometers per hour (km/hr), with higher speeds necessary (e.g., 45 to 50 km/hr) in shallow backchannels (to prevent getting stuck on gravel bars). The route for each survey was recorded using GPS tracking in ESRI’s ArcGIS Field Maps application. If water levels were high enough, the boat circled around all accessible islands and backchannels in addition to travelling the mainstem of the river. The QEPs scanned using binoculars and the naked eye to detect and identify birds within the Peace River. The digital data collection application ESRI ArcGIS Survey123 was used to record the required data variables during the boat surveys (Appendix B). Basic details (e.g., date, time, surveyors) were recorded once per survey; weather details and flow measurements were recorded at the start and end of the survey. Each waterbird observation was recorded with associated habitat data.

Due to the size of the reservoir making it difficult to see across when surveying directly in the middle, upstream surveys consisted of a pass along the north and south side of the reservoir. Care was taken by QEPs not to double count birds that may have flown across the river between passes. Downstream surveys, due to the small width making it easier to see across the river, consisted of one pass from the dam to the Alberta – British Columbia border.

## 2.3 Moberly Plateau Transmission Line Wetland Surveys

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Two types of visual surveys were conducted to record diurnally active waterbirds at three types of wetland habitats: standwatch surveys were conducted at open water areas, and fixed-length transects were conducted at sedge and willow-sedge wetland habitats. The wetland habitat composition (sedge or willow-sedge vegetation type and whether there was standing open water) determined which of the survey types was appropriate. If a given wetland site had a combination of habitats (e.g., open water pond surrounded by sedge wetland), then that site would have more than one type of survey completed.

Some wetlands that were surveyed in previous years but not in 2025 have been included in Figure 5a-c. These wetlands were dropped from surveying efforts due to access issues; however, they may be reincluded in future years.

### 2.3.1 Standwatch Surveys

Standwatch surveys were conducted when the wetland site contained visible open water with average water depths greater than 0.5 metres (m). The presence of open water habitat can vary seasonally or annually depending on climatic conditions (e.g., amount of annual precipitation). The QEPs scanned the open water area using binoculars and the naked eye to detect and identify waterbird species. Each standwatch survey was 20 minutes (mins) in duration and observations were recorded within ESRI's ArcGIS Survey123 digital data collection application (Appendix C). The surveyors would use a 30-60x magnification spotting scope on a tripod to assist with the identification of waterbirds observed from further distances.

As per the Program Plan (BC Hydro 2022), two open water standwatch surveys were repeated for each transmission line survey round to provide estimates of detection rates (to be calculated in future analyses).

### 2.3.2 Transect Surveys

Transect surveys were conducted at wetland sites that contained at least 5 m of contiguous sedge or willow-sedge habitat with average water depths of less than 0.5 m. Each transect was approximately 100 m in length and took the surveyor 5-10 mins to walk. Each transect was recorded using GPS tracking in the Field Maps application. Surveyors walked in the appropriate habitat type and recorded waterbirds that were visually observed (including those flying overhead), heard nearby, or were flushed from vegetation or small areas of nearby open water. The surveyor recorded the width of the contiguous habitat type where the transect occurred, the proportion of the wetland site that was open water, sedge, or willow-sedge habitat, and the estimated water depth within each habitat type. Appendix C provides the full suite of variables collected while conducting a sedge transect or a willow-sedge transect. If multiple transects of the same habitat type (e.g., sedge) were conducted at the same wetland site on the same day, then the transect name was given a numerical suffix ending of 01 or 02 to differentiate the surveys.

### 2.3.3 ARU Deployment

ARUs were used to capture vocalizations from crepuscular and nocturnal waterbird species of interest. Four key marsh-dwelling species have been identified in the Program Plan: American Bittern (*Botaurus lentiginosus*), Sora (*Porzana carolina*), Yellow Rail (*Coturnicops noveboracensis*), and Virginia Rail (*Rallus limicola*) (BC Hydro 2022).

Per monitoring year, a minimum of six wetland sites have an ARU deployed from mid-May to mid-July with the goal of detecting one or more of the marsh bird species of interest. The ARUs are deployed within sedge or willow-sedge habitat with an area of at least 150-200 m of suitable habitat present. To reduce potential noise interference at the deployment site, trees or shrubs with few branches or obstacles were selected for ARU placement, or surveyors trimmed twigs and branches near the ARU. ARUs were secured to the trees with screws or zip ties at a height of 1 m or higher. External microphones were aimed toward marsh bird habitat. Each ARU was programmed to record an audio file 10 mins long every 60 mins (i.e., every hour) starting 30 mins before sunset and concluding 30 mins after sunrise.

## 3.0 DATA ANALYSIS

Waterbird observations were analyzed and presented using the following metrics:

- Species richness.
- Species evenness (the degree of similarity in abundance of each species).
- Total abundance (i.e., the total number of waterbirds observed).
- Density, calculated as birds per kilometre-squared (km<sup>2</sup>; open water and Peace River habitats), or birds per km (sedge and willow-sedge wetland habitats).

Observations of waterbirds that could not be identified to the species level (i.e., unknown waterbird observations) were excluded from richness and evenness calculations. However, counts of unknown waterbird observations were included in abundance and density calculations.

Each parameter was summarized by foraging guild and by survey round. From the 2024 report onwards, five duck species that were previously classified as dabbling ducks were reassigned into different foraging guild categories. Canvasback (*Aythya valisineria*), Redhead (*Aythya americana*), Ring-necked Duck (*Aythya collaris*), Greater Scaup (*Aythya marila*), and Lesser Scaup (*Aythya affinis*) were reassigned to the benthic-feeding divers foraging guild because those five species are classified as diving ducks by the Cornell Lab of Ornithology (Cornell University 2025) and within the BC Resource Inventory Committee standards *Inventory Methods for Waterfowl and Allied Species: Loons, Grebes, Swans, Geese, Ducks, American Coot and Sandhill Crane* (Resources Inventory Committee 1999).

Additionally, while taxonomically a shorebird, Wilson's snipe (*Gallinago delicata*) were treated as marsh birds during data analysis due to their foraging habits aligning more closely to marsh birds rather than shorebirds, i.e., Wilson's snipe's habit of secretively probing for food in tall grass rather than open mudflats like other shorebirds (Mueller 2020). This is consistent with previous reporting efforts (Saulteau EBA Environmental Services Joint Venture 2025, Ausenco Sustainability 2023; 2024).

### 3.1.1 Species Richness and Evenness

Species richness (the number of species) and species evenness were selected as metrics to characterize waterbird diversity (BC Hydro 2022). Diversity metrics can be used to evaluate change in waterbird community structure across different survey locations and monitoring years.

Species richness and evenness were only assessed for birds identified in the mainstem and moderate flow habitat categories of the Peace River (i.e., areas of the river that were surveyed all five rounds) to account for differences in survey effort. Limited flow habitat and other backchannels could not be assessed for most survey dates due to

low water levels caused by the dam and relatively low rainfall during the field season. Species richness was summarized by foraging guild and survey round.

Species evenness was calculated for each survey round using Pielou’s evenness index (MacDonald et al. 2017):

$$Species\ evenness = \frac{(-\sum_{i=1}^S(p_i \times \ln p_i))}{(\ln S)}$$

Where  $S$  is the number of species (i.e., species richness),  $p_i$  is the proportion of all sampled waterbirds represented by species  $i$ , and  $\ln$  is the natural logarithm.

## 3.2 Peace River Boat Surveys

### 3.2.1 Waterbird Abundance

Waterbird abundance on the Peace River was summarized in terms of total abundance by foraging guild and survey round, as well as by calculating the density of detected waterbirds per km<sup>2</sup>. Density was calculated by dividing the total abundance of waterbirds by the total area of the river surveyed (in km<sup>2</sup>) for each survey round. The area of the Peace River surveyed on each of the five survey rounds differed depending on the water level, as on certain dates the boat could access backchannels. Table 2 shows the total area of the Peace River surveyed during each survey round.

**Table 2: Total Area of the Peace River Surveyed (km<sup>2</sup>) for each Survey Round in 2025**

Total Area Surveyed (km <sup>2</sup> )	Spring		Fall		
	Apr 2 - 3	Apr 10 - 11	Aug 3 - 4	Sep 3 - 4	Sep 21 - 22
	28.63	66.27	89.71	94.05	77.44

The varying areas between survey rounds was mostly due to unexpected weather conditions on the reservoir. For the April 2 - 3 survey, the majority of the reservoir could not be surveyed due to ice, but downstream was fully completed including all backchannels. The April 10 – 11 and September 21 – 22 survey rounds had a lower total area surveyed due to heavy wind, ice (for the April surveys), and debris on the reservoir, resulting in partial surveys. The August 3 – 4 survey is slightly lower than normal due to low water downstream. Only the Sep 3 – 4 period represents a full reservoir and downstream survey, however, downstream also had low water levels and most back channels were inaccessible. The area calculated was based on the assumption that the reservoir was near normal level at this date.

Density was summarized by foraging guild, river habitat type, and treatment area. The river habitat categories are described below and displayed in Figures 2a-d. Descriptions are adapted from Table 10 of the Program Plan (BC Hydro 2022). The minimal connectivity habitat type has been excluded from this report due to issues with access because of low water levels and the lack of observations when this habitat type was accessible. The minimal connectivity habitat constitutes an area of minimal or no connectivity to the river (e.g., lentic [still freshwater] features) except during extreme high water or flooding events. It has minimal or no flow, and silty or otherwise fine-grained substrates. This habitat type is mostly shallow and includes ephemeral ponds; both emergent and submergent aquatic vegetation occur (BC Hydro 2022). As the reservoir completed filling in November 2024, all Peace River surveys in 2025 upstream of the dam were in reservoir habitat.

## River Habitat Categories

- **Limited Connectivity:** limited connectivity to the river (i.e., backchannels primarily connected to the river at the downstream end) with relatively low flow rate and volumes, and fine substrates (e.g., silts and sands). Many shallow areas are only inundated when river levels are high. Submergent aquatic vegetation occurs along the shoreline.
- **Moderate Flow:** consistently connected to the river (e.g., side channels connected on upstream and downstream ends) with relatively moderate flows and moderately sized substrates (e.g., sand, gravel). Shallow waters typically inundate most of the riverbed. Aquatic vegetation is sparse.
- **Mainstem:** main channel of the river where water flow rates, depths, and substrate size (e.g., gravel, cobble) are greatest. Permanently inundated. Aquatic vegetation is sparse or absent.
- **Reservoir:** the widest area of the river where water flow rates are slow and depth is greatest, similar to lentic (i.e., lake) systems. Permanently inundated with variable sizes of substrate and amounts of debris (during 2025 conditions). Aquatic vegetation is sparse or absent.

The treatment areas for the Peace River are described below and displayed on Figure 3:

- **Inundation impact area:** the area of the Peace River that is flooded (inundated) with water (from Hudson's Hope to the Site C Dam).
- **Flow regime impact area:** the area where water flow is controlled by the dam (downstream of the Site C Dam to the confluence with the Pine River).
- **Control area:** the area where water level and flow will remain comparable to historical conditions (downstream of the confluence with the Pine River to the Alberta border).

## 3.3 Moberly Plateau Transmission Line Wetland Surveys

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### 3.3.1 Waterbird Abundance

Total abundances for the transmission line were identified for both standwatch and transect surveys and were summarized by wetland station ID. Total abundances represent the sum of waterbirds from all survey rounds.

For standwatch surveys, waterbird abundance was summarized by density (waterbirds per km<sup>2</sup>). Density was reported in terms of km<sup>2</sup> to maintain consistency with previous reports. The area used to calculate density was the amount of surveyed open water for each wetland for which a standwatch survey was conducted. The areas of open water wetlands that were surveyed in 2025 were estimated from Google Earth imagery (Google Earth Pro 2025). Table 3 lists the areas surveyed for each wetland where a standwatch survey was conducted. The presence of open water habitat can vary seasonally or annually depending on climatic conditions (e.g., amount of annual precipitation).

**Table 3: Areas (km<sup>2</sup>) of Open Water Wetlands Surveyed in 2025**

Number	Wetland Station ID	Area of Open Water Surveyed (km <sup>2</sup> )
1	OW01	1.117
2	OW02	0.632
3	OW04	0.059
4	OW06	0.102
5	OW07	0.001
6	OW11	0.003
7	OW12	0.001
8	OW13	<0.001
9	SE03	0.010
10	SE05	0.002
11	SE07*	<0.001
12	SE09	0.001
13	SE10	0.001
14	SE12	0.001
15	SE14**	<0.001

\*SE07 was only surveyed as a standwatch during the May 21 – May 23 survey round.

\*\*SE14 was not surveyed as a standwatch during the May 21 – May 23 and August 22, September 2 – September 5 survey round.

Mean density was calculated as the total number of birds divided by the area of surveyed wetland habitat and averaged within survey rounds and foraging guilds.

### 3.4 ARU Data Analysis

ARU analysis used the bird sound recognition tool BirdNET Analyzer (version 2.3.0+) to analyze the audio recording files for the presence of American Bittern, Sora, Yellow Rail, and Virginia Rail. BirdNET is a tool for acoustic analysis that uses the pre-trained models from Cornell Lab of Ornithology and Chemnitz University of Technology to identify bird species from their vocalizations (Kahl et al. 2021; Symes et al. 2023).

In 2025, an additional approach using basic cluster analysis in Kaleidoscope Pro (version 5.7.0) on all wetlands was used after BirdNET analysis was completed, as using both programs in a two-step approach been shown to significantly improve detection rates (Pérez-Granados et al. 2024).

The settings used in BirdNET are listed in Table 4.

**Table 4: BirdNET Settings for 2025 ARU Analysis**

Setting Category	Setting Name	Setting Selection
Inference Settings	Minimum Confidence	0.5
	Sensitivity	1
	Overlap	1
	Minimum Bandpass Frequency (Hz)	0
	Maximum Bandpass Frequency (Hz)	15,000
Species Selection	Species List	Custom Species List*
Output Settings	Result Type	Kaleidoscope
	Combine Selection Tables?	Yes
	Skip Existing Results?	No
Other	Batch Size	1
	Threads	4
	Locale	EN

\*American Bittern, Sora, Yellow Rail, and Virginia Rail.

Recordings where one of the target species was identified by BirdNET or Kaleidoscope Pro were manually verified by a QEP. Manual verification of recordings where the target species was identified only occurred until a positive verification at each survey location was attained (i.e., until presence/absence was verified). Data analysis was conducted using BirdNET and Kaleidoscope Pro for all nine survey locations. Default signal parameters were used for cluster analysis. For each cluster, five of the vocalizations closest to the centre of the cluster (i.e., most similar) were manually verified, and five vocalizations furthest from the centre of the cluster were verified.

## 4.0 RESULTS

Appendix D provides a full list of the waterbird species observed in the 2025 monitoring year, including each species' foraging guild and total abundance.

### 4.1 2025 Survey Dates

Table 5 outlines the 2025 survey rounds when the Peace River boat surveys and transmission line wetland surveys were conducted.

**Table 5: Survey Dates for Waterbird Monitoring in 2025**

Survey Period	Peace River Survey Rounds	Transmission Line Survey Rounds
Spring	April 2 - 3	May 3 – May 5
	April 10 - 11	May 21 - 23 (ARUs deployed)
Fall	August 3 - 4	August 5 - 7
	September 3 - 4	August 22, September 2 – 5 (ARUs retrieved)
	September 21 - 22	September 18 - 20

## 4.2 Peace River Boat Surveys

### 4.2.1 Species Richness and Evenness

The total species richness in the Peace River study area in 2025 was 25 (excluding unknown birds) (Appendix D).

The species richness in 2025 during the spring migration was highest during April 10 - 11 (10 species) and in the fall migration was highest during September 3 - 4 (18 species) (Table 6). During the spring and fall survey periods, the highest species richness was observed in the dabbling ducks foraging guild (Table 6). There were zero detections of marsh birds and cranes and herons during the Peace River boat surveys.

Pielou's evenness index ranged from 0.5 to 0.7 across the survey rounds.

**Table 6: Peace River Species Richness in 2025**

Foraging Guild	Spring		Fall		
	Apr 2 - 3	Apr 10 - 11	Aug 3 - 4	Sep 3 - 4	Sep 21 - 22
Benthic-feeding Divers	1	2	3	2	2
Piscivorous Divers	1	1	3	4	3
Dabbling Ducks	1	4	2	5	2
Large Dabblers	2	3	1	2	1
Cranes and Herons	0	0	0	0	0
Shorebirds	0	0	2	2	0
Gulls and Surface-feeding Terns	0	0	4	3	4
Marsh Birds	0	0	0	0	0
<b>Total Richness</b>	5	10	15	18	12
<b>Pielou's Evenness</b>	<b>0.67</b>	<b>0.60</b>	<b>0.71</b>	<b>0.54</b>	<b>0.66</b>

Note: Observations of unknown species were excluded from the richness and evenness calculations.

### 4.2.2 Waterbird Abundance

In terms of total abundance, boat surveys detected 7141 waterbirds across spring and fall, 2025 (Table 7). In the spring, the highest total abundance was observed for the April 2 - 3 survey round (Table 7). In the fall, the highest total abundance was observed for the September 2 - 3 survey round (Table 7). Large dabblers attained the highest total abundance out of all the foraging guilds with a total of 3015 birds, comprising 42% of all waterbirds (Table 7). Of these large dabblers, 99% consisted of Canada Goose (*Branta canadensis*) with the remaining 1% consisting of Trumpeter Swan, Cackling Goose, and a single Greater White-fronted Goose.

**Table 7: Peace River Absolute Waterbird Abundances in 2025**

Foraging Guild	Spring		Fall		
	Apr 2 - 3	Apr 10 - 11	Aug 3 - 4	Sep 3 - 4	Sep 21 - 22
Benthic-feeding Divers	441	70	7	1	75
Piscivorous Divers	90	87	18	26	14
Dabbling Ducks	709	627	41	112	87
Large Dabblers	1665	529	123	488	210
Cranes and Herons	0	0	0	0	0
Shorebirds	0	0	57	102	0
Gulls and Surface-feeding Terns	0	0	282	1080	168
Marsh Birds	0	0	0	0	0
Unknown Waterbirds	0	0	1	2	29
<b>Total Abundance</b>	2905	1313	529	1811	583

The total mean densities of waterbirds detected in each habitat type of the Peace River in 2025 varied similarly, ranging from 0.15-0.70 birds per km<sup>2</sup> (Table 8). The highest total abundance of waterbirds was detected in the reservoir, comprising 42% of all detections, with the Peace River mainstem having a similar amount with 40% of all detections. Limited flow habitat had the highest total mean density by a significant margin (0.70 birds/km<sup>2</sup>) out of all the habitat types (Table 8). Dabbling ducks had the highest mean density in limited connectivity (1.09 birds/km<sup>2</sup>) and reservoir habitats (0.17 birds/km<sup>2</sup>). In moderate flow habitats, large dabblers had the highest mean density (0.41 birds/km<sup>2</sup>). In mainstem habitats, benthic-feeding divers had the highest density (0.31 birds/km<sup>2</sup>). Shorebirds and gulls and surface-feeding terns had the highest mean densities in reservoir habitats (0.09 and 0.35 birds/km<sup>2</sup>, respectively) Piscivorous divers had equally high density in the limited flow, moderate flow, and mainstem habitats (0.10 birds/km<sup>2</sup>) (Table 9). Cranes and herons and marsh birds had no detections in any survey round.

**Table 8: Mean Density (birds/km<sup>2</sup>/survey round) in the Peace River Habitat Types in 2025**

Foraging Guild	River Habitat Type			
	Limited Connectivity	Moderate Flow	Mainstem	Reservoir
Benthic-feeding Divers	0.09	0.39	0.31	0.11
Piscivorous Divers	0.10	0.10	0.10	0.02
Dabbling Ducks	1.09	0.34	0.18	0.17
Large Dabblers	0.73	0.41	0.22	0.13
Cranes and Herons	0	0	0	0
Shorebirds	0	0.04	0.02	0.09
Gulls and Surface-feeding Terns	0	0.22	0.07	0.35
Marsh Birds	0	0	0	0
Unknown Waterbirds	0	0	0.06	0.04
<b>Total Mean Density</b>	<b>0.70</b>	<b>0.34</b>	<b>0.18</b>	<b>0.15</b>
<b>Total Abundance</b>	<b>322</b>	<b>927</b>	<b>2838</b>	<b>3054</b>

The mean densities of waterbirds detected in each treatment area of the Peace River in 2025 ranged from 0.02-0.41 birds per km<sup>2</sup> (Table 9). The control area had the highest total mean density (0.24 birds/km<sup>2</sup>) and the inundation impact area had the highest total abundance (3054 birds) (Table 9). In the inundation impact area, gulls and surface-feeding terns had the highest mean density (0.35 birds/km<sup>2</sup>). In the flow regime impact area, dabbling ducks had the highest density (0.27 birds/km<sup>2</sup>) and in the control area, large dabblers had the highest density (0.29 birds/km<sup>2</sup>) (Table 9). Of the unknown waterbirds across treatment areas, 50% were categorized as “unknown gull”, 47% as “unknown duck”, and 3% as “unknown shorebird”. Figures 4a-d show the mean densities of waterbirds in the Peace River treatment areas, grouped by habitat polygons.

**Table 9: Mean Density (Birds/Km<sup>2</sup>/Survey Round) in the Peace River Treatment Areas in 2025**

Foraging Guild	Treatment Areas		
	Inundation Impact Area	Flow Regime Impact Area	Control Area
Benthic-feeding Divers	0.11	0.17	0.41
Piscivorous Divers	0.02	0.12	0.08
Dabbling Ducks	0.17	0.27	0.23
Large Dabblers	0.13	0.25	0.29
Cranes and Herons	0	0	0
Shorebirds	0.09	0.02	0.03
Gulls and Surface-feeding Terns	0.35	0.10	0.06
Marsh Birds	0	0	0
Unknown Waterbirds	0.04	0.06	0.05
<b>Total Mean Density</b>	0.15	0.18	0.24
<b>Total Abundance</b>	<b>3054</b>	<b>1324</b>	<b>2763</b>

## 4.3 Moberly Plateau Transmission Line Surveys

### 4.3.1 Wetlands Surveyed in 2025

Table 10 and Figures 5a-c outline the transmission line wetlands that were surveyed in 2025 and the types of surveys that were conducted at each wetland. All wetlands were surveyed for all survey rounds. OW14 was removed last year during the 2024 monitoring program due to difficulties with access, lack of a suitable vantage for standwatch surveys, and lack of suitable habitat for transect surveys, which also posed issues when attempted during the 2025 season.

SE07 and SE14 were surveyed as standwatches when conditions were appropriate to do so. When water levels were low, transect surveys were conducted instead.

If multiple transect surveys of the same type were completed at the same wetland site, on the same day (e.g., SE-TRANS01, SE-TRANS02), they were combined in Table 10 and considered to be a single unique survey.

**Table 10: Locations of Open Water (OW), Sedge (SE), and Willow-sedge (WS) Surveys in 2025**

Number	Wetland ID	April 29 – May 6			May 20 - 24			August 5 - 7			August 23, September 1-3			September 18 - 20		
		OW	SE	WS	OW	SE	WS	OW	SE	WS	OW	SE	WS	OW	SE	WS
1	OW01	✓*	✓		✓*	✓		✓*	✓		✓*	✓		✓*	✓	
2	OW02	✓			✓			✓			✓			✓		
3	OW04	✓			✓			✓			✓			✓		
4	OW06	✓*	✓	✓	✓*		✓*	✓*	✓	✓	✓*	✓	✓	✓*	✓	✓
5	OW07	✓			✓			✓			✓			✓		
6	OW11	✓			✓			✓			✓			✓		
7	OW12	✓	✓		✓	✓		✓	✓		✓	✓		✓	✓	
8	OW13		✓*			✓*			✓*			✓*			✓*	
9	SE02		✓	✓		✓*			✓	✓			✓		✓	
10	SE03	✓			✓			✓			✓			✓		
11	SE04		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
12	SE05	✓			✓			✓			✓			✓		
13	SE06		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
14	SE07	✓				✓	✓		✓	✓		✓	✓		✓	✓
15	SE09	✓	✓		✓	✓		✓	✓		✓	✓		✓	✓	
16	SE10	✓			✓			✓			✓			✓		
17	SE11		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
18	SE12	✓			✓			✓			✓			✓		
19	SE14	✓			✓			✓			✓			✓		
20	WS01		✓	✓		✓			✓	✓		✓	✓		✓	✓
21	WS02			✓*			✓*			✓*			✓*			✓*
22	WS03			✓*			✓*			✓*			✓*			✓*
	<b>Total</b>	<b>16</b>	<b>11</b>	<b>10</b>	<b>14</b>	<b>13</b>	<b>10</b>	<b>15</b>	<b>12</b>	<b>11</b>	<b>15</b>	<b>11</b>	<b>11</b>	<b>15</b>	<b>12</b>	<b>11</b>

\* Indicates two surveys were performed.

As per the Program Plan (BC Hydro 2022), in each survey round, at least 10 surveys should be conducted in each wetland habitat type (e.g., open water, sedge, willow-sedge). This target was met in 2025, but not in 2024 due to the high water levels causing a lack of access to appropriate willow-sedge habitat in certain seasons.

A total of 22 wetlands were surveyed in 2025 (Table 10). SEES JV completed 75 open water standwatch surveys, 59 sedge transect surveys, and 53 willow-sedge transect surveys, for a total of 187 transmission line wetland surveys (Table 10). This amount is comparable to previous survey efforts performed by Ausenco and SEES JV; in 2022, 2023, and 2024, the survey totals were 157, 139, and 161, respectively (Ausenco Sustainability ULC 2024).

### 4.3.2 Species Richness and Evenness

The total species richness for 2025 in the transmission line survey area was 34 (excluding unknown birds) (Appendix D). The wetland with the highest species richness was OW06 (22 species). SE07, WS01, and WS02 were tied for the lowest species richness (0 species). A full list of species observed in each of the transmission line wetlands is provided in Appendix E.

The highest species richness for standwatch surveys was observed during the late spring period (27 species) and the early spring period (20 species) (Table 11). For transect surveys, the highest species richness in the spring was observed from May 21 - 23 (7 species). No species were observed in the fall. The open water standwatch surveys consistently resulted in higher species richness compared to the transect surveys, regardless of the survey round (Table 11). Including spring and fall survey periods, standwatch surveys detected 34 species total and transect surveys detected 7 species total (excluding unknown birds).

All species guilds had greater richness during standwatch surveys than transect surveys (Table 11). The cranes and herons guild had the lowest species richness for the standwatch surveys. For transect surveys, benthic-feeding divers, gulls and surface-feeding terns, cranes and herons, and piscivorous divers had the lowest species richness (0 species).

Evenness ranged from 0.65 to 0.86 on Pielou's evenness index for standwatch surveys and from 0 to 0.83 for transect surveys (where values of zero resulted from zero or a single species detection) (Table 11). For the standwatch surveys, species evenness was relatively consistent across survey rounds except for late fall, which had the highest evenness value at 0.86 (Table 11).

**Table 11: Transmission Line Species Richness in 2025**

Foraging Guild	Spring		Fall		
	May 3 - May 5	May 21 - May 23	Aug 5 - Aug 7	Aug 22, Sep 2 - Sep 5	Sep 18 - Sep 20
<b>Standwatch Surveys</b>					
Benthic-feeding Divers	4	6	4	3	4
Piscivorous Divers	5	5	4	4	3
Dabbling Ducks	5	5	4	3	4
Large Dabblers	2	2	1	1	1
Cranes and Herons	0	1	0	0	0
Shorebirds	3	5	3	2	1
Gulls and Surface-feeding Terns	0	1	1	0	0
Marsh Birds	1	2	1	1	0
<b>Total Richness</b>	<b>20</b>	<b>27</b>	<b>18</b>	<b>14</b>	<b>13</b>
<b>Pielou's Evenness</b>	<b>.69</b>	<b>.70</b>	<b>.75</b>	<b>.65</b>	<b>0.86</b>
<b>Transect Surveys</b>					
Benthic-feeding Divers	0	0	0	0	0
Piscivorous Divers	0	0	0	0	0
Dabbling Ducks	0	2	0	0	0
Large Dabblers	0	1	0	0	0

Foraging Guild	Spring		Fall		
	May 3 - May 5	May 21 - May 23	Aug 5 - Aug 7	Aug 22, Sep 2 - Sep 5	Sep 18 - Sep 20
Cranes and Herons	0	0	0	0	0
Shorebirds	0	2	0	0	0
Gulls and Surface-feeding Terns	0	0	0	0	0
Marsh Birds	1	2	0	0	0
<b>Total Richness</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Pielou's Evenness</b>	<b>0*</b>	<b>.83</b>	<b>0</b>	<b>0</b>	<b>0</b>

Note: Observations of unknown species were excluded from the richness and evenness calculations.

\* Pielou's evenness is undefined or equal to 0 for species counts equal to or less than 1.

### 4.3.3 Waterbird Abundance for Standwatch Surveys

In terms of total abundance, standwatch surveys detected 2170 waterbirds across spring and fall survey periods in 2025 (Table 12). The wetland with the highest total abundance of waterbirds for standwatch surveys (combining spring and fall survey periods), was OW06 (802 birds), followed by OW01 (684 birds) (Table 12). The wetland with the lowest total abundance of waterbirds for standwatch surveys was SE07 (7 birds), followed by OW12 (3 birds) (Table 12). The highest total abundance value across all wetlands in the spring survey period occurred during the May 21 – May 23 survey round (579 birds) and in the fall survey period occurred during the August 5 – August 7 survey round (459 birds) (Table 12).

**Table 12: Total Abundance in Surveyed Open Water Wetlands in 2025**

Number	Wetland ID	Spring		Fall			Total
		May 3 - May 5	May 21 - May 23	Aug 5 - Aug 7	Aug 22, Sep 2 - Sep 5	Sep 18 - Sep 20	
1	OW01	163	180	157	150	34	684
2	OW02	11	16	15	21	19	82
3	OW04	35	23	38	28	15	139
4	OW06	179	127	184	187	125	802
5	OW07	0	112	24	2	0	138
6	OW11	1	9	2	2	4	18
7	OW12	1	2	0	0	0	3
8	SE03	34	39	13	6	17	109
9	SE05	24	26	6	8	0	64
10	SE07	7	0	0	0	0	7
11	SE09	0	21	11	12	6	50
12	SE10	6	9	6	0	10	31
13	SE12	16	15	0	2	0	33
14	SE14	6	0	3	0	1	10
<b>Total</b>		<b>483</b>	<b>579</b>	<b>459</b>	<b>418</b>	<b>231</b>	<b>2170</b>

Abundance counts for open water standwatch surveys have been presented using the density-by-area method for each foraging guild during each survey round. The total abundance for each wetland station (combining abundances from standwatch and transect surveys) is displayed in Figures 6a-c.

The total mean density of waterbirds in surveyed open water wetlands was highest during May 3 – May 5 (1631.0 birds/km<sup>2</sup>) and the lowest from August 22, September 2 – September 5 (466.8 birds/km<sup>2</sup>) (Table 13). Species within the dabbling ducks foraging guild contributed to the highest mean densities in every survey round except for early fall, when the shorebirds had greater mean density (Table 13).

**Table 13: Mean Density (Waterbirds/Km<sup>2</sup>) in Surveyed Open Water Wetlands in 2025**

Foraging Guild	Spring		Fall		
	May 3 - May 5	May 21 – May 23	Aug 5 - Aug 7	Aug 22, Sep 2 - Sep 5	Sep 18 - Sep 20
Benthic-feeding Divers	122.0	405.5	501.8	140.2	97.6
Piscivorous Divers	14.7	7.6	13.9	46.9	4.5
Dabbling Ducks	3197.9	1527.7	1749.0	900.5	700.6
Large Dabblers	160.2	444.2	18.7	353.5	20.2
Cranes and Herons	0	100.0	0	0	0
Shorebirds	234.7	284.9	2081.4	416.7	39.2
Gulls and Surface-feeding Terns	0	2.7	42.5	0	0
Marsh Birds	333.3	346.8	222.8	167.1	0
Unknown Waterbirds	0	0.9	666.7	0	10000.0
<b>Total Mean Density</b>	<b>1631.0</b>	<b>885.6</b>	<b>968.6</b>	<b>466.8</b>	<b>556.0</b>

#### 4.3.4 Waterbird Abundance for Transect Surveys

In terms of total abundance, transect surveys detected a total of 22 waterbirds across spring and fall, 2025 (Table 14). The wetlands with the highest total abundance of waterbirds for transect surveys (combining spring and fall survey periods), were SE04 and SE02 (5 birds), followed by SE11 and WS03 (3 birds) (Table 14). Wetlands OW01, OW06, SE06, WS01, and WS02 had zero detections (Table 14). Spring transect surveys detected more birds than fall transect surveys (Table 14). No birds were detected at any fall transect survey. The highest total abundance value for transect surveys occurred during the May 21 – May 23 survey round at SE02 (5 birds) (Table 14).

**Table 14: Total Abundance in Surveyed Sedge and Willow-sedge Habitats in 2025**

Number	Wetland ID	Spring		Fall			Total
		May 3 - May 5	May 21 - 23	Aug 5 - 7	Aug 22, Sep 2 - 5	Sep 18 - 20	
1	OW01	0	0	0	0	0	0
2	OW06	0	0	0	0	0	0
3	OW12	0	1	0	0	0	1
4	OW13	0	2	0	0	0	2
5	SE02	0	5	0	0	0	5
6	SE04	4	1	0	0	0	5
7	SE06	0	0	0	0	0	0
8	SE07	0	1	0	0	0	1
9	SE09	0	1	0	0	0	1
10	SE11	0	3	0	0	0	3
11	SE14	0	1	0	0	0	1
12	WS01	0	0	0	0	0	0
13	WS02	0	0	0	0	0	0
14	WS03	0	3	0	0	0	3
<b>Totals</b>		<b>4</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>

Abundance counts for transect surveys have been presented using the density-by-area method for each foraging guild during each survey round. The total abundance for each wetland station (combining abundances from standwatch and transect surveys) is displayed in Figures 6a-c.

The mean density of waterbirds along transects was highest on May 21 – May 23 (13.9 birds/km) and was the lowest during all fall survey rounds (0 birds/km) (Table 15). The mean density of dabbling ducks, large dabblers, and shorebirds was the greatest in late spring. Dabbling ducks had the lowest density of detected foraging guilds (10.0 birds/km). Benthic-feeding divers, piscivorous divers, cranes and herons, gulls and surface-feeding terns, and unknown waterbirds had no detections during any survey round (Table 15).

**Table 15: Mean Density (Waterbirds/Km) in Surveyed Sedge and Willow-sedge Habitats in 2025**

Foraging Guild	Spring		Fall		
	May 3 - May 5	May 21 - 23	Aug 5 - 7	Aug 22, Sep 2 - 5	Sep 18 - 20
Benthic-feeding Divers	0	0	0	0	0
Piscivorous Divers	0	0	0	0	0
Dabbling Ducks	0	10.0	0	0	0
Large Dabblers	0	15.0	0	0	0
Cranes and Herons	0	0	0	0	0
Shorebirds	0	15.0	0	0	0
Gulls and Surface-feeding Terns	0	0	0	0	0
Marsh Birds	13.3	14	0	0	0
Unknown Waterbirds	0	0	0	0	0
<b>Total Mean Density</b>	<b>13.3</b>	<b>13.9</b>	<b>0</b>	<b>0</b>	<b>0</b>

### 4.3.5 ARUs at Transmission Line Wetlands

Ten ARUs were deployed from May 14-17 to August 3-5, 2024 (Table 16). All ARUs were in good condition upon retrieval except for the ARU at OW01, which was missing. In 2025, two out of the four key species were detected with ARUs (Sora and Virginia Rail). Table 16 illustrates which wetlands had positive detections of key species.

**Table 16: Detections of Key Species by ARU in 2025**

Number	Wetland ID	ARU ID	Number of Recording Nights used in Analysis	Analysis Program	Key Species			
					American Bittern	Sora	Virginia Rail	Yellow Rail
1	OW06	ARU05	54	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
2	SE03	ARU04	54	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
3	SE04	ARU08	53	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
4	SE05	ARU06	54	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
5	SE07	ARU09	55	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
6	SE09	ARU02	55	BirdNET	x	✓	✓	x
				Kaleidoscope	x	-	-	x
7	SE14	ARU07	54	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
8	WS01	ARU10	55	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
9	WS03	ARU03	54	BirdNET	x	✓	x	x
				Kaleidoscope	x	-	x	x
<b>Number of Wetlands with Species Detections</b>					<b>0</b>	<b>9</b>	<b>1</b>	<b>0</b>

Figures 7a-c show the spatial locations where ARUs were deployed in 2025 and which key species were identified.

## 5.0 DISCUSSION

### 5.1 Peace River Boat Surveys

As the reservoir was frozen longer than the downstream Control section, portions of the reservoir were not readily accessible by boat. Consequently, the Control section was completely surveyed in April whereas the reservoir was only partially surveyed (5-10% of the reservoir area). This skewed proportion could create future issues for data analysis when comparing reservoir results versus downstream results.

### 5.1.1 Species Richness and Evenness

The greater number of benthic-feeding divers, piscivorous divers, dabbling ducks and large dabblers in the control area compared to other foraging guilds may be due to the large amount of open water available (approximately 16.53 to 21.70 ha) to support these foraging guilds, as these guilds prefer moderate to deep waters with vegetation, invertebrates, and fish for foraging. While these guilds also had a strong presence in reservoir habitat, gulls and surface-feeding terns had the highest density of any foraging guild (0.35 birds/km<sup>2</sup>). This is likely due to the high number of gulls (total count of 1156) at the end of the reservoir near the dam congregating near the debris boom to forage, as the dam may cause fish to congregate (U.S. Army Corps of Engineers 2014). The close proximity of the dam to the nearby North Peace Regional Landfill, which serves as a significant attractant due to the diet habits of gulls (Belant et al. 1998), likely contributed to this number as foraging groups left the landfill to seek food in other nearby areas.

The lack of marsh birds detected during the boat surveys is consistent with results for the Peace River in 2023 and 2024 (Ausenco Sustainability ULC 2023; Saulteau EBA Environmental Services Joint Venture 2025). This may be due to the cryptic nature of these birds, their preference for vegetated wetland habitats, limited habitat accessibility by jet boat (Melvin and Gibbs 2020; Leston and Bookhout 2020), and their smaller size making them difficult to detect by boat. Cranes and herons similarly had no detections during boat surveys, likely due to these species preferring smaller wetlands over large open-water habitats with limited appropriate shoreline like the reservoir or fast-flowing river habitats like the control area (Winkler et al. 2020a)

Despite the varying amounts of total area surveyed (28.63 ha to 94.05 ha), species evenness remained relatively consistent, with late spring and mid-fall having the lowest species evenness (0.53 – 0.60). This could be due to both seasons with 1-3 species having large counts of birds compared to 10-18 species with relatively low counts of individual birds. For example, Mallards (*Anas platyrhynchos*) and Canada Geese made up 75% of observations in the late spring survey round, and Ring-billed Gull (*Larus delawarensis*), Franklin's Gull (*Leucophaeus pipixcan*), and Canada Goose made up 83% of observations in mid-fall.

### 5.1.2 Waterbird Abundance

While in 2025 there were more birds counted than 2024, this is still a marked decrease from observations in 2022 and 2023. As in the previous year, this appears to be mostly due to the lack of observations of Canada Goose. In 2025, the total abundance of Canada geese was significantly lower than in 2022 and 2023. (Ausenco Sustainability ULC 2023; 2024). This is likely due to weather and water conditions on the reservoir being a significant mitigating factor that also stifled survey efforts. Spring surveys were marred by heavy ice, debris from the reservoir filling, and wind, causing only a small section of the reservoir to be safely surveyed which potentially accounted for the reduced number of observations. Early and mid-fall surveys were cut short by heavy winds making survey conditions unsafe. The elongated shape and cleared shoreline of the reservoir makes it easier for windy conditions to develop, similar to natural lakes (Hayes et al. 2017). April surveys in future years should be spaced out within the survey period as much as possible and as late as possible to avoid missing spring migrants and to avoid ice. Future surveys should also take place as early in the morning as possible, as wind speeds on reservoirs tend to peak around midday (Roth and Blanken 2023).

The mainstem contributed the most out of all control area habitat types to total abundance, likely because birds prefer the protection that vegetated islands provide (from weather, predators, boats, etc.). Dabbling ducks and large dabblers had similar values and contributed the highest density in limited and moderate connectivity habitats, which may be due to their flighty nature; flighty birds tend to select for more secluded areas of the Peace River where they will not flush as often. Benthic-feeding divers had the highest density in the mainstem habitat; these species tend to seek out the deeper waters of the Peace River that provide appropriately deep foraging habitat (Winkler et al. 2020b). Density estimates for limited connectivity and moderate flow river habitat types are based on a smaller

number of observations and a smaller amount of habitat compared to the mainstem, as these habitats could not be surveyed during all rounds due to varying water levels affecting boat access.

Limited connectivity habitats have a very high total mean density but were only surveyed during the early spring survey round due to water levels affecting boat access. The small amount of area surveyed, in conjunction with large flocks of Mallards and Canada Geese seen during the one survey round, likely contributed to this inflated data.

The flow regime impact area comprises a smaller area than the other two treatments, which could explain why it has the lowest total abundance. Shorebirds had the lowest density in both the flow regime impact area and control area, with piscivorous divers having the lowest density in the inundation impact area. This could be due to the fact that the reservoir was unable to be fully surveyed during peak migration times in early spring due to low water levels compounded with the fact that these birds tend to congregate in lower numbers; the reservoir otherwise provides deeper waters, a larger open water area, and increased submerged vegetation and debris, which have increased foraging opportunities for diving species (Winkler et al. 2020b)

## 5.2 Moberly Plateau Transmission Line Surveys

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### 5.2.1 Species Richness and Evenness

Higher species richness was observed in sedge and willow-sedge habitats in the spring compared to the fall, which had no observations during any of the 3 rounds. This could be due to higher water levels in the spring from recent snowmelt attracting more birds. When the fall survey rounds were conducted, many of the sedge and willow-sedge habitats were significantly drier, potentially contributing to lower species richness as drier conditions are less suitable for most waterbirds due to the lack of sufficiently deep water for foraging. The Peace River region also experienced a drier spring and summer than is typical in 2025 (Government of Canada 2025), leading to lower water levels, potentially contributing to the lack of observations during fall transect surveys.

Open water wetland habitats had low species richness for gulls and surface-feeding terns during all survey rounds except for early fall, which is likely because all but one of the surveyed open water areas were small in size (<0.001 to 0.062 km<sup>2</sup>) and gulls and terns prefer larger open waterbodies such as lakes and rivers where there are more foraging opportunities (Winkler et al. 2020c). OW01 (Boucher Lake) was the only wetland which had detections for gulls and is the largest open water wetland surveyed (1.117 km<sup>2</sup>). Most observations came from a single flock of 95 Ring-billed Gulls (*Larus delawarensis*) at OW01 during mid-fall surveys, potentially a foraging flock (Pollet et al. 2020). Marsh birds were also detected sparingly and only during spring surveys, potentially due to their cryptic, nocturnal behaviour patterns being even more difficult to detect after the breeding season is over (Melvin and Gibbs 2020; Leston and Bookhout 2020). Cranes and herons were also detected only once during early spring, however, this is not inconsistent with previous years (Ausenco Sustainability ULC 2024; Saulteau EBA Environmental Services Joint Venture 2025).

Species evenness calculations were only available from the late spring survey round. This is likely because there were few species detected from the surveys, each with a low abundance (ranging from 1-11). While early spring did have a single species detection, the evenness calculation was 0, as evenness cannot be calculated when the number of species is equal or less than 1. For open water standwatch surveys, evenness was relatively consistent between spring surveys and early and mid-fall surveys (0.65 – 0.75), with late fall being the outlier with the highest evenness (0.086). The higher evenness during late fall is likely due to a large number of species and smaller flock sizes between bird species, unlike early fall, which had a lower abundance of waterbirds and larger single-species flock sizes.

## 5.2.2 Waterbird Abundance

There were several occasions where smaller-sized open water areas (e.g., SE03 with an open water area of 0.010 km<sup>2</sup>) had many waterbirds detected (e.g., between 11 and 38 individuals observed). When higher abundances and small areas are used to calculate density, the density value becomes inflated. The extrapolation of the data does not account for the realistic changes in open water habitat quality and microhabitat features, which affect waterbird density at larger scales.

The greatest density per foraging guild for transmission line surveys corresponded to the benthic-feeding divers, followed by dabbling ducks. Large flocks of Ring-necked Ducks (*Aythya collaris*) in early spring and early to mid-fall survey rounds comprised 49% of benthic-feeding divers observed at open-water wetlands. Benthic-feeding divers are diving ducks that feed on invertebrates or vegetation (in *Aythya* ducks) located along the bottom of lakes or other water sources and typically prefer shallow lakes with abundant submergent or emergent vegetation during migration (Winkler et al. 2020b). The surge in abundance of benthic-feeding divers compared to previous years could potentially be due to the relatively dry winter and low water levels (Government of Canada 2025) making submergent vegetation in OW01 and OW06 more accessible to Ring-necked Ducks, which prefer water levels less than 1.5 m feet deep (Roy et al. 2020).

During transect surveys, marsh birds had the highest density of all foraging guilds, comprising 40% of all detections. 91% of these detections were Wilson's Snipe (*Gallinago delicata*), a common, widespread marsh bird (Mueller 2020). The lack of other marsh bird species could also be due to the loud, obvious aerial displays Wilson's Snipes perform which can take place at any time of day (Mueller 2020) making them easier for surveyors to detect. The lack of other species in general could be attributed to lack of suitable habitat for non-marsh birds along transect lines and tall vegetation obscuring adjacent waterbirds from detection.

## 5.2.3 ARUs at Transmission Line Wetlands

In addition to BirdNET, Kaleidoscope cluster analysis was used on every wetland. Two-fold analysis has been shown to sharply improve detection rates, which is particularly useful for cryptic species (Pérez-Granados et al. 2024). Kaleidoscope cluster analysis has also been shown to be more effective than BirdNET at detecting low-frequency calls, such as those from bitterns (Manzano-Rubio et al. 2022). While no method detected Yellow Rail or American Bitterns in 2025, this two-fold approach may prove to be effective in future years.

All nine of the ARUs detected Soras, which could be due to the flexibility of their habitat requirements when it comes to selecting wetlands during the breeding season (Melvin and Gibbs 2020).

Virginia Rails were detected at one wetland. Wetland SE09 has a large, open area of sedge and willow-sedge habitat with small, fragmented sections of open water which are present in wet seasons. Rails were detected at SE11, SE07, and SE09 in 2022 (Ausenco Sustainability ULC 2023), and SEES JV detected Virginia Rails at OW06 and OW11 in 2024. These detections indicate that Virginia Rails may occupy a variety of wetland habitat types, provided that adequate vegetative cover is present (Conway and Pyle 2024). Surveys were conducted with consistent timing, overlapping the primary breeding period in each year and at similar times of day. Despite this consistency, there was variation in the wetlands where Virginia Rails were detected among years. This variation, while potentially influenced by seasonal or daily factors, may also reflect changes in water levels during wetter or drier years that cause Virginia Rails to seek alternative habitats (Conway and Pyle 2024).

American Bittern was not detected at any of the wetlands, which is consistent with previous monitoring years. This species is inconspicuous and regionally very rare (blue-listed<sup>1</sup> species in BC). According to the BC Species and Ecosystems Explorer, there are no historical observations of American Bittern for Fort St. John and the surrounding

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<sup>1</sup> Blue-listed species are provincially designated as Vulnerable or Special Concern (Harper 1994)

area (B.C. Ministry of Environment 2024). However, there have been reliable audio observations of American Bitterns in the Fort St. John area in 2014, 2015, and 2018, according to the citizen science website eBird (Cornell Lab of Ornithology 2023).

Yellow Rail was not detected by ARU in the nine wetlands in 2025. Both BirdNET and Kaleidoscope cluster analysis yielded the same results (zero detections) for all nine wetlands. In 2023, Yellow Rail was detected at OW11 and near OW01, and in 2022, it was detected at SE11 (Ausenco Sustainability ULC 2023; 2024). Due to the loss of ARU-01, no wetlands where Yellow Rail was previously detected were surveyed in 2025. This species may not have been present at the study wetlands in 2025. Alternatively, it's possible that the noise interference at the study wetlands (e.g., boreal chorus frog calls, loud and frequent songbird calls during early morning recording times), may have masked the more discreet call of the Yellow Rail in the ARU recordings.

## 6.0 CONCLUSION

This 2025 monitoring year marks the first full post-reservoir filling year of surveys for the Waterbird Migration Monitoring, as the reservoir finished filling in early November 2024. The methods outlined in the Program Plan that were used from 2017 to 2024 for Waterbird Migration Monitoring have successfully recorded the baseline data prior to reservoir filling that will be required to infer changes to waterbird abundance and diversity in the context of waterbird disturbance, displacement, mortality, and habitat alteration and fragmentation now that reservoir filling is complete. Future post-construction monitoring surveys should follow the same Program Plan, however, SEES JV has a few additional recommendations for consideration:

- Due to continuous bad weather in 2025 curtailing survey efforts, QEPs should consider additional contingency days in the event of consistently bad weather preventing full surveys in the future (e.g. surveying two mornings in a row).
- QEPs should continue spacing out the April surveys as much as feasible to increase the likelihood of capturing the majority of the spring migrators and to potentially avoid ice.
- Fall and spring surveys should take place as early as possible in the morning to avoid windy conditions on the reservoir.
- Consideration should be given to discussing future sampling design in light of the fact that early spring surveys on the reservoir will be impacted by ice, preventing full surveys and skewing data results.
- Kaleidoscope cluster analysis should continue to be used in tandem with BirdNET to potentially increase detections for target species in future years.

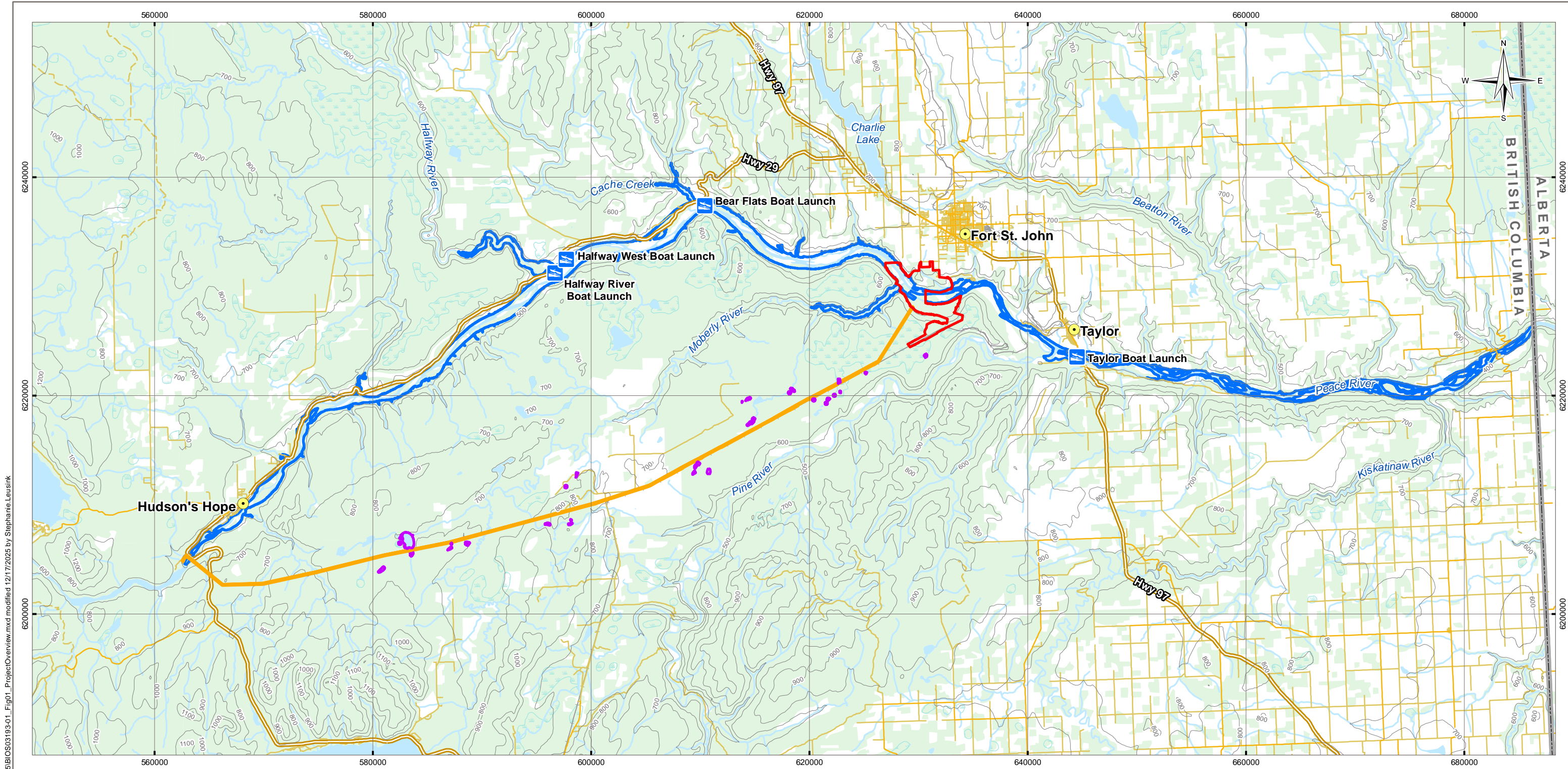
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**LEGEND**

- Boat Launch Location
- Site C Project Boundary
- Peace River Study Area
- Transmission Line Corridor
- Wetland Survey Station
- Populated Place
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Railway
- Residential Area
- Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Wooded Area
- Provincial Boundary

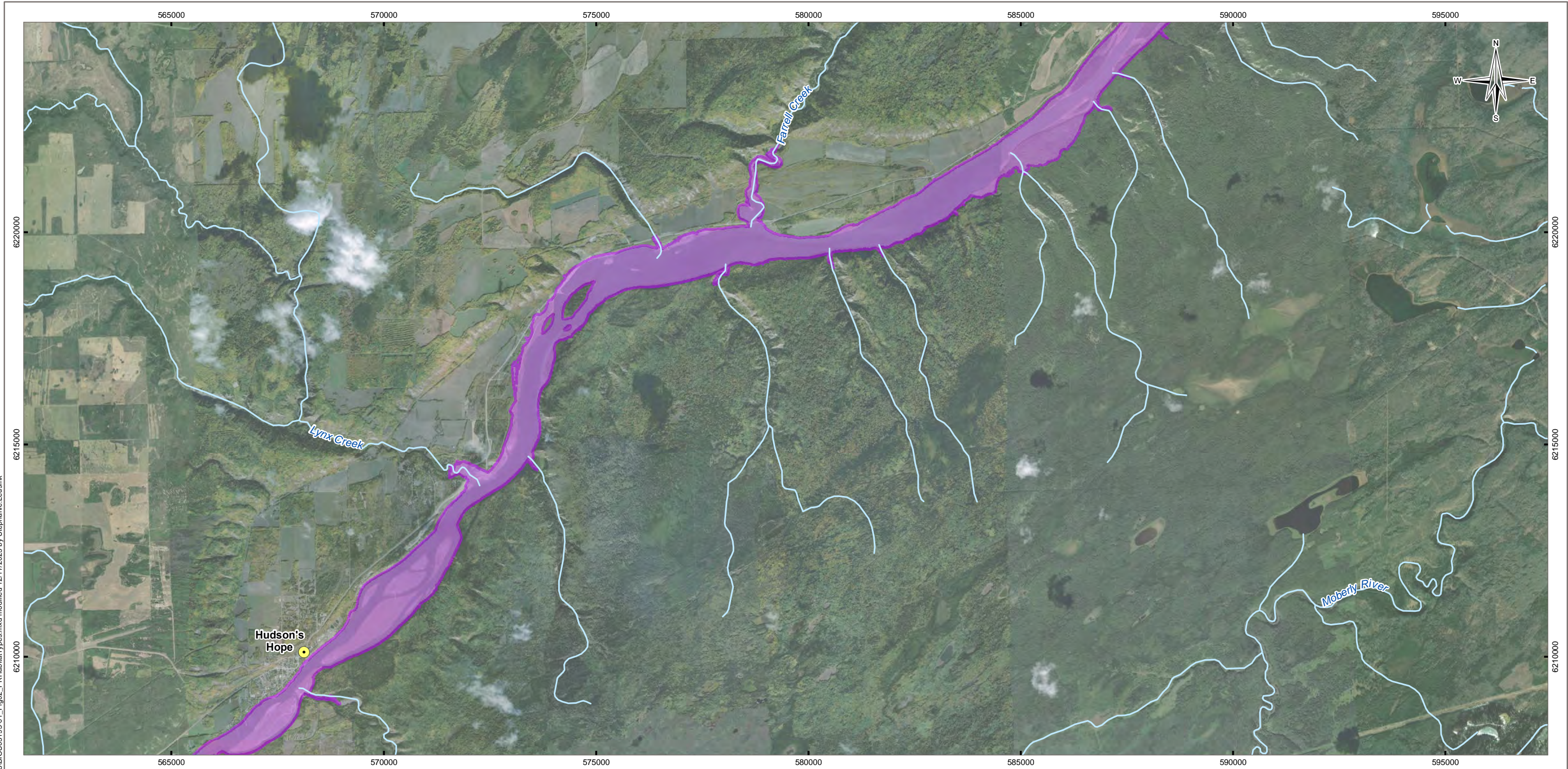
**NOTES**  
Base data source: CanVec 1:250,000.

**SITE C WATERBIRD  
2025 ANNUAL REPORT**

**Waterbird Survey Project Overview**

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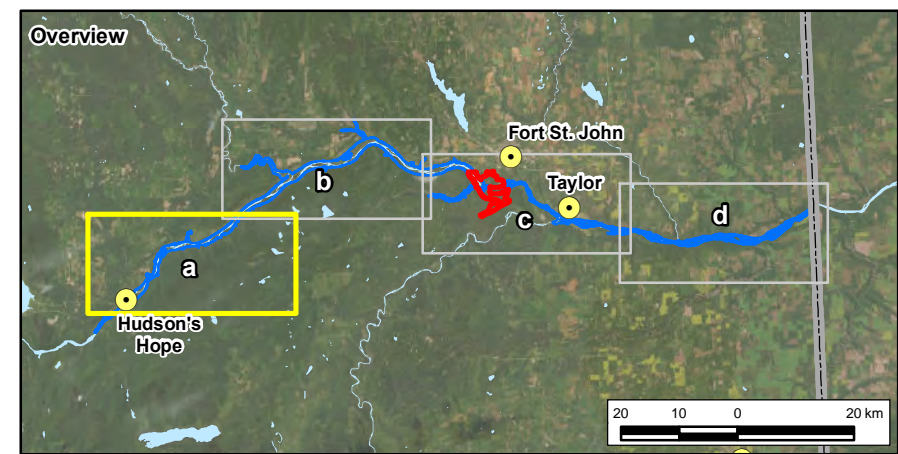
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**LEGEND**

- Populated Place
- Watercourse
- Habitat Types**
- Reservoir Level (461.8 metres above sea level)



**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

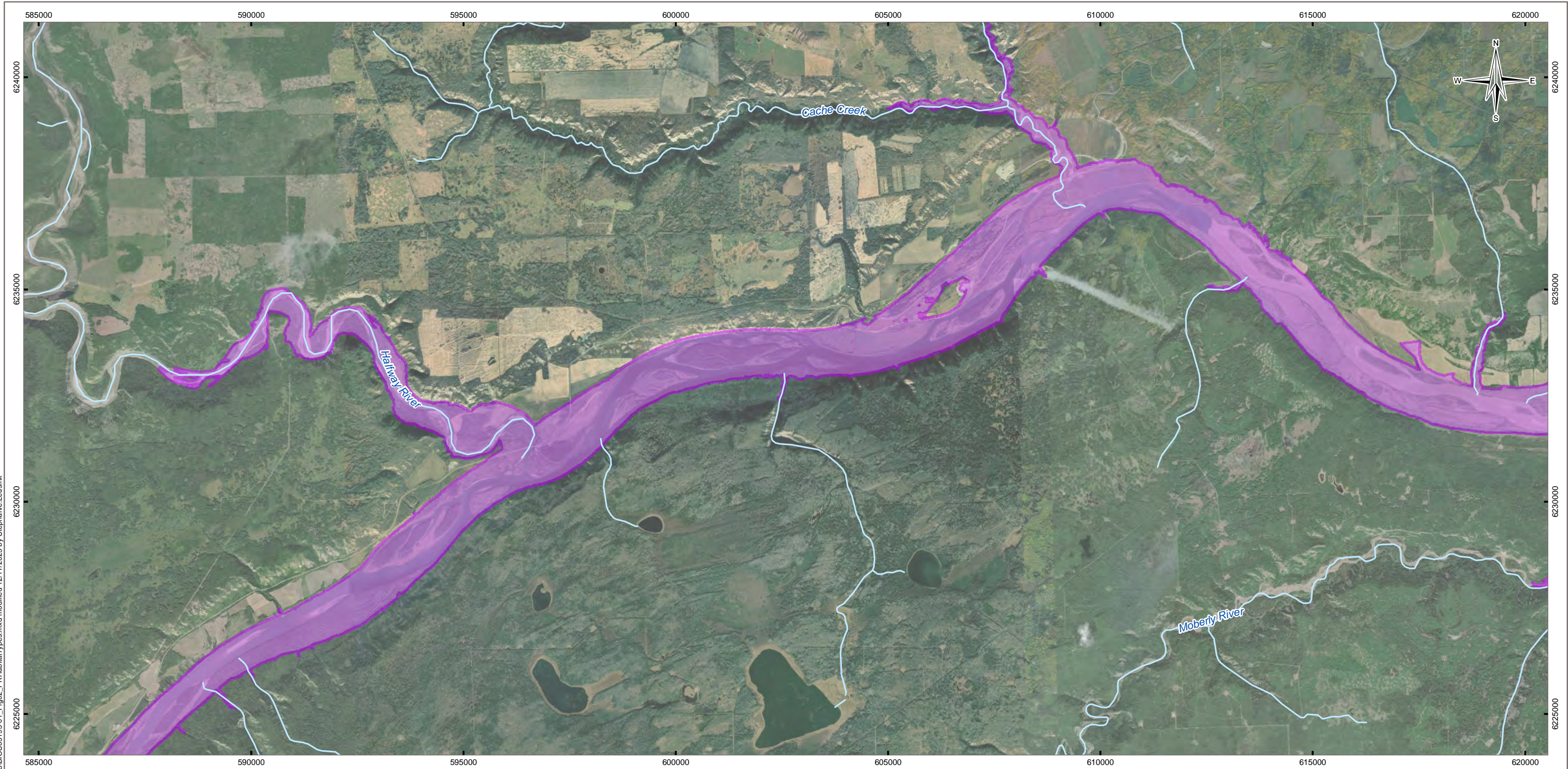
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**SITE C WATERBIRD  
 2025 ANNUAL REPORT**

**Peace River Habitat Types  
 Hudson's Hope to Farrell Creek**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:90,000				
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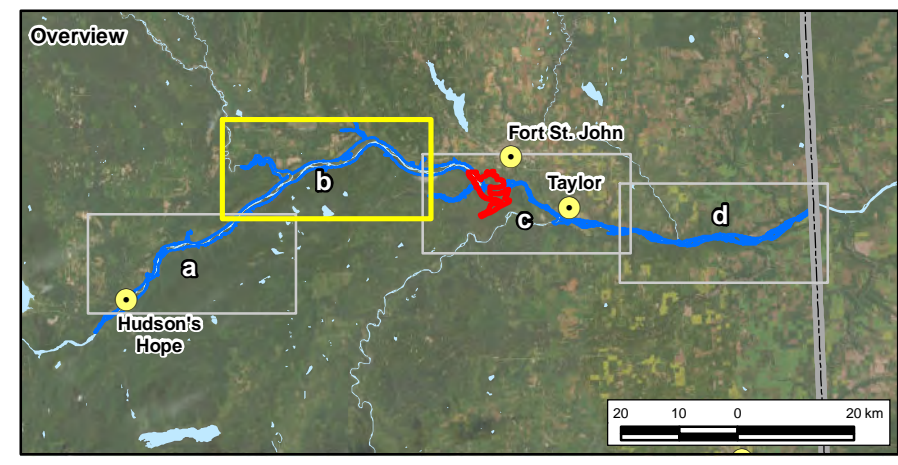
**Figure 2a**



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**LEGEND**

- Watercourse
- Habitat Types**
- Reservoir Level (461.8 metres above sea level)



**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

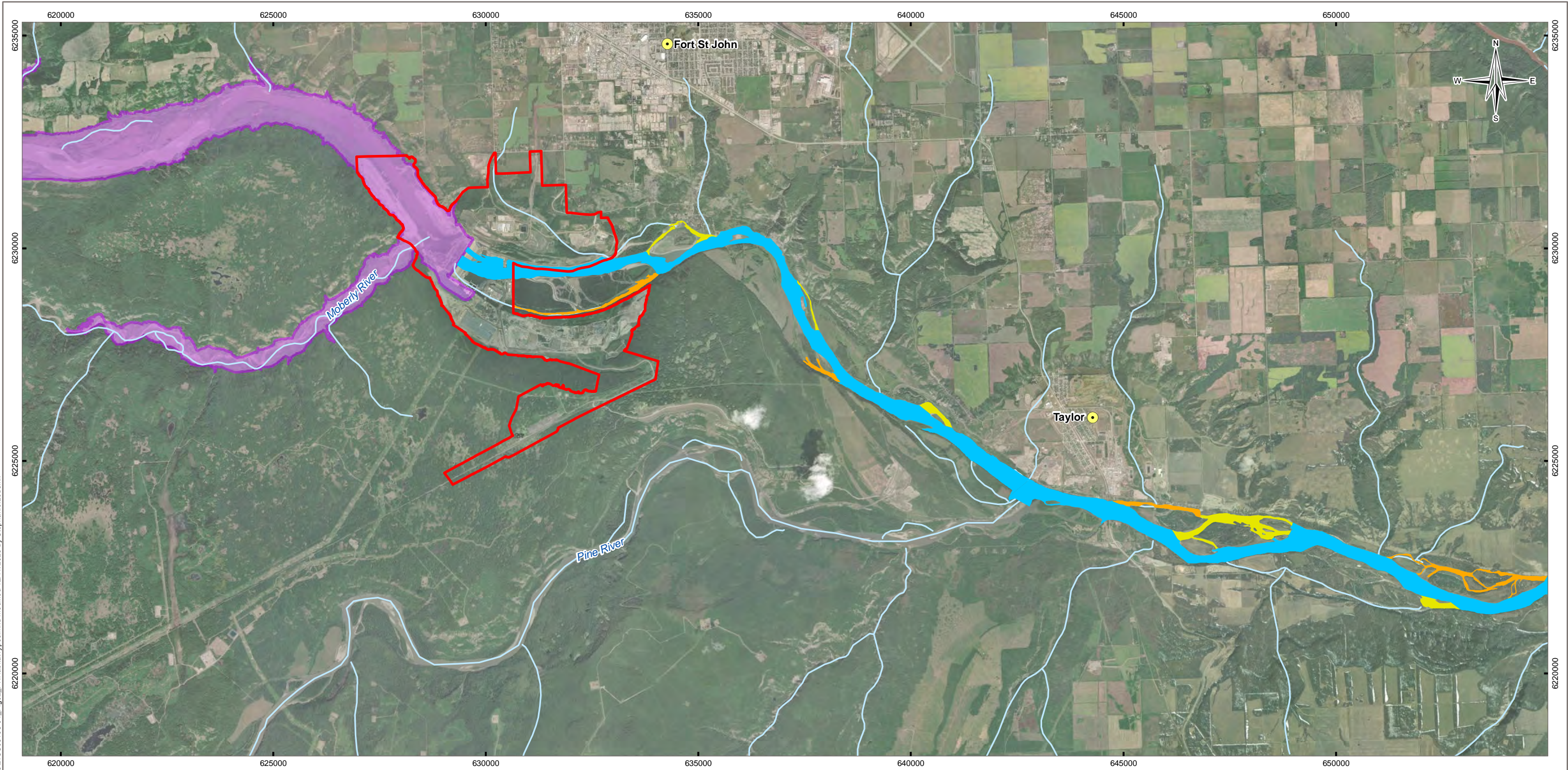
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**SITE C WATERBIRD  
 2025 ANNUAL REPORT**

**Peace River Habitat Types  
 Halfway River to Cache Creek**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:90,000				
				<b>TETRA TECH</b>
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<b>DATE</b> December 17, 2025		<b>PROJECT NO.</b> ENW.BIOS03193-01		

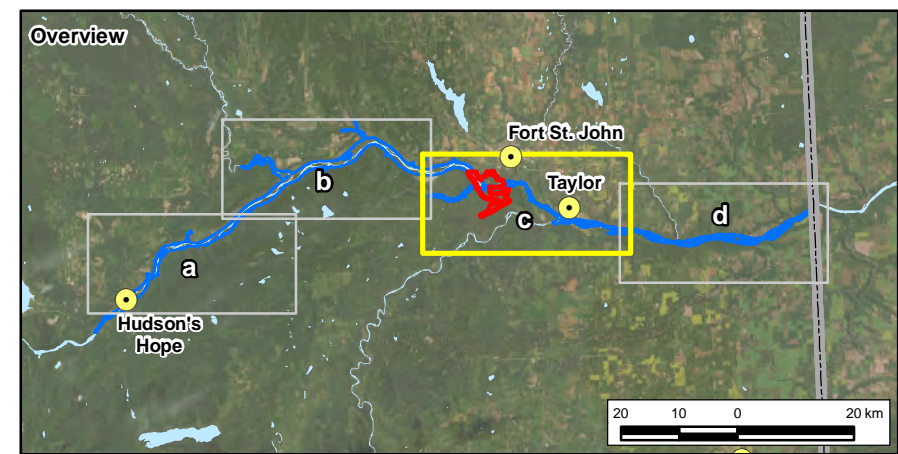
**Figure 2b**



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**LEGEND**

- Populated Place
- Site C Project Boundary
- Watercourse
- Habitat Types**
- Mainstem
- Moderate Flow
- Limited Connectivity
- Reservoir Level (461.8 metres above sea level)

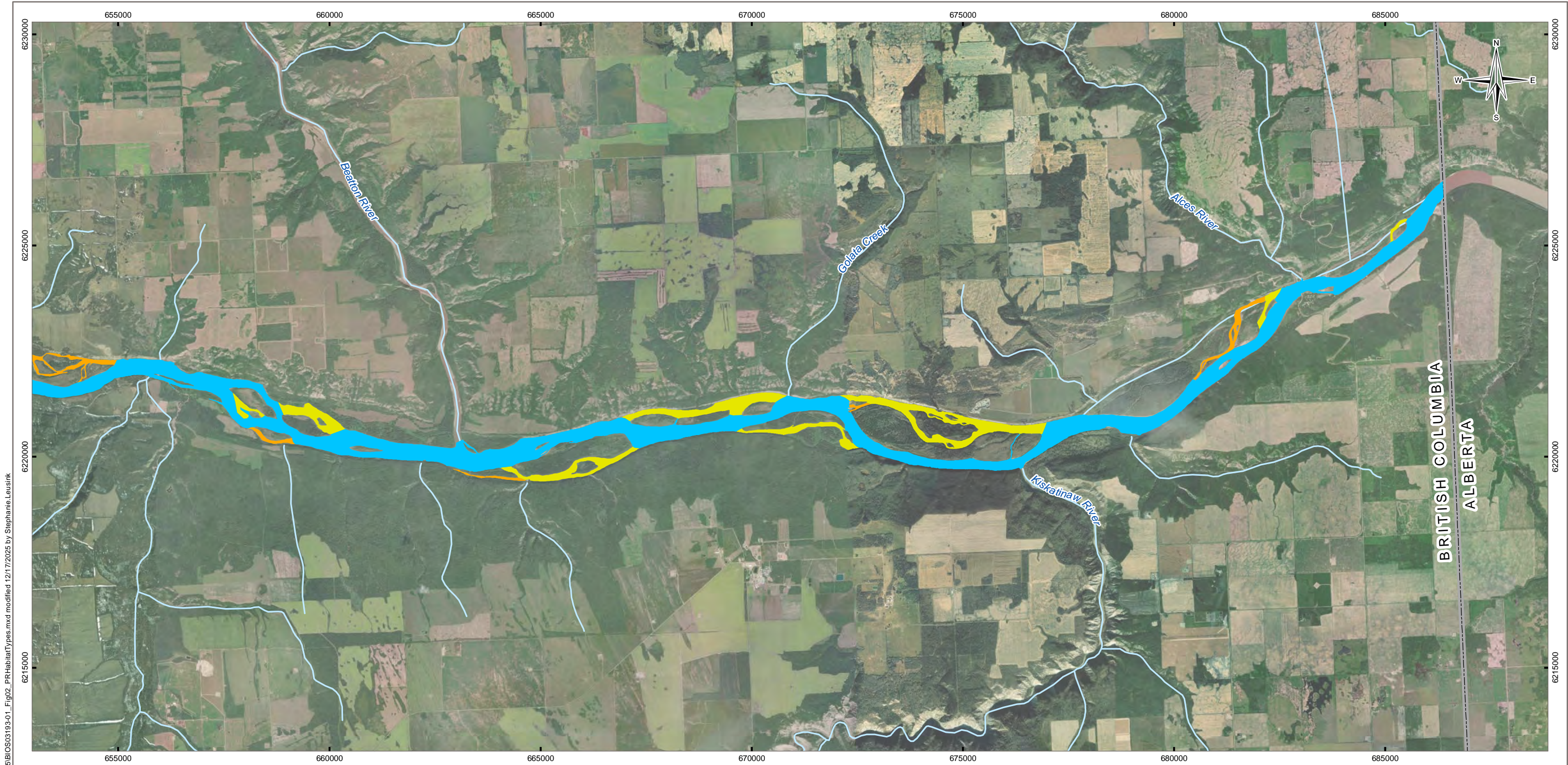


**NOTES**  
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 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

SITE C WATERBIRD 2025 ANNUAL REPORT				
<b>Peace River Habitat Types Moberly River to Taylor</b>				
PROJECTION UTM Zone 10	DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart		
Scale: 1:90,000				
<div style="display: flex; justify-content: space-between; width: 100%;"> <span>1.5</span> <span>0.75</span> <span>0</span> <span>1.5</span> </div> <div style="text-align: center; border-top: 1px solid black; width: 100%;"></div> Kilometres				
FILE NO. BIOS03193-01_Fig02_PRHabitatTypes.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025	PROJECT NO. ENW.BIOS03193-01			
				<b>Figure 2c</b>

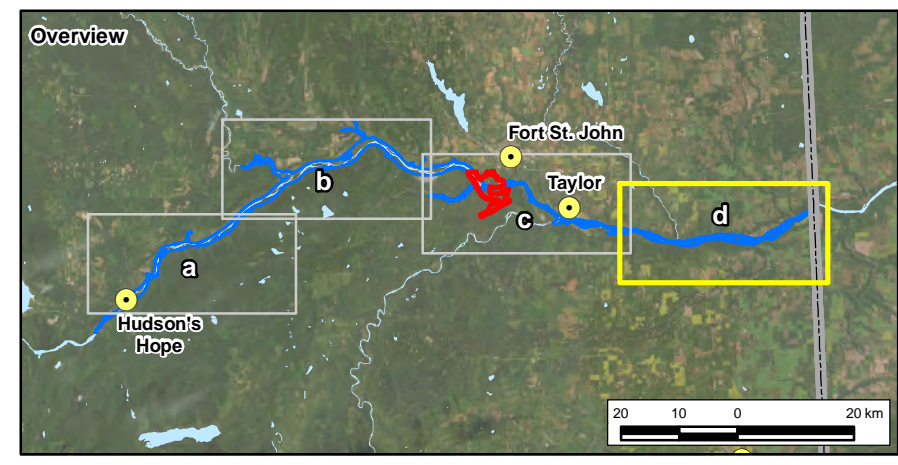




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**LEGEND**

- Provincial Boundary
- Watercourse
- Habitat Types**
- Mainstem
- Moderate Flow
- Limited Connectivity



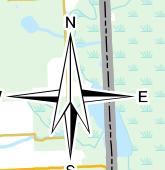
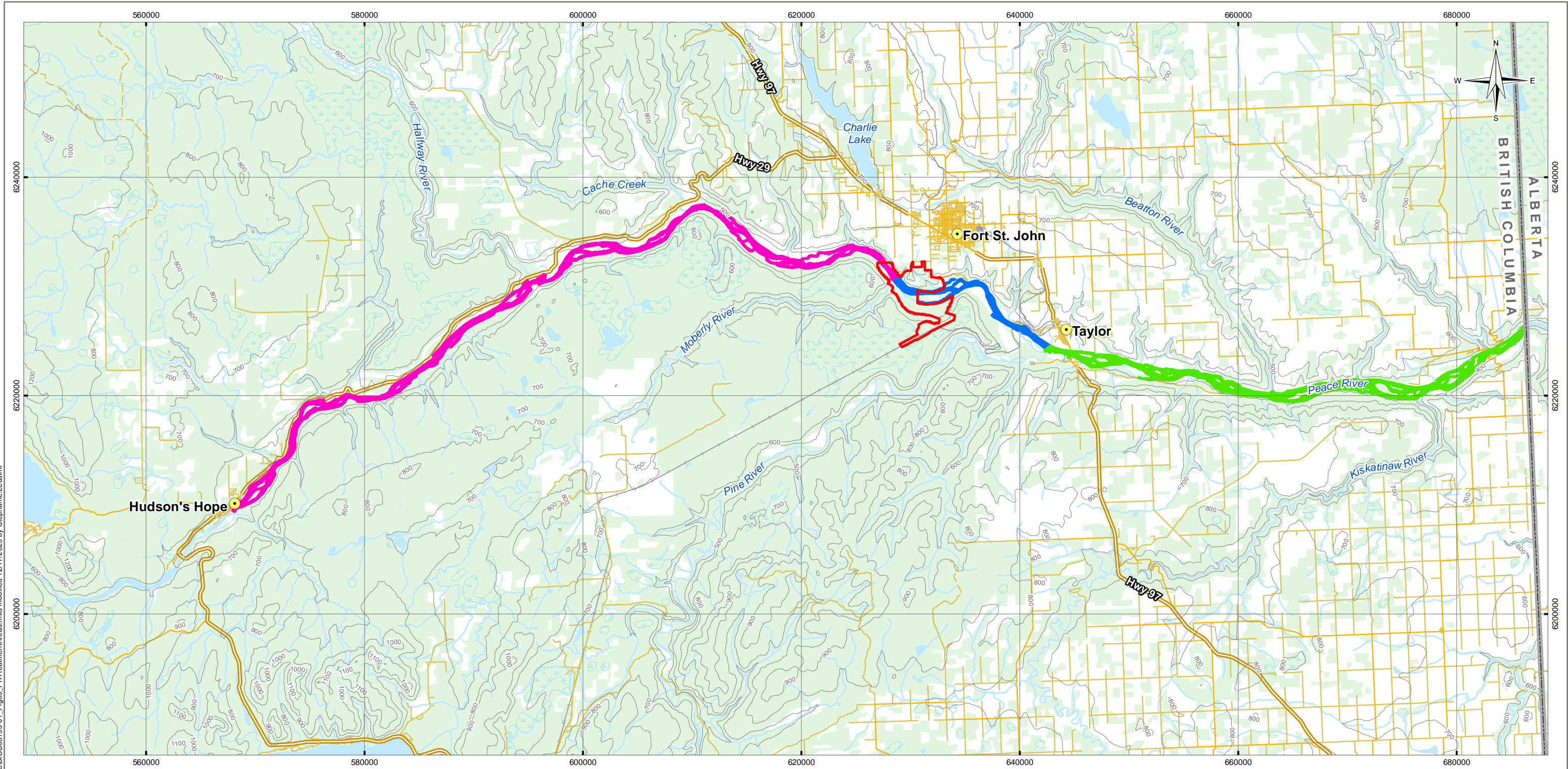
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 Base data source:  
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 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

**SITE C WATERBIRD  
 2025 ANNUAL REPORT**

**Peace River Habitat Types  
 Beatton River to Alberta Border**

<b>PROJECTION</b> UTM Zone 10	<b>DATUM</b> NAD83	<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:90,000  Kilometres		<b>TETRA TECH</b>
<b>FILE NO.</b> BIOS03193-01_Fig02_PRHabitatTypes.mxd		
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<b>DATE</b> December 17, 2025	<b>APVD</b> ZO	<b>REV</b> 0
<b>PROJECT NO.</b> ENW.BIOS03193-01		<b>Figure 2d</b>



BRITISH COLUMBIA  
ALBERTA

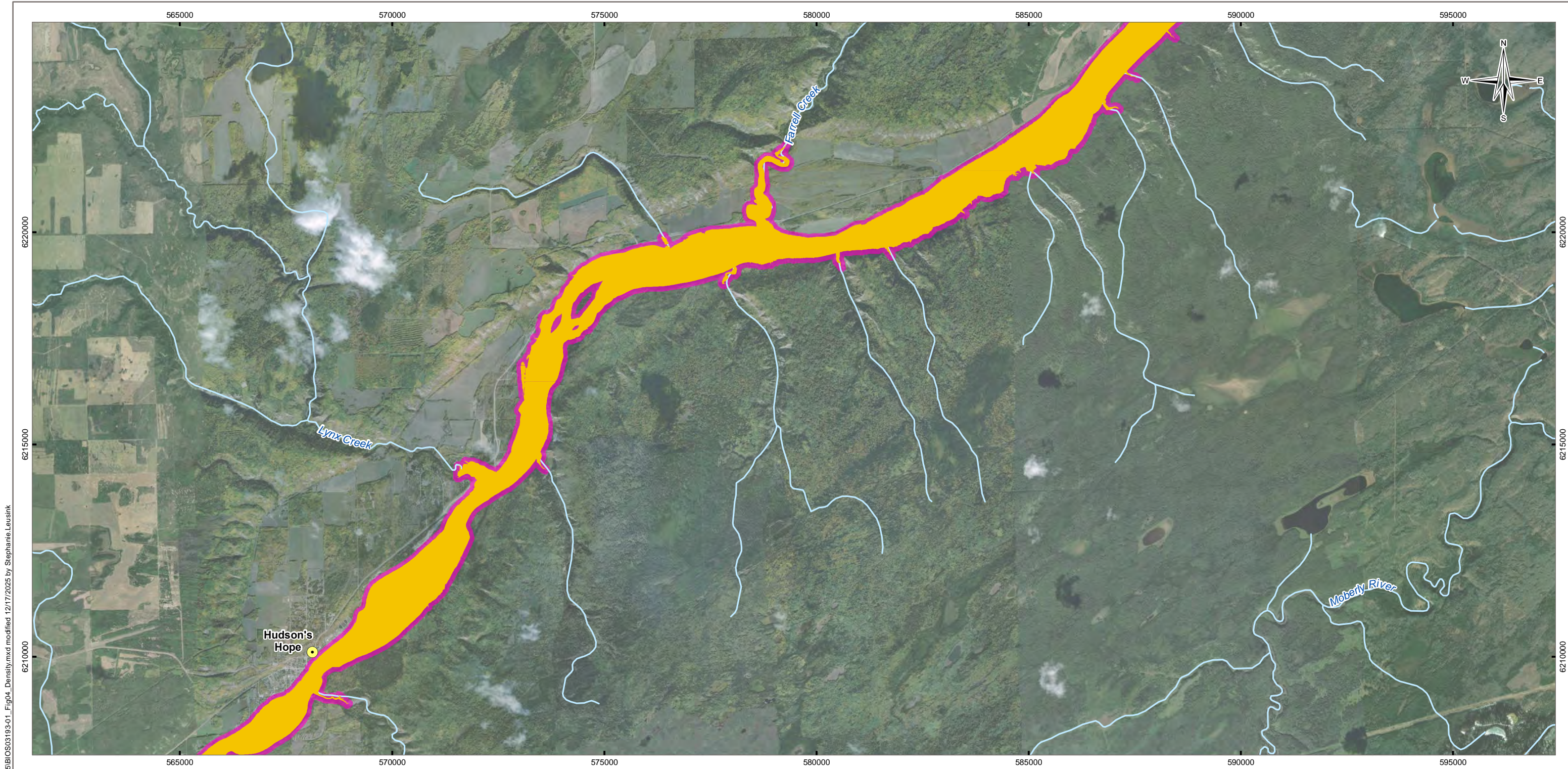
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<b>LEGEND</b>		
Site C Project Boundary	Populated Place	Contour (100 m)
<b>Treatment Areas</b>		
Control Area	Highway	Watercourse
Flow Regime Impact Area	Main Road	Waterbody
Inundation Impact Area	Local Road	Wetland
	Resource/Recreational Road	Wooded Area
	Railway	Provincial Boundary
	Residential Area	

**NOTES**  
Base data source: CanVec 1:250,000.

SITE C WATERBIRD 2025 ANNUAL REPORT			
Peace River Treatment Areas			
PROJECTION UTM Zone 10	DATUM NAD83	CLIENT BC Hydro Power smart	
Scale: 1:350,000			
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OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO
DATE December 17, 2025	PROJECT NO. ENW.BIOS03193-01		
<b>Figure 3</b>			

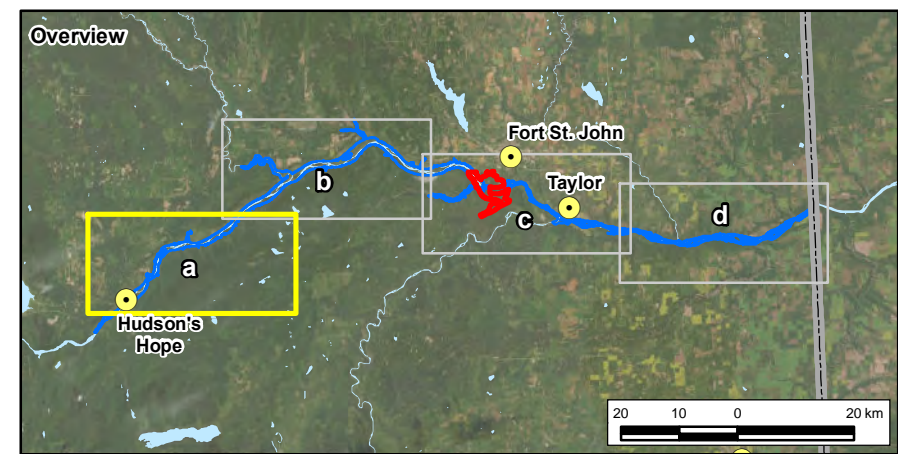
**STATUS**  
ISSUED FOR USE



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**LEGEND**

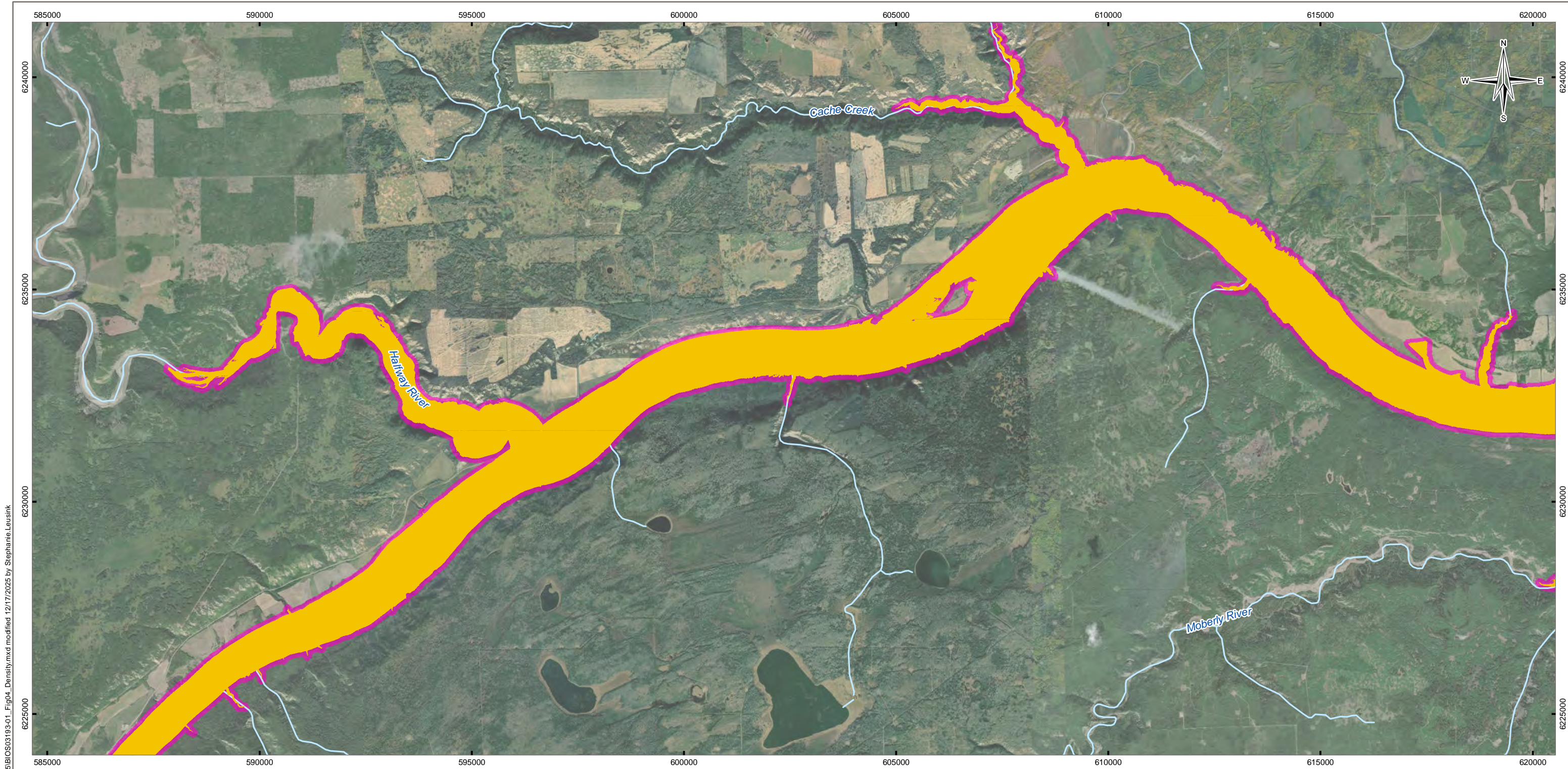
- Populated Place
  - ~ Watercourse
  - Treatment Areas**
  - Inundation Impact Area
- | Mean Density (Birds/km <sup>2</sup> /Survey Round) |   |
|--|---|
| 0 - 0.10   | <span style="display: inline-block; width: 15px; height: 10px; background-color: yellow;"></span>       |
| 0.11 - 0.20  | <span style="display: inline-block; width: 15px; height: 10px; background-color: orangeyellow;"></span> |
| 0.21 - 0.30  | <span style="display: inline-block; width: 15px; height: 10px; background-color: orange;"></span>       |
| 0.31 - 0.40  | <span style="display: inline-block; width: 15px; height: 10px; background-color: darkorange;"></span>   |
| 0.41 - 0.50  | <span style="display: inline-block; width: 15px; height: 10px; background-color: red;"></span>          |
| > 0.50   | <span style="display: inline-block; width: 15px; height: 10px; background-color: darkred;"></span>      |
| Not Surveyed                                       | <span style="display: inline-block; width: 15px; height: 10px; background-color: lightgrey;"></span>    |



**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

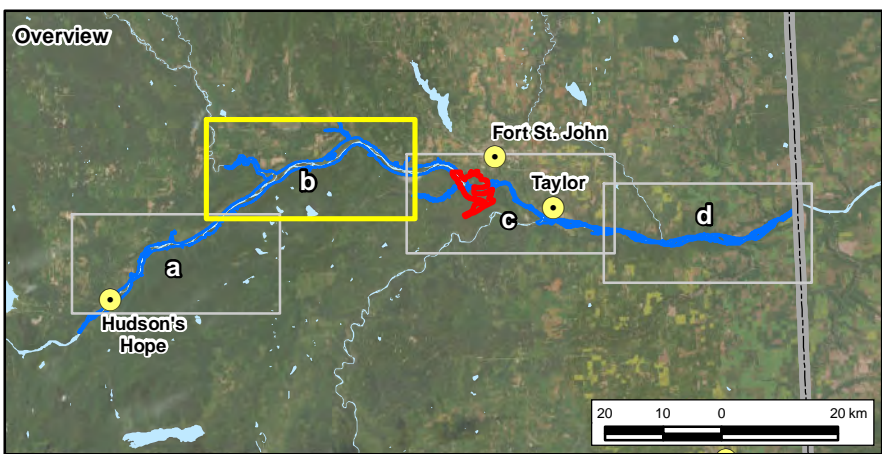
SITE C WATERBIRD 2025 ANNUAL REPORT				
<b>Mean Density by Peace River Treatment Areas Hudson's Hope to Farrell Creek</b>				
PROJECTION UTM Zone 10	DATUM NAD83		CLIENT <b>BC Hydro</b> Power smart	
Scale: 1:90,000				
<div style="display: flex; justify-content: space-between; width: 100%;"> <span>1.5</span> <span>0.75</span> <span>0</span> <span>1.5</span> </div> <div style="text-align: center; margin-top: 5px;">            Kilometres         </div>				
FILE NO. BIOS03193-01_Fig04_Density.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025	PROJECT NO. ENW.BIOS03193-01			
Figure 4a				



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**LEGEND**

- Watercourse
  - Inundation Impact Area
- Mean Density (Birds/km<sup>2</sup>/Survey Round)**
- 0 - 0.10
  - 0.11 - 0.20
  - 0.21 - 0.30
  - 0.31 - 0.40
  - 0.41 - 0.50
  - > 0.50
  - Not Surveyed

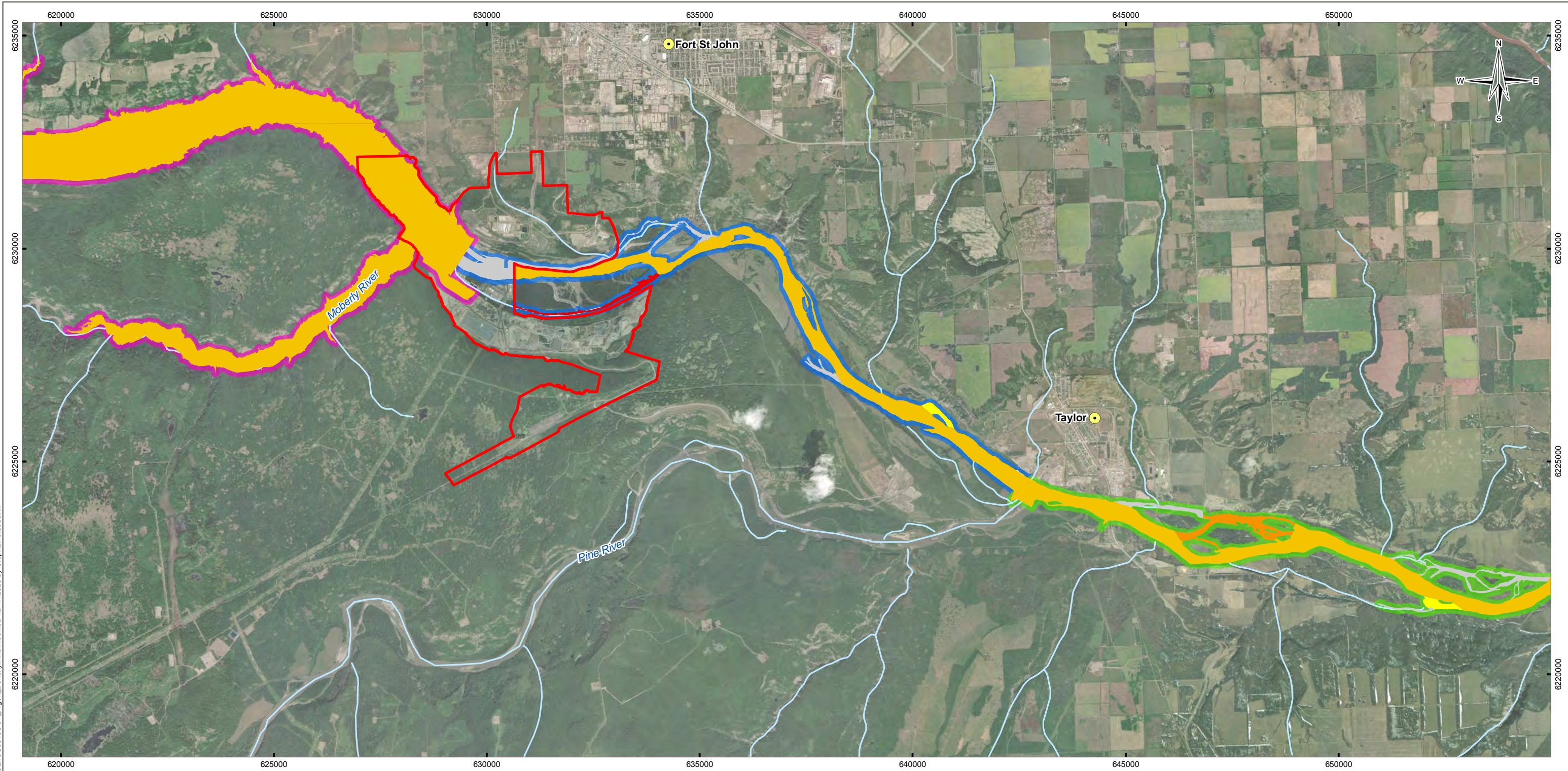


**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

SITE C WATERBIRD 2025 ANNUAL REPORT				
Mean Density by Peace River Treatment Areas Halfway River to Cache Creek				
PROJECTION UTM Zone 10		DATUM NAD83		CLIENT BC Hydro Power smart
Scale: 1:90,000				
FILE NO. BIOS03193-01_Fig04_Density.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025	PROJECT NO. ENW.BIOS03193-01			
				<b>Figure 4b</b>

TETRA TECH



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**LEGEND**

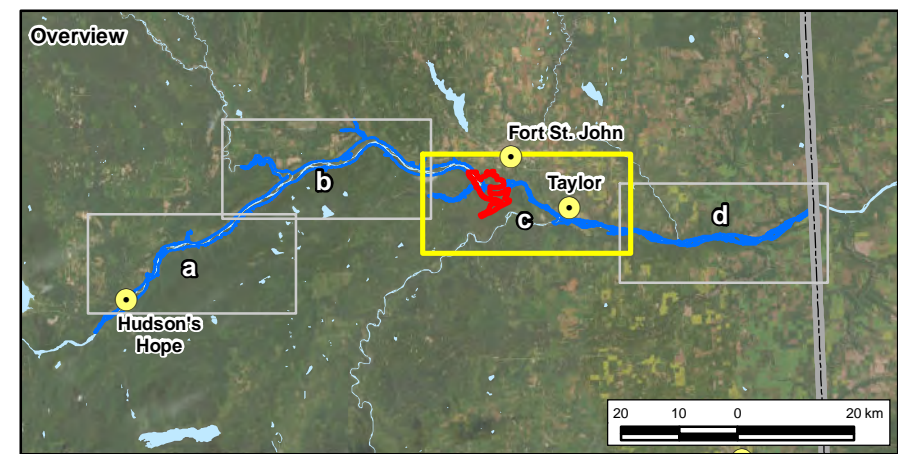
- Populated Place
- Site C Project Boundary
- ~ Watercourse

**Treatment Areas**

- Control Area
- Flow Regime Impact Area
- Inundation Impact Area

**Mean Density (Birds/km<sup>2</sup>/Survey Round)**

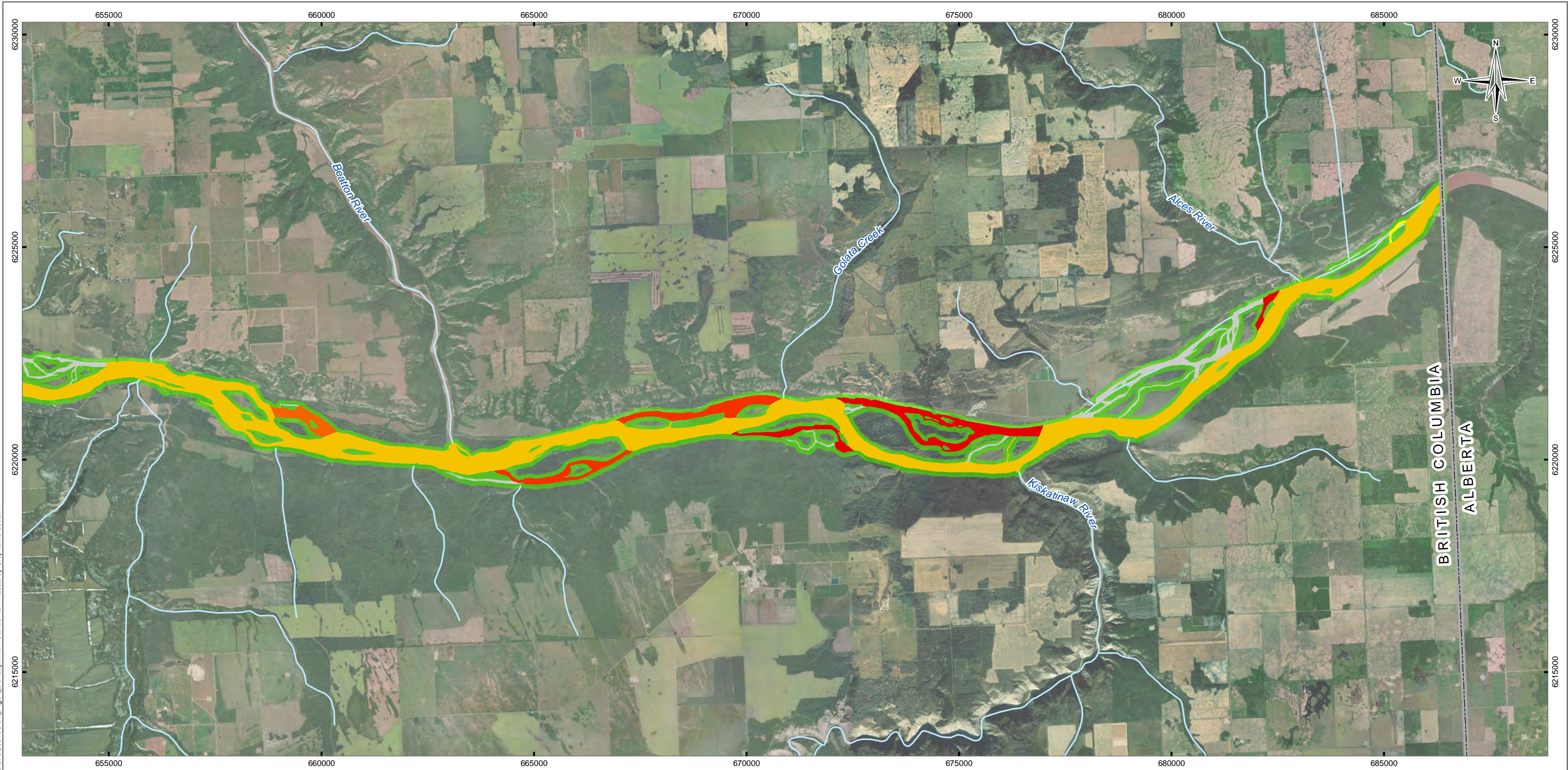
- 0 - 0.10
- 0.11 - 0.20
- 0.21 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- > 0.50
- Not Surveyed



**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

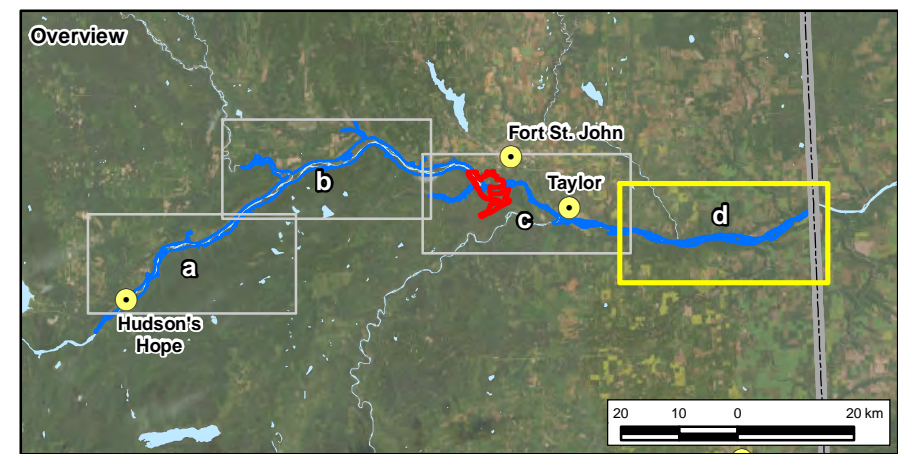
SITE C WATERBIRD 2025 ANNUAL REPORT				
Mean Density by Peace River Treatment Areas Moberly River to Taylor				
PROJECTION UTM Zone 10			DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart
Scale: 1:90,000				
FILE NO. BIOS03193-01_Fig04_Density.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025		PROJECT NO. ENW.BIOS03193-01		
Figure 4c				



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**LEGEND**

Provincial Boundary	<b>Mean Density (Birds/km<sup>2</sup>/Survey Round)</b>
Watercourse	0 - 0.10
<b>Treatment Areas</b>	0.11 - 0.20
Control Area	0.21 - 0.30
	0.31 - 0.40
	0.41 - 0.50
	> 0.50
	Not Surveyed

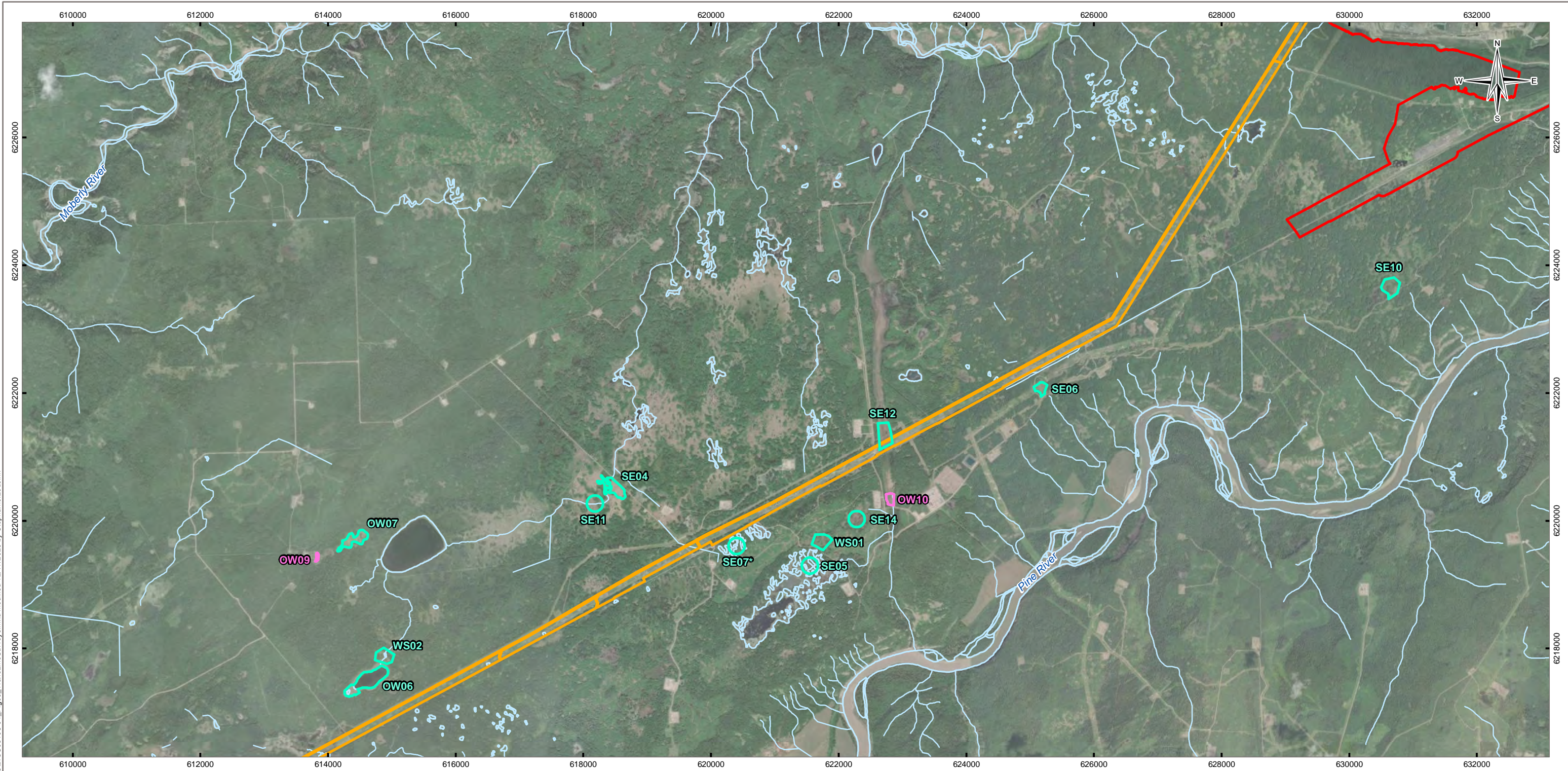


**NOTES**  
 Base data source:  
 CanVec 1:250,000 (2019)  
 Imagery from ESRI; Vantor

**STATUS**  
 ISSUED FOR USE

SITE C WATERBIRD 2025 ANNUAL REPORT				
Mean Density by Peace River Treatment Areas Beaton River to Alberta Border				
PROJECTION UTM Zone 10	DATUM NAD83		CLIENT BC Hydro Power smart	
Scale: 1:90,000				
FILE NO. BIOS03193-01_Fig04_Density.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025	PROJECT NO. ENW.BIOS03193-01			
				<b>Figure 4d</b>

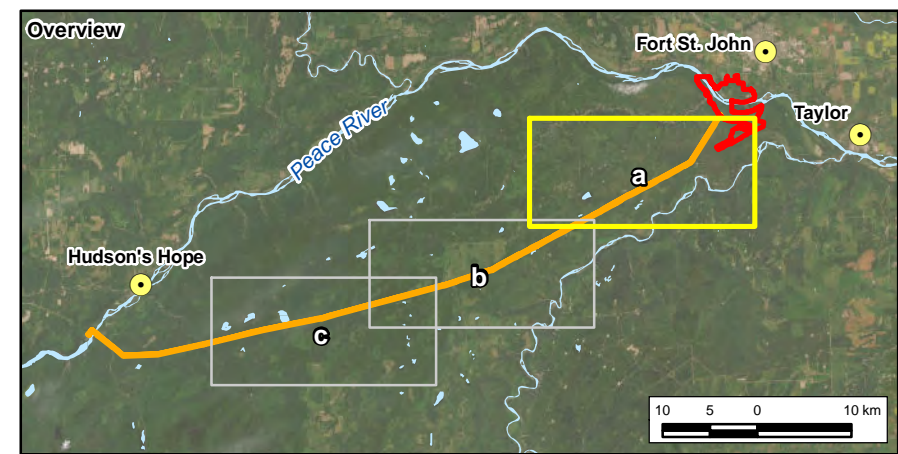
TETRA TECH



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**LEGEND**

- Transmission Line Corridor
- Site C Project Boundary
- ~ Watercourse/Waterbody
- 2025 Surveyed Wetlands**
- Surveyed
- Not Surveyed



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

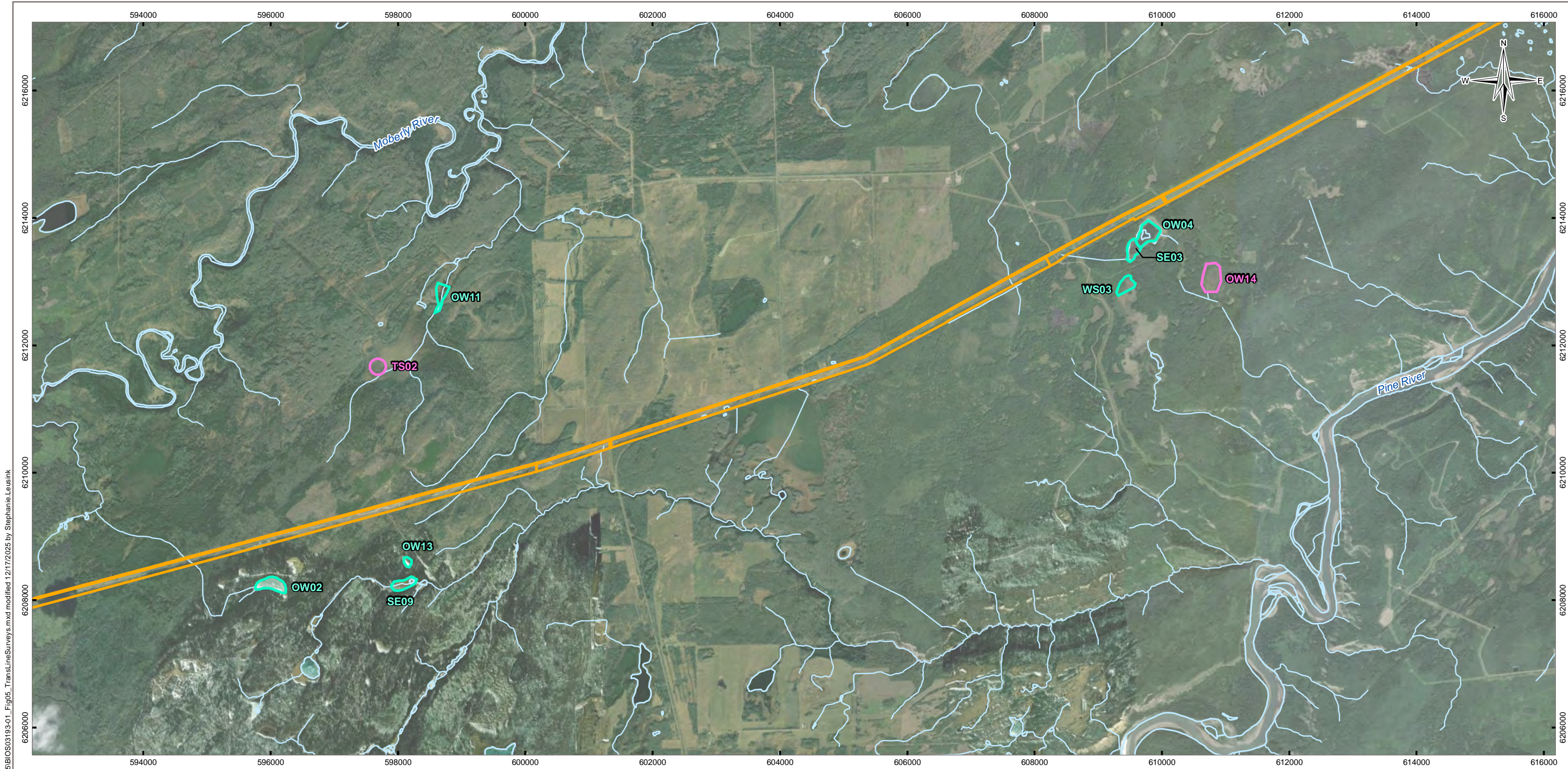
**STATUS**  
 ISSUED FOR USE

**SITE C WATERBIRD  
 2025 ANNUAL REPORT**

**Transmission Line Wetlands  
 Surveyed in 2025 - Eastern Portion**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> <b>BC Hydro</b> Power smart	
Scale: 1:60,000					
<b>FILE NO.</b> BIOS03193-01_Fig05_TransLineSurveys.mxd					
<b>OFFICE</b> Tt-VANC	<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> ZO	<b>REV</b> 0	<b>Figure 5a</b>
<b>DATE</b> December 17, 2025		<b>PROJECT NO.</b> ENW.BIOS03193-01			

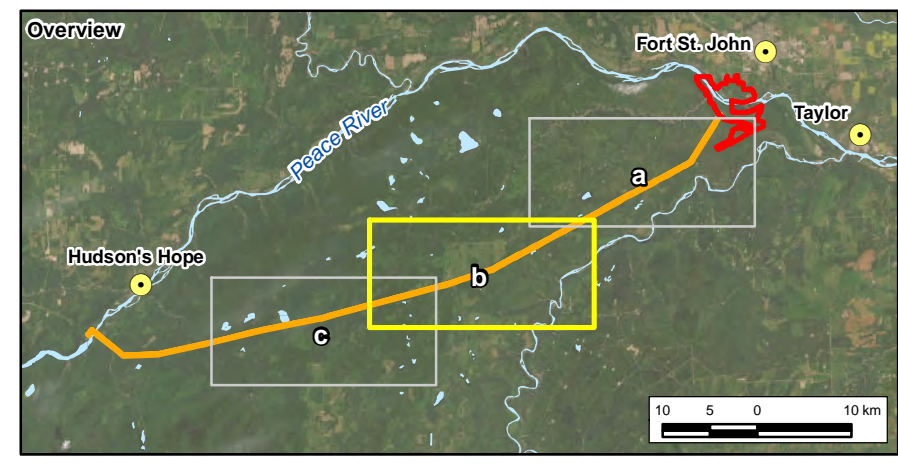




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**LEGEND**

- Transmission Line Corridor
- ~ Watercourse/Waterbody
- 2025 Surveyed Wetlands**
- Surveyed
- Not Surveyed



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

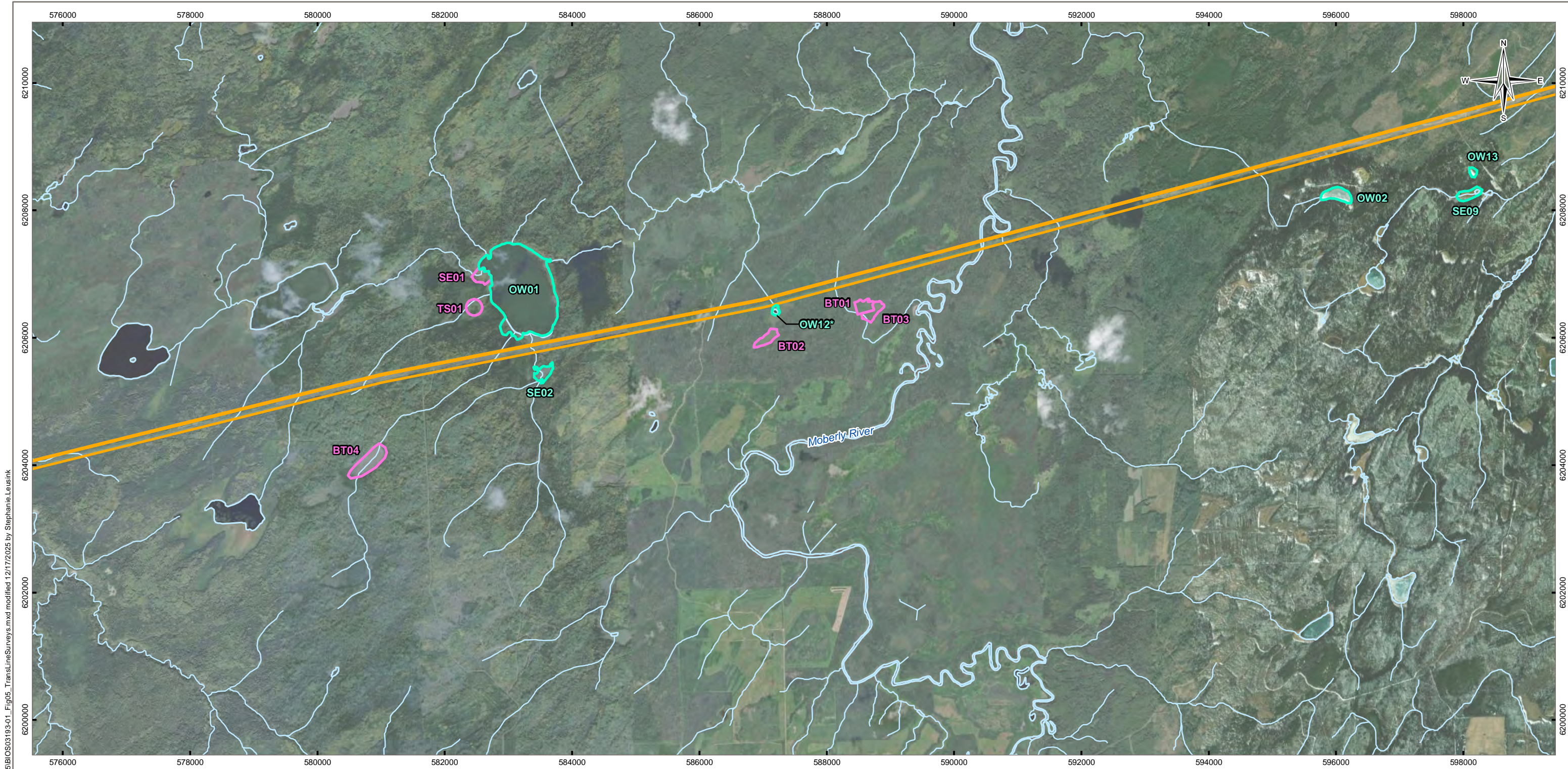
**STATUS**  
 ISSUED FOR USE

**SITE C WATERBIRD  
 2025 ANNUAL REPORT**

**Transmission Line Wetlands  
 Surveyed in 2025 - Central Portion**

<b>PROJECTION</b> UTM Zone 10	<b>DATUM</b> NAD83	<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:60,000  Kilometres		
<b>FILE NO.</b> BIOS03193-01_Fig05_TransLineSurveys.mxd		
<b>OFFICE</b> Tl-VANC	<b>DWN</b> SL	<b>CKD</b> MRB
<b>DATE</b> December 17, 2025	<b>APVD</b> ZO	<b>REV</b> 0
<b>PROJECT NO.</b> ENW.BIOS03193-01		<b>Figure 5b</b>

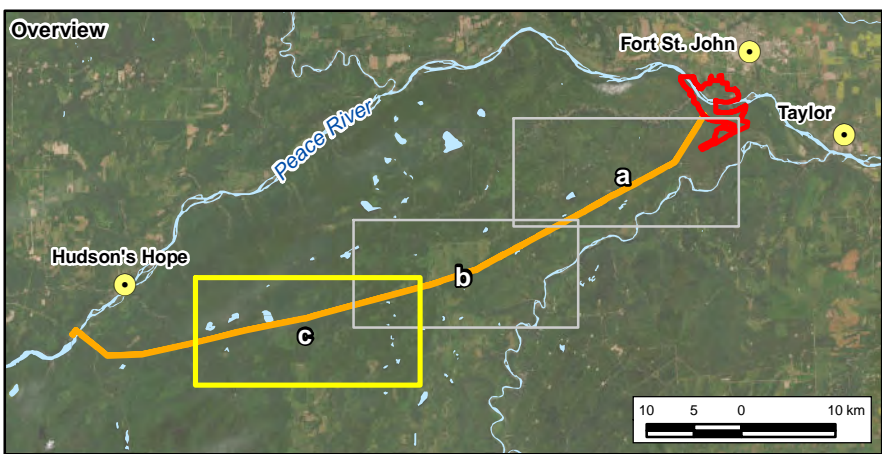




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**LEGEND**

- Transmission Line Corridor
- ~ Watercourse/Waterbody
- 2025 Surveyed Wetlands**
- Surveyed
- Not Surveyed



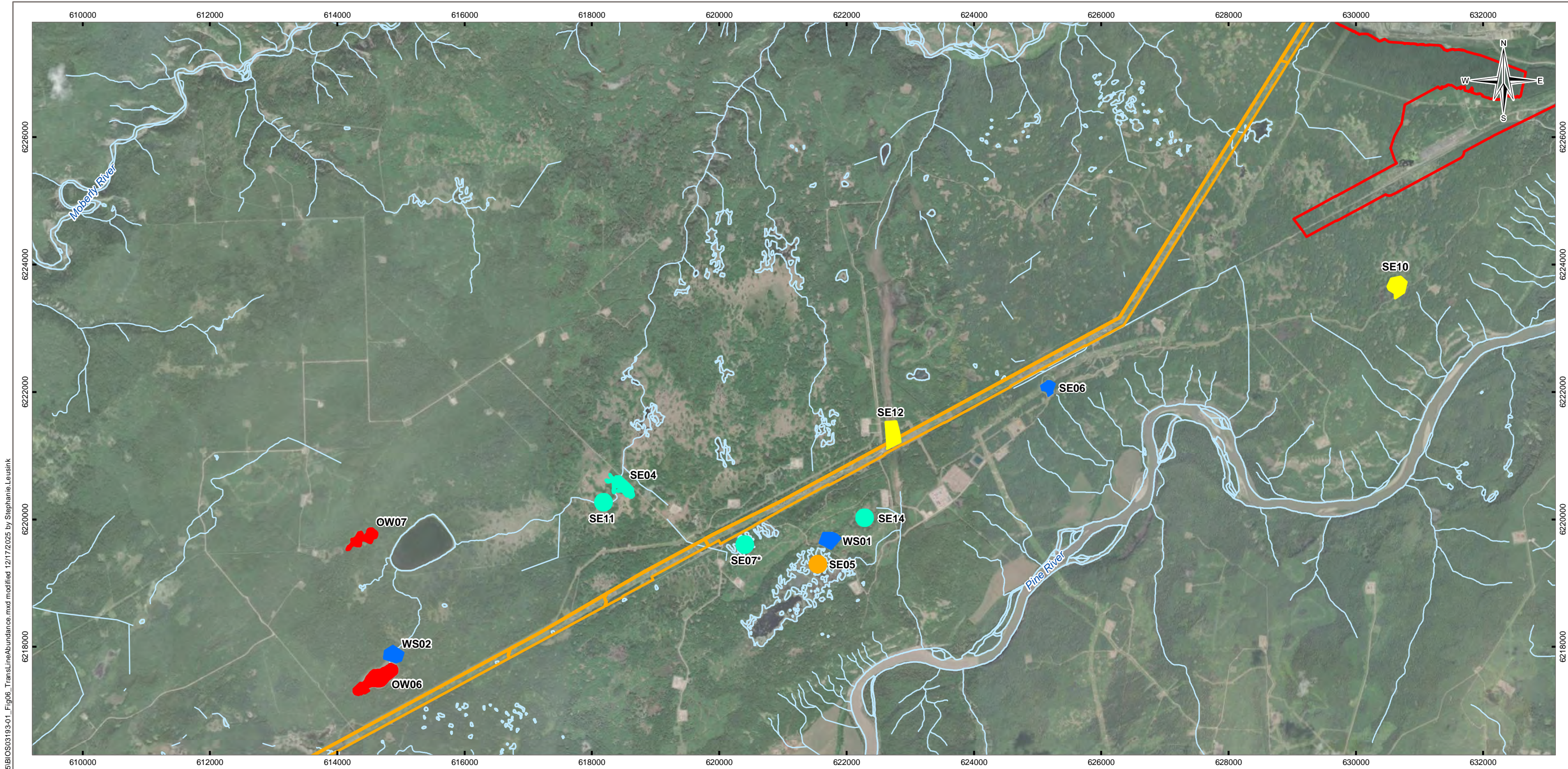
**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

**SITE C WATERBIRD  
2025 ANNUAL REPORT**

**Transmission Line Wetlands  
Surveyed in 2025 - Western Portion**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> BC Hydro Power smart	
Scale: 1:60,000					
<b>FILE NO.</b> BIOS03193-01_Fig05_TransLineSurveys.mxd					
<b>OFFICE</b> Tl-VANC	<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> ZO	<b>REV</b> 0	<b>Figure 5c</b>
<b>DATE</b> December 17, 2025		<b>PROJECT NO.</b> ENW.BIOS03193-01			

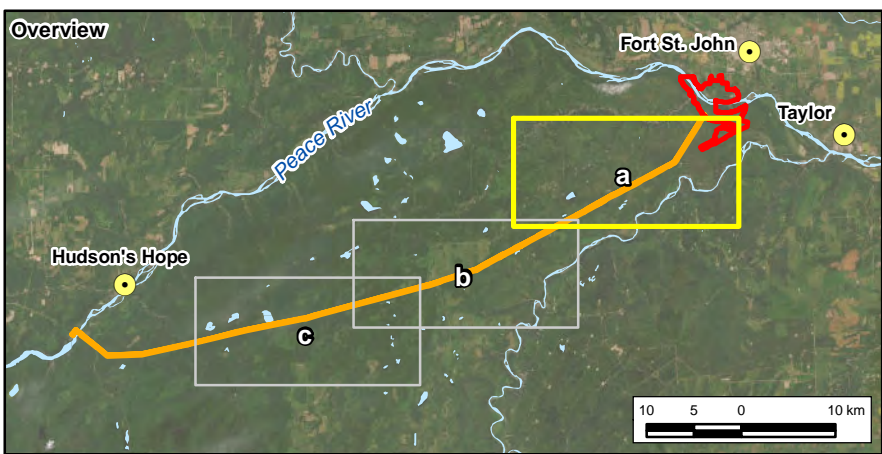
**STATUS**  
ISSUED FOR USE



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**LEGEND**

- Transmission Line Corridor
  - Site C Project Boundary
  - ~~~~~ Watercourse/Waterbody
- Abundance**
- 0
  - 1 - 10
  - 11 - 30
  - 31 - 50
  - 51 - 100
  - > 100



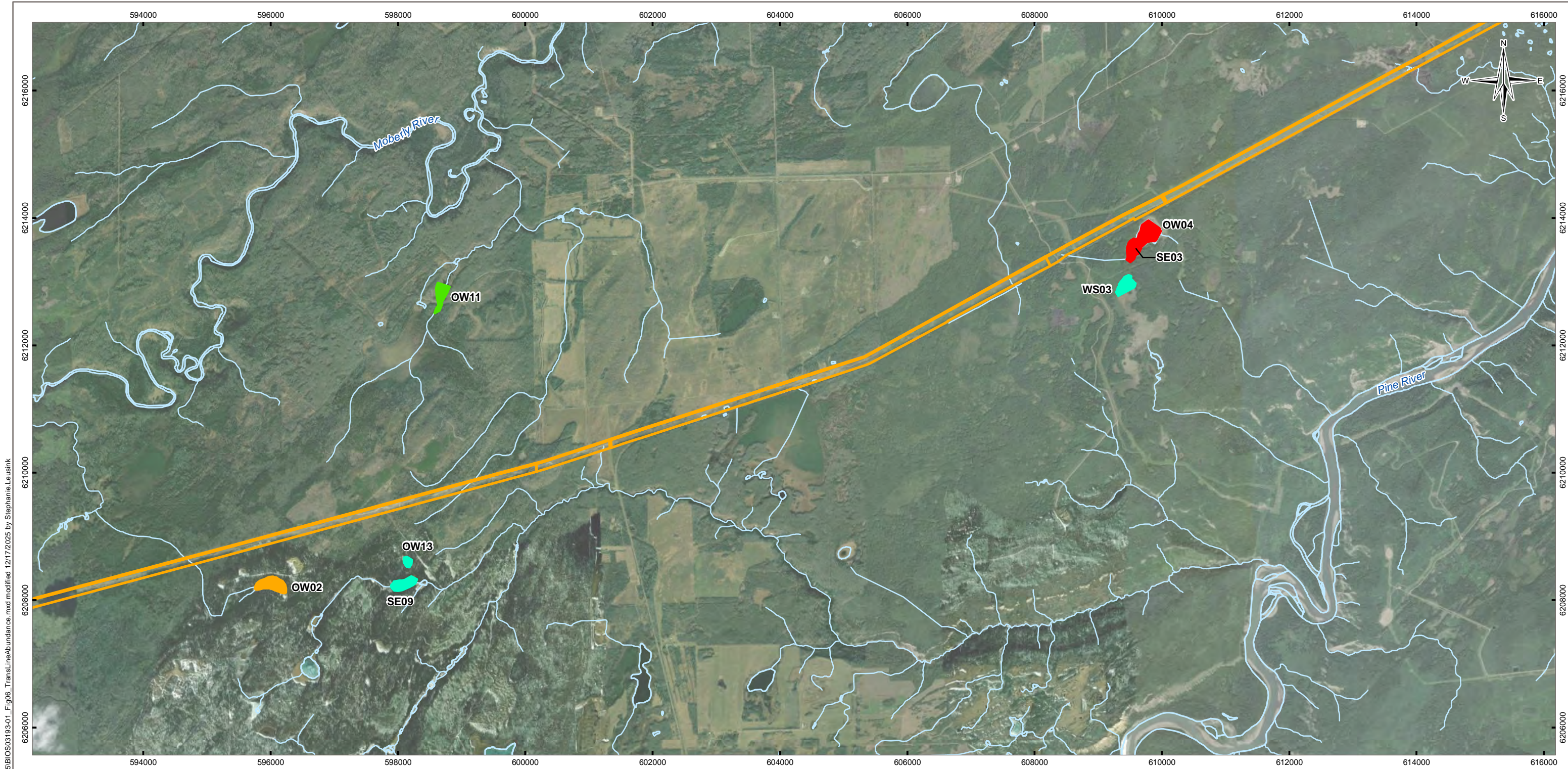
**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

**SITE C WATERBIRD  
2025 ANNUAL REPORT**

**Transmission Line Wetlands  
Total Abundance - Eastern Portion**

PROJECTION UTM Zone 10		DATUM NAD83		CLIENT <b>BC Hydro</b> Power smart	
Scale: 1:60,000					
FILE NO. BIOS03193-01_Fig06_TransLineAbundance.mxd					
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0	<b>Figure 6a</b>
DATE December 17, 2025		PROJECT NO. ENW.BIOS03193-01			

**STATUS**  
ISSUED FOR USE



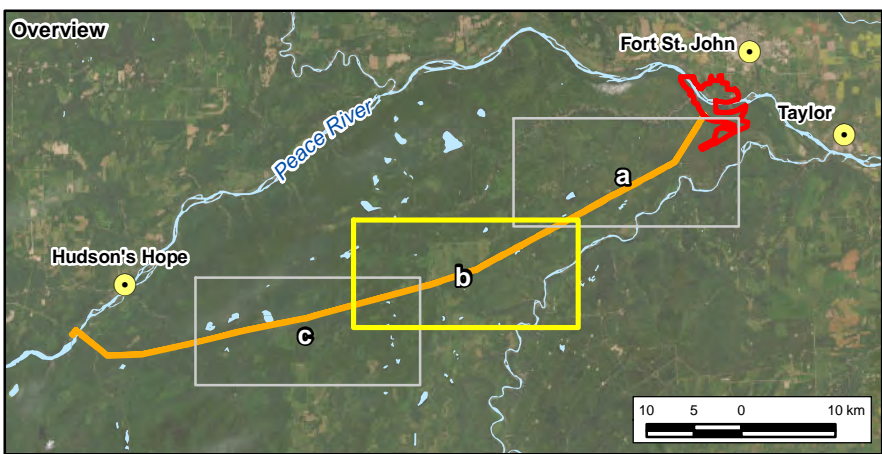
G:\ENVIRONMENTAL\BIOS\03193-01\GIS\Maps\WATERBIRD\_2025\BIOS03193-01\_Fig06\_TransLineAbundance.mxd modified 12/17/2025 by Stephanie Levisink

**LEGEND**

- Transmission Line Corridor
- ~ Watercourse/Waterbody

**Abundance**

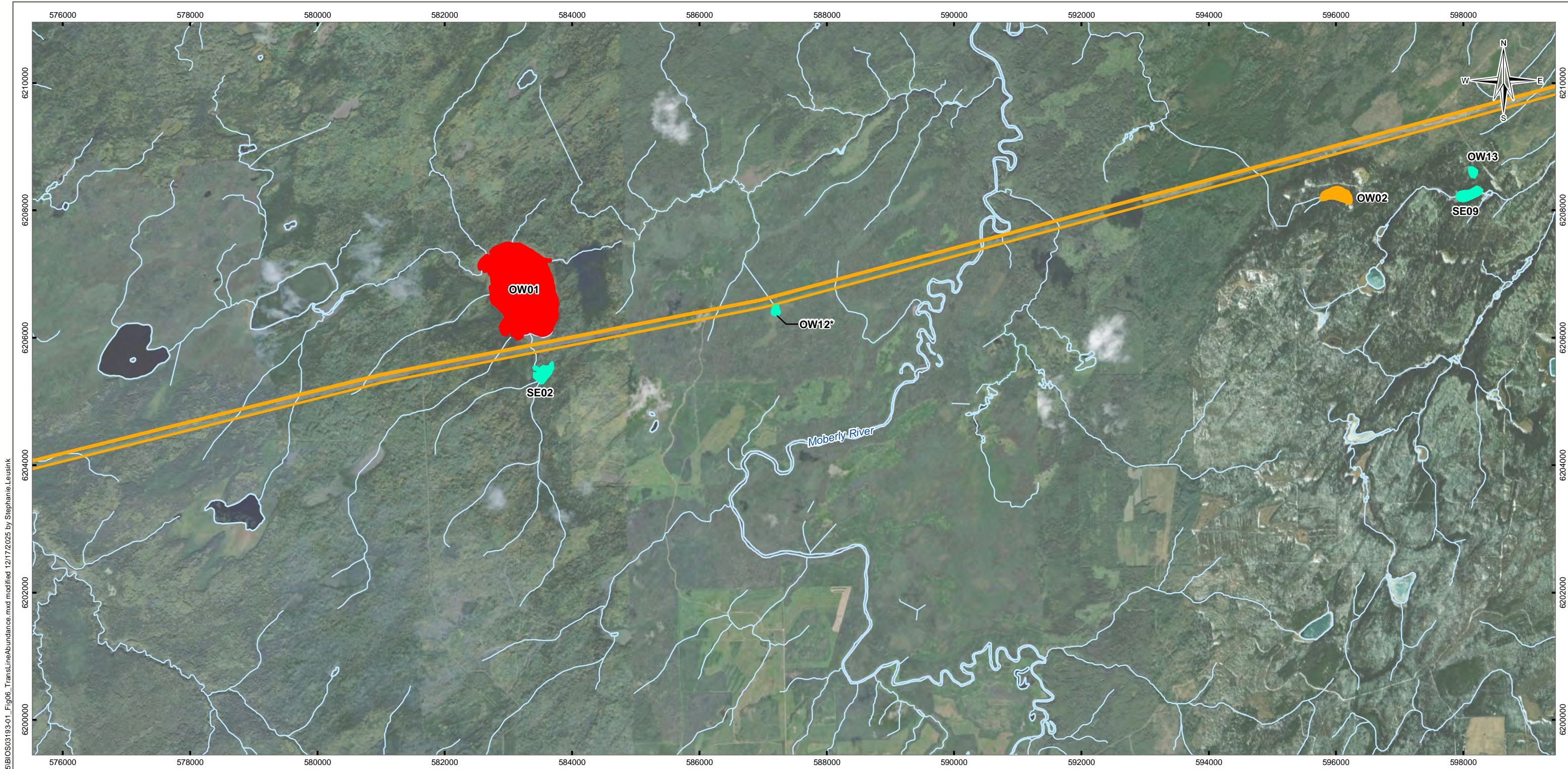
- 0
- 1 - 10
- 11 - 30
- 31 - 50
- 51 - 100
- > 100



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

SITE C WATERBIRD 2025 ANNUAL REPORT				
Transmission Line Wetlands Total Abundance - Central Portion				
PROJECTION UTM Zone 10			DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart
Scale: 1:60,000				
FILE NO. BIOS03193-01_Fig06_TransLineAbundance.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025		PROJECT NO. ENW.BIOS03193-01		
Figure 6b				

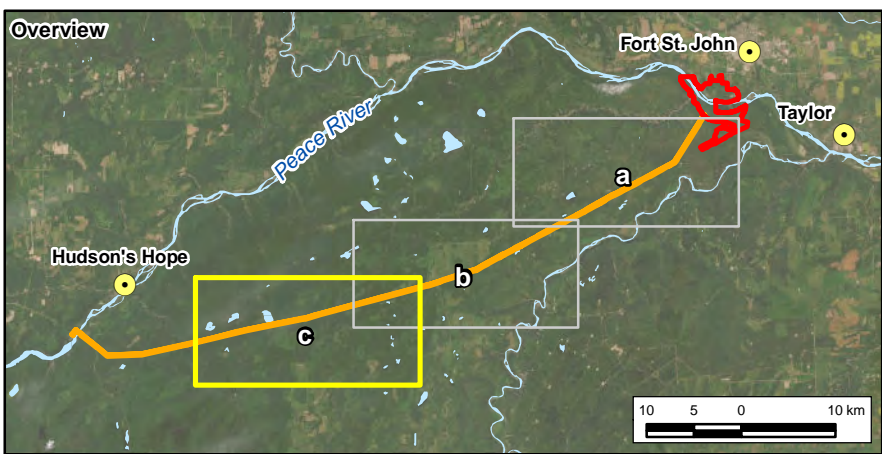
**STATUS**  
ISSUED FOR USE



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**LEGEND**

- Transmission Line Corridor
- ~ Watercourse/Waterbody
- Abundance**
- 0
- 1 - 10
- 11 - 30
- 31 - 50
- 51 - 100
- > 100



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

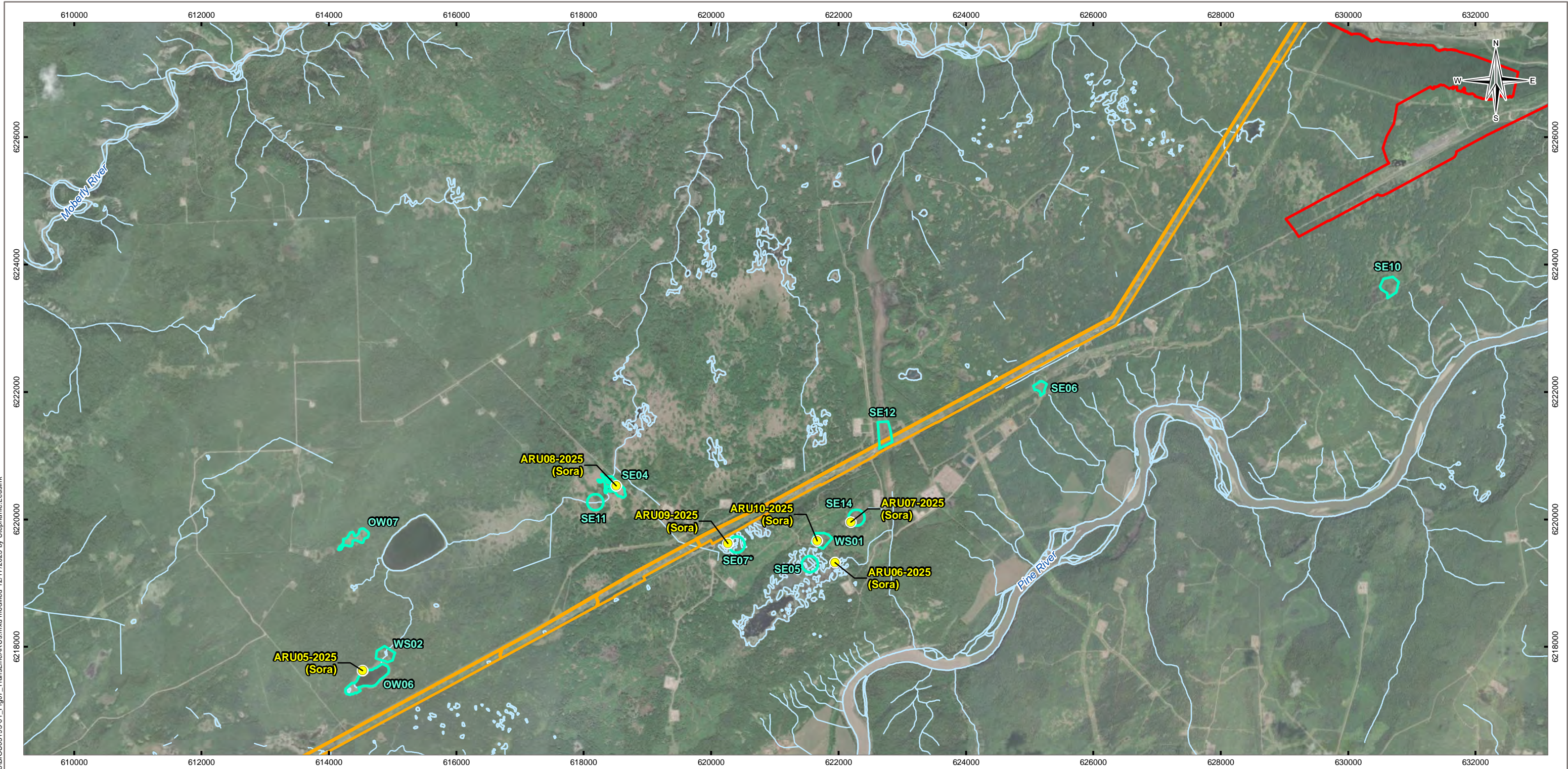
**SITE C WATERBIRD  
2025 ANNUAL REPORT**

**Transmission Line Wetlands  
Total Abundance - Western Portion**

<b>PROJECTION</b> UTM Zone 10		<b>DATUM</b> NAD83		<b>CLIENT</b> <b>BC Hydro</b> Power smart	
Scale: 1:60,000					
				<b>TETRA TECH</b>	
<b>FILE NO.</b> BIOS03193-01_Fig06_TransLineAbundance.mxd					
<b>OFFICE</b> Tl-VANC		<b>DWN</b> SL	<b>CKD</b> MRB	<b>APVD</b> ZO	<b>REV</b> 0
<b>DATE</b> December 17, 2025		<b>PROJECT NO.</b> ENW.BIOS03193-01			

**Figure 6c**

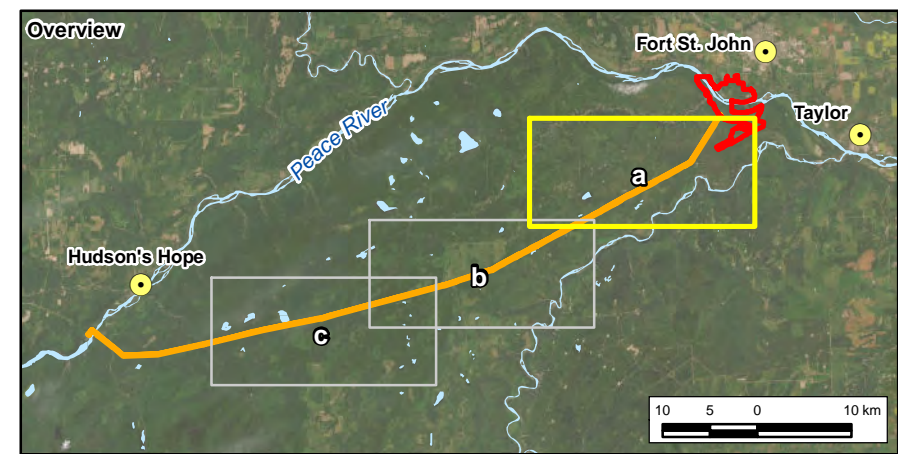
**STATUS**  
ISSUED FOR USE



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**LEGEND**

- 2025 ARU Location (Key Species Detected)
- Transmission Line Corridor
- Site C Project Boundary
- ~ Watercourse/Waterbody
- 2025 Surveyed Wetlands**
- Surveyed



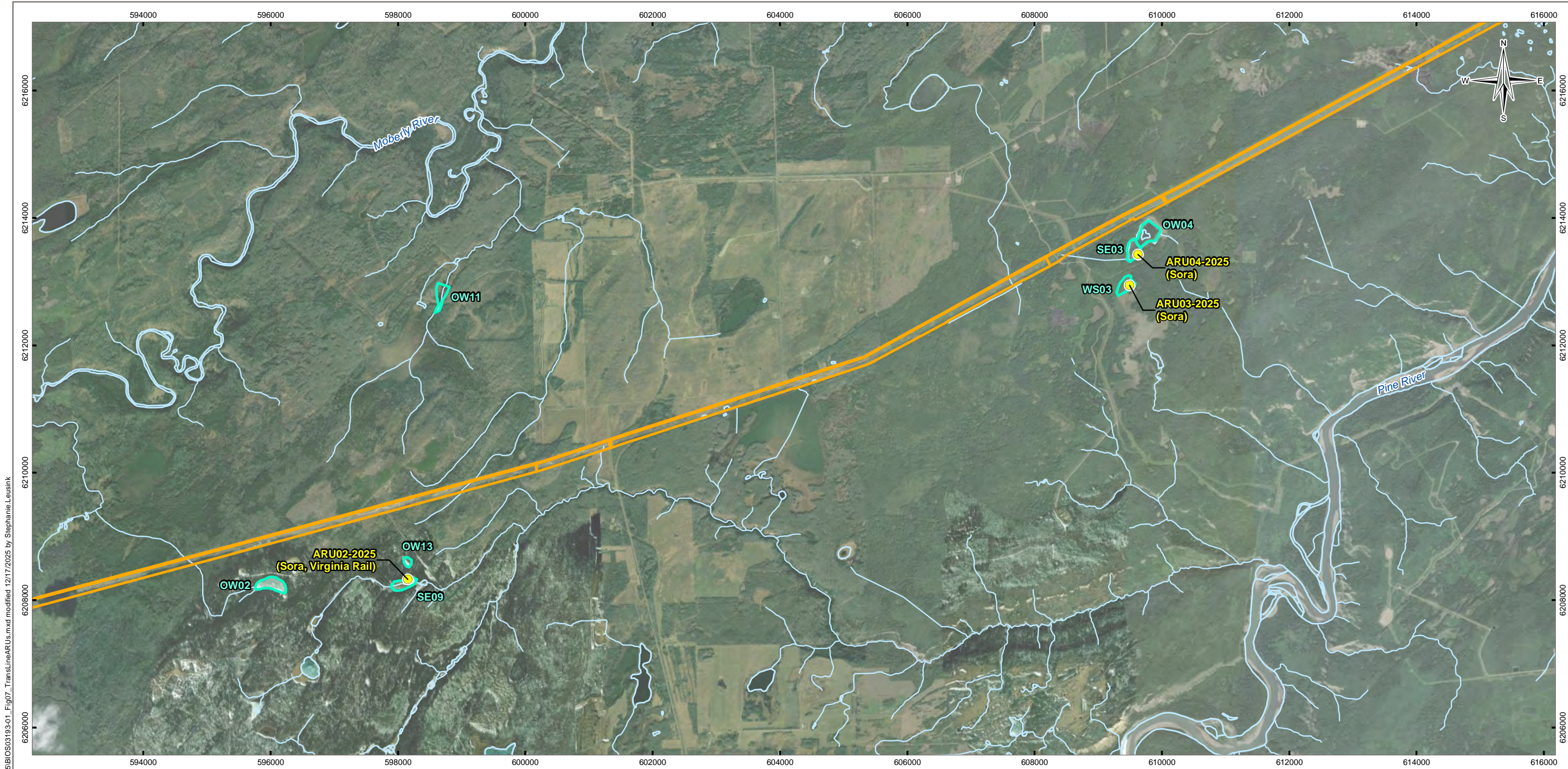
**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

**SITE C WATERBIRD  
2025 ANNUAL REPORT**

**ARU Locations and Key Species  
Detections - Eastern Portion**

<b>PROJECTION</b> UTM Zone 10	<b>DATUM</b> NAD83	<b>CLIENT</b> <b>BC Hydro</b> Power smart
Scale: 1:60,000 		
<b>FILE NO.</b> BIOS03193-01_Fig07_TransLineARUs.mxd		
<b>OFFICE</b> Tt-VANC	<b>DWN</b> SL	<b>CKD</b> MRB
<b>DATE</b> December 17, 2025	<b>APVD</b> ZO	<b>REV</b> 0
<b>PROJECT NO.</b> ENW.BIOS03193-01		<b>Figure 7a</b>

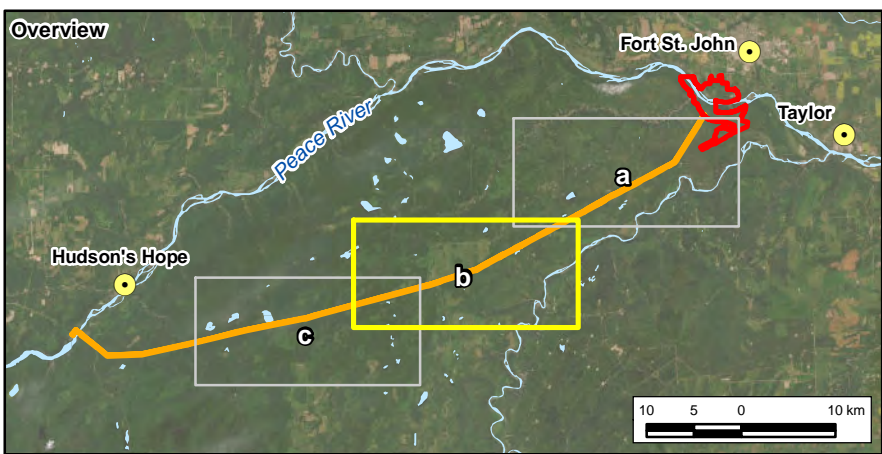
**STATUS**  
ISSUED FOR USE



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**LEGEND**

- 2025 ARU Location (Key Species Detected)
- Transmission Line Corridor
- Watercourse/Waterbody
- 2025 Surveyed Wetlands**
- Surveyed



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

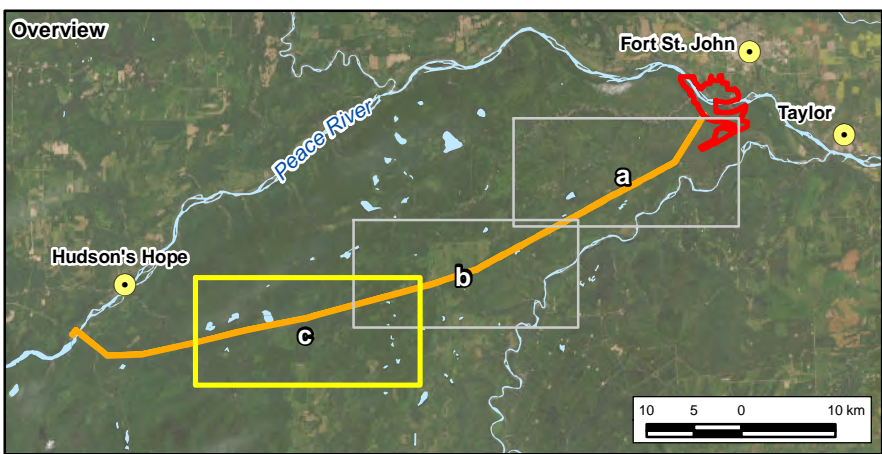
**STATUS**  
 ISSUED FOR USE

SITE C WATERBIRD 2025 ANNUAL REPORT				
ARU Locations and Key Species Detections - Central Portion				
PROJECTION UTM Zone 10			DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart
Scale: 1:60,000				
FILE NO. BIOS03193-01_Fig07_TransLineARUs.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025		PROJECT NO. ENW.BIOS03193-01		
Figure 7b				



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- LEGEND**
- 2025 ARU Location (Key Species Detected)
  - 2025 ARU Location Not Present at Retrieval Time
  - Transmission Line Corridor
  - ~ Watercourse/Waterbody
  - 2025 Surveyed Wetlands**
  - Surveyed



**NOTES**  
 Base data source:  
 Freshwater Atlas (2023)  
 Imagery from ESRI; Vantor  
 \* Partially surveyed wetland

SITE C WATERBIRD 2025 ANNUAL REPORT				
ARU Locations and Key Species Detections - Western Portion				
PROJECTION UTM Zone 10			DATUM NAD83	CLIENT <b>BC Hydro</b> Power smart
Scale: 1:60,000				
FILE NO. BIOS03193-01_Fig07_TransLineARUs.mxd				
OFFICE Tt-VANC	DWN SL	CKD MRB	APVD ZO	REV 0
DATE December 17, 2025		PROJECT NO. ENW.BIOS03193-01		
Figure 7c				

**STATUS**  
ISSUED FOR USE

## APPENDIX A

### SAULTEAU EBA ENVIRONMENTAL SERVICES JOINT VENTURE'S LIMITATIONS ON THE USE OF THIS DOCUMENT

# LIMITATIONS ON USE OF THIS DOCUMENT

## NATURAL SCIENCES

### 1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of Saulteau EBA Environmental Services Joint Venture's (SEES JV) Client (the "Client") as specifically identified in the SEES JV Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). SEES JV does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by SEES JV.

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### 1.2 ALTERNATIVE DOCUMENT FORMAT

Where SEES JV submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed SEES JV's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by SEES JV shall be deemed to be the original. SEES JV will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of SEES JV's Instruments of Professional Service shall not, under any circumstances, be altered by any party except SEES JV. SEES JV's Instruments of Professional Service will be used only and exactly as submitted by SEES JV.

Electronic files submitted by SEES JV have been prepared and submitted using specific software and hardware systems. SEES JV makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

### 1.3 STANDARD OF CARE

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### 1.7 ENVIRONMENTAL ISSUES

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The ability to rely upon and generalize from environmental baseline data is dependent on data collection activities occurring within biologically relevant survey windows.

It is incumbent upon the Client and any Authorized Party, to be knowledgeable of the level of risk that has been incorporated into the project design or scope, in consideration of the level of the environmental baseline information that was reasonably acquired to facilitate completion of the scope.

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### 1.8 NOTIFICATION OF AUTHORITIES

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SEES JV professionals are bound by their ethical commitments to act within the bounds of all pertinent regulations. In certain instances, observations by SEES JV of regulatory contravention may require that regulatory agencies and other persons be informed. The client agrees that notification to such bodies or persons as required may be done by SEES JV in its reasonably exercised discretion.

## APPENDIX B

### PEACE RIVER DIGITAL DATA COLLECTION FIELD FORM (SURVEY123)

**Appendix B: Peace River Digital Data Collection Field Form (Survey123)**

Survey Variable	Response Options within Survey123
<b>Basic Survey Details (data collected once per survey)</b>	
Surveyor Names	Full names of the QEPs conducting the survey
Date	Date of the survey
Survey Start Time	Start time of the survey
Start Location	Name of the boat launch where the boat survey started, e.g., Bear Flats boat launch, Halfway River boat launch, Taylor boat launch.
Survey End Time	End time of the survey
End Location	Name of the location where the boat survey ended, e.g., Hudson's Hope, Site C Dam (upstream side), Site C Dam (downstream side), Alberta border.
<b>Survey Weather Conditions (recorded at the start and end of survey)</b>	
Wind (Beaufort Scale)	0 (<1 km/hr, calm, water surface is like a mirror)
	1 (1-5 km/hr, light air, ripples with the appearance of scales are formed on the water, without crests)
	2 (6-11 km/hr, light breeze, small wavelets, still short but more pronounced, crests do not break)
	3 (12-19 km/hr, gentle breeze, large wavelets, crests begin to break, foam of glassy appearance, perhaps scattered whitecaps)
	4 (20-28 km/hr, moderate breeze, small waves that are becoming longer, fairly frequent whitecaps)
	5 (29-38 km/hr, fresh breeze, moderate waves that are taking a more pronounced long form, many whitecaps are formed, chance of some spray)
Air Temperature (°C)	Temperature recorded at the start or end of the survey
Percent Cloud Cover (%)	<1%
	5%
	10%
	25%
	40%
	50%
	60%
	75%
	80%
	90%
100%	
Precipitation	None
	Fog
	Light rain (<2.5 mm/hr)
	Moderate rain (2.6-7 mm/hr)
	Light snow fall
Moderate snowfall	
Visibility	Excellent
	Good
	Moderate
	Slightly poor
	Poor
<b>Waterbird Observations (repeatable section within the digital survey)</b>	
Observation Location	GPS coordinate
Species	Waterbird species
Number	Number of birds observed
Observation Data and Time	Date and time when the bird was observed
Water Depth (metres)	Very shallow (<0.5 m)
	Shallow (0.5-1 m)
	Moderate (2-5 m)
	Moderately deep (5-10 m)
	Deep (>10 m)
	Non-applicable (if observed out of the water)
Sediment or Substrate Type	Silt
	Sand
	Small gravels
	Large gravels
	Cobbles
	Boulder
	Bedrock or cliff
	Terrestrial vegetation
	Aquatic vegetation
	Non-applicable (if observed on the water)
Bird Behaviour at Detection	Flushed
	Flying
	Perched on land or vegetation
	Floating on the water
Peace River Habitat Type	River mainstem
	Backchannel
	Riverbank edge
	Vegetated island
	Sky (flying)
<b>Peace River Flow Measurement (repeatable section within the digital survey)</b>	
Flow Measurement Location	GPS coordinate
Flow Rate (metres/second)	Flow rate for the start or end survey location

## APPENDIX C

### TRANSMISSION LINE WETLANDS DIGITAL DATA COLLECTION FIELD FORM (SURVEY123)

**Appendix C: Transmission Line Wetlands Digital Data Collection Field Form (Survey123)**

Survey Variable	Response Options within Survey123	
<b>Basic Survey Details (data collected once per survey)</b>		
Surveyor Names	Full names of the QEPs conducting the survey	
Date	Date of the survey	
Survey Start Time	Start time of the survey	
Survey End Time	End time of the survey	
Wetland Station ID	Wetland station ID for the survey location	
Proportion of Sedge (SE) Wetland Area (%)	0	
	1-10	
	11-30	
	31-50	
	51-75	
	76-100	
Proportion of Willow-Sedge (WS) Wetland Area (%)	0	
	1-10	
	11-30	
	31-50	
	51-75	
	76-100	
Proportion of Open Water (OW) Wetland Area (%)	0	
	1-10	
	11-30	
	31-50	
	51-75	
	76-100	
Average Water Depth (for SE and WS transects only)	Very shallow (<0.1 m)	
	Shallow (0.1-0.5 m)	
	Moderate depth (0.5-1 m)	
	Moderate to deep (1-2 m)	
	Deep (>2 m)	
	Not applicable (an open water wetland)	
<b>Survey Weather Conditions (recorded at the start and end of survey)</b>		
Wind (Beaufort Scale)	0 (<1 km/hr, calm, smoke rises vertically)	
	1 (1-5 km/hr, light air, direction of wind shown by smoke drift, but not wind vanes)	
	2 (6-11 km/hr, light breeze, wind felt on face, leaves rustle, ordinary vane moved by wind)	
	3 (12-19 km/hr, gentle breeze, leaves and small twigs in constant motion, wind extends light flag)	
	4 (20-28 km/hr, moderate breeze, raises dust and loose paper, small branches are moved)	
	5 (29-38 km/hr, fresh breeze, small trees with leaves begin to sway, crested wavelets form on inland waters)	
Air Temperature (°C)	Temperature recorded at the start or end of the survey	
Percent Cloud Cover (%)	<1%	
	5%	
	10%	
	25%	
	40%	
	50%	
	60%	
	75%	
	80%	
	90%	
	100%	
Precipitation	None	
	Fog	
	Light rain (<2.5 mm/hr)	
	Moderate rain (2.6-7 mm/hr)	
	Light snow fall	
Visibility	Moderate snowfall	
	Excellent	
	Good	
	Moderate	
	Slightly poor	
<b>Habitat Observations (recorded once per wetland survey)</b>	Poor	
	Survey Type	Open Water Standwatch (OW) Sedge Transect (SE) Willow-Sedge Transect (WS)
	Survey start time	This field auto-populates when clicked.
	Proportion of Sedge (SE) Habitat within Survey Area (%)	0
		1-10
		11-30
		31-50
		51-75
		76-100
	Proportion of Willow-Sedge (WS) Habitat within Survey Area (%)	0
		1-10
11-30		
31-50		
51-75		
76-100		
Proportion of Open Water (OW) Habitat within Survey Area (%)	0	
	1-10	
	11-30	
	31-50	
	51-75	
	76-100	
Width of Contiguous Habitat for Transects (metres)	Width entered as numerical value	

**Appendix C: Transmission Line Wetlands Digital Data Collection Field Form (Survey123)**

Survey Variable	Response Options within Survey123
<b>Waterbird Observations (repeatable section within the digital survey)</b>	
Species	Waterbird species
Number	Number of birds observed
Water Depth (metres)	Very shallow (<0.5 m)
	Shallow (0.5-1 m)
	Moderate (2-5 m)
	Moderately deep (5-10 m)
	Deep (>10 m)
	Non-applicable (if observed out of the water)
Habitat Type	Aquatic vegetation
	Upland vegetation
	Tree
	Nest
Distance from Observer (metres)	<5 m
	5-10 m
	10-20 m
	20-50 m
	50-75 m
	75-100
	>100 m
Bird Behaviour at Detection	Flushed
	Flying
	Perched on land or vegetation
	Floating on the water

## APPENDIX D

### WATERBIRD SPECIES LIST, FORAGING GUILD, AND TOTAL ABUNDANCE IN 2025

**Appendix D: Waterbird Species List, Foraging Guild, and Total Abundance in 2025**

Foraging Guild	Species Common Name	Species Scientific Name	Peace River Abundance	Standwatch Abundance	Transect Abundance
Benthic-feeding Divers	Bufflehead	<i>Bucephala albeola</i>	5	192	
	Canvasback	<i>Aythya valisineria</i>		2	
	Common Goldeneye	<i>Bucephala clangula</i>	582	15	
	Greater Scaup	<i>Aythya marila</i>	1	108	
	Lesser Scaup	<i>Aythya affinis</i>		201	
	Redhead	<i>Aythya americana</i>	6	4	
	Ring-necked Duck	<i>Aythya collaris</i>		504	
	Ruddy Duck	<i>Oxyura jamaicensis</i>		2	
Cranes and Herons	Sandhill Crane	<i>Antigone canadensis</i>		1	
Dabbling Ducks	American Coot	<i>Fulica americana</i>		28	
	American Wigeon	<i>Mareca americana</i>	7	27	1
	Blue-winged Teal	<i>Spatula discors</i>		57	
	Green-winged Teal	<i>Anas carolinensis</i>	31	84	
	Mallard	<i>Anas platyrhynchos</i>	1360	453	1
	Northern Pintail	<i>Anas acuta</i>	161		
	Northern Shoveler	<i>Spatula clypeata</i>	17		
Gulls and Surface-feeding Terns	American Herring Gull	<i>Larus smithsonianus</i>	77		
	Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	55	3	
	California Gull	<i>Larus californicus</i>	1		
	Franklin's Gull	<i>Leucophaeus pipixcan</i>	818		
	Ring-billed Gull	<i>Larus delawarensis</i>	579	95	
Large Dabblers	Cackling Goose	<i>Branta hutchinsii</i>	1		
	Canada Goose	<i>Branta canadensis</i>	2996	41	6
	Greater White-fronted Goose	<i>Anser albifrons</i>	1		
	Trumpeter Swan	<i>Cygnus buccinator</i>	17	59	
Marsh Birds	Sora	<i>Porzana carolina</i>		16	1
	Wilson's Snipe	<i>Gallinago delicata</i>		8	10
Piscivorous Divers	Belted Kingfisher	<i>Megaceryle alcyon</i>	9		
	Common Loon	<i>Gavia immer</i>	19	25	
	Common Merganser	<i>Mergus merganser</i>	199	14	
	Eared Grebe	<i>Podiceps nigricollis</i>		6	
	Hooded Merganser	<i>Lophodytes cucullatus</i>		14	
	Horned Grebe	<i>Podiceps auritus</i>		9	
	Pied-billed Grebe	<i>Podilymbus podiceps</i>	1	5	
	Red-necked Grebe	<i>Podiceps grisegena</i>	7	25	
Shorebirds	Greater Yellowlegs	<i>Tringa melanoleuca</i>		16	
	Hudsonian Godwit	<i>Limosa haemastica</i>		8	
	Killdeer	<i>Charadrius vociferus</i>		2	
	Least Sandpiper	<i>Calidris minutilla</i>		1	
	Lesser Yellowlegs	<i>Tringa flavipes</i>		113	
	Red-necked Phalarope	<i>Phalaropus lobatus</i>	90		
	Solitary Sandpiper	<i>Tringa solitaria</i>	2	24	1
	Spotted Sandpiper	<i>Actitis macularius</i>	67	4	2
Unknown Waterbirds	Unknown Duck		15		
	Unknown Gull		16		
	Unknown Shorebird		1	4	
<b>Totals</b>			<b>7141</b>	<b>2170</b>	<b>22</b>

## APPENDIX E

### TRANSMISSION LINE WETLANDS TOTAL SPECIES RICHNESS AND TOTAL ABUNDANCE

**Appendix E: Transmission Line Wetlands Total Species Richness and Total Abundance**

Wetland Station ID	OW01	OW02	OW04	OW06	OW07	OW11	OW12	OW13	SE02	SE03
<b>Species Detected</b>	American Coot	Bufflehead	Blue-winged Teal	American Wigeon	American Wigeon	Blue-winged Teal	Greater Yellowlegs	Spotted Sandpiper	Canada Goose	Blue-winged Teal
	Blue-winged Teal	Canada Goose	Bufflehead	Blue-winged Teal	Blue-winged Teal	Green-winged Teal	Mallard		Mallard	Bufflehead
	Bonaparte's Gull	Common Loon	Common Loon	Bufflehead	Bufflehead	Mallard	Wilson's Snipe		Solitary Sandpiper	Canada Goose
	Bufflehead	Common Merganser	Green-winged Teal	Canada Goose	Canada Goose	Solitary Sandpiper				Greater Yellowlegs
	Canada Goose	Green-winged Teal	Lesser Scaup	Canvasback	Greater Yellowlegs					Green-winged Teal
	Common Goldeneye	Hooded Merganser	Lesser Yellowlegs	Common Goldeneye	Green-winged Teal					Mallard
	Common Loon	Lesser Yellowlegs	Mallard	Common Loon	Mallard					Pied-billed Grebe
	Common Merganser	Mallard	Pied-billed Grebe	Eared Grebe	Ring-necked Duck					Ring-necked Duck
	Eared Grebe	Ring-necked Duck	Ring-necked Duck	Greater Scaup	Solitary Sandpiper					Sandhill Crane
	Greater Scaup	Spotted Sandpiper	Solitary Sandpiper	Greater Yellowlegs	Sora					Trumpeter Swan
	Hooded Merganser		Sora	Green-winged Teal	Trumpeter Swan					
	Killdeer		Trumpeter Swan	Hooded Merganser						
	Lesser Scaup			Horned Grebe						
	Mallard			Lesser Scaup						
	Redhead			Lesser Yellowlegs						
	Red-necked Grebe			Mallard						
	Ring-billed Gull			Hudsonian Godwit						
	Ring-necked Duck			Pied-billed Grebe						
	Sora			Red-necked Grebe						
	Trumpeter Swan			Ring-necked Duck						
	Wilson's Snipe			Solitary Sandpiper						
			Trumpeter Swan							
<b>Species Richness</b>	21	10	12	22	11	4	3	1	3	10
<b>Standwatch Total Abundance</b>	684	82	139	802	138	18	4	NA*	NA*	109
<b>Transect Total Abundance</b>	0	NA**	NA**	0	NA**	NA**	0	2	5	NA**
<b>Grand Total Abundance</b>	<b>684</b>	<b>82</b>	<b>139</b>	<b>802</b>	<b>138</b>	<b>18</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>109</b>

\*No standwatch surveys were conducted

\*\*No transect surveys were conducted

**Appendix E: Transmission Line**

Wetland Station ID	SE04	SE05	SE06	SE07	SE09	SE10	SE11	SE12	SE14	WS01	WS02	WS03
<b>Species Detected</b>	Wilson's Snipe	American Coot		American Wigeon	American Wigeon	Blue-winged Teal	Canada Goose	American Wigeon	American Wigeon			Canada Goose
		American Wigeon		Mallard	Blue-winged Teal	Bufflehead	Wilson's Snipe	Canada Goose	Green-winged Teal			Wilson's Snipe
		Blue-winged Teal			Bufflehead	Green-winged Teal		Green-winged Teal	Wilson's Snipe			
		Bufflehead			Green-winged Teal	Mallard		Least Sandpiper				
		Canada Goose			Mallard	Sora		Mallard				
		Greater Yellowlegs			Ring-necked Duck	Wilson's Snipe		Sora				
		Green-winged Teal			Solitary Sandpiper			Wilson's Snipe				
		Mallard			Sora							
		Ruddy Duck			Trumpeter Swan							
		Solitary Sandpiper			Wilson's Snipe							
		Wilson's Snipe										
	<b>Species Richness</b>	1	11	0	2	10	6	2	7	3	0	0
<b>Standwatch Total Abundance</b>	NA*	64	0	NA*	50	31	NA*	33	10	NA*	NA*	0
<b>Transect Total Abundance</b>	5	NA**	0	6	1	NA**	3	NA**	1	0	0	3
<b>Grand Total Abundance</b>	<b>5</b>	<b>64</b>	<b>0</b>	<b>8</b>	<b>51</b>	<b>31</b>	<b>3</b>	<b>33</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>3</b>

\*No standwatch surveys were conducted

\*\*No transect surveys were conducted

## **Appendix 5. 2025 Nest Monitoring Report**

## Site C Migratory Bird Nest Monitoring Program – 2025 Annual Report



Site C Reservoir at Halfway River Confluence. Photo Credit: Neil Simpson



Downstream River Channel. Photo Credit: Neil Simpson



Alder Flycatcher nest. Photo Credit: Neil Simpson

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## Executive Summary

BC Hydro has developed several programs, in consultation with Environment Canada and the Province of British Columbia, to monitor and mitigate potential disturbance to breeding migratory birds during the Site C Clean Energy Project (the Project), where risks to migratory bird nests could occur during reservoir construction, filling, and operations. The Site C Migratory Bird Nest Monitoring Program documents whether changes in water levels observed during construction and operations in the headpond (construction) or reservoir (operations), and downstream of the dam (construction and operations) result in the loss of active migratory bird nests.

With the filling of the Site C Reservoir in late 2024, the Project is now in the operations phase. The first two years of nest monitoring, during the construction phase, took place in 2021 and 2022. In 2025, monitoring was conducted in the reservoir upstream of the dam and the river channel downstream of the dam. This report summarizes the results of the 2025 field season.

The disturbance or mortality of nesting migratory birds due to changing water levels was assessed through a nest searching and monitoring program. Nesting attempts of migratory bird species were monitored on selected plots of the various habitat types within the reservoir and river channel downstream of the dam. Supplementary data were collected on the potential number of territories for each species observed on the monitoring plots to assist with calculating nest densities by habitat.

Thirty plots totalling an area of 18.6 ha were surveyed regularly from May 30 to July 28, 2025. A total of 115 nests of 23 species were located, including 73 nests of 20 species within the intensively surveyed nest monitoring plots. A species federally listed as Threatened, Common Nighthawk (*Chordeiles minor*), was detected nesting on two plots within the reservoir and two locations outside of monitoring plots downstream.

Across the study area, 42% of nests detected were considered successful, 43% failed, and 16% had an unknown outcome. The most common cause of nest failure was predation, as is typical for breeding birds. Three nests failed due to flooding: two in the reservoir and one downstream of the dam. All three nests were on the ground and were either Spotted Sandpiper (*Actitis macularius*) or *Melospiza* sp. nests (either Lincoln Sparrow [*Melospiza lincolnii*] or Song Sparrow [*Melospiza melodia*]).

Prior to the next field season, habitat mapping in the reservoir should be refined based on updated aerial imagery. This will allow numbers of nests to be estimated for the full study area based on the nest densities for each habitat stratum and the amount of available habitat within the study area. Estimates will also be made of the total potential impact of nest flooding in the study area based on elevation and habitat availability.

This Executive Summary is not intended to be a stand-alone document, but a summary of findings as described in the following report. It is intended to be used in conjunction with the scope of services and limitations described therein.

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## List of Acronyms and Abbreviations

Acronym / Abbreviation	Definition
Ausenco	Ausenco Sustainability ULC
BC	British Columbia
DRC	Downstream River Channel
HPZ	Headpond Zone
Project	Site C Clean Energy Project
RDZ	Reservoir Drawdown Zone

## List of Symbols and Units of Measure

Symbol / Unit of Measure	Definition
ha	hectare
m	metre
m ASL	metres above sea level

## 1.0 Introduction

The Site C Clean Energy Project (the Project) is located on the Peace River in northeastern British Columbia (BC) (**Figure 1.1**). The Site C Migratory Bird Nest Monitoring Program is one of several programs that BC Hydro has developed to monitor and mitigate potential disturbance to breeding migratory birds during the Project. The first two years of bird nest monitoring took place in 2021 and 2022 during the construction phase of the Project. This report summarizes the first year of surveys during the operations phase, which took place in 2025.

### 1.1 Background

BC Hydro used key species groups, including migratory birds, to assess the potential effects of the Project on Wildlife Resources in the Site C Environmental Impact Statement (BC Hydro 2013). The report of the Joint Review Panel concluded that the Project would likely cause significant (20% change relative to baseline) adverse effects to migratory birds relying on valley bottom habitat during their life cycle (Government of BC and Government of Canada 2014).

The requirements for wildlife monitoring during Project construction and operations were outlined in the provincial Environmental Assessment Certificate and the Federal Decision Statement. Condition 21 of the Environmental Assessment Certificate states that:

*The EAC Holder must ensure that measures implemented to manage harmful Project effects on wildlife resources are effective by implementing monitoring measures detailed in a Vegetation and Wildlife Mitigation and Monitoring Plan. The Vegetation and Wildlife Mitigation and Monitoring Plan must be developed by a QEP (Qualified Environmental Professional).*

*The Vegetation and Wildlife Mitigation and Monitoring Plan must include at least the following:*

- *Survey songbird and ground-nesting raptor populations during construction and operations.*

The Site C Migratory Bird Nest Monitoring Program contributes to addressing the following sections of Federal Decision Statement Condition 9:

*9.1. The Proponent shall ensure that the Designated Project is carried out in a manner that avoids mortality and disturbance of migratory birds and their nests.*

*9.3. The Proponent shall develop, in consultation with Environment Canada, a plan to monitor and mitigate potential disturbance to breeding migratory birds in and adjacent to the project activity zone including the area immediately downstream of the dam where risks to migratory bird nests could occur, during construction, reservoir filling and operation.*

*9.4. The plan shall include measures to undertake construction, reservoir filling and operation in a manner that avoids or minimizes the risk of disturbance and mortality to migratory birds and their nests.*

Federal Decision Statement Condition 10 requires that the plan provides:

*10.3.6. an approach to monitor and evaluate the effectiveness of the mitigation or compensation measures to be implemented and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory bird habitat, including migratory bird use of that habitat.*

The Site C Clean Energy Project Vegetation and Wildlife Mitigation and Monitoring Plan (BC Hydro 2015) was developed to address the provincial and federal conditions. Section 7.1.2.2.B of this plan provided guidelines for the Site C Migratory Bird Nest Monitoring Program and the details of this program are described in the document Site C Vegetation and Wildlife Migratory Bird Nest Monitoring Program (BC Hydro 2021).

## 1.2 Objectives and Scope

The objective of the Site C Migratory Bird Nest Program is to “monitor the potential disturbance of breeding migratory birds” during construction, reservoir filling, and operations (BC Hydro 2015). The scope is to “document if changes in water levels observed during construction and operations in the reservoir and downstream of the dam result in the loss of active migratory bird nests” (BC Hydro 2015). The disturbance to and mortality of migratory birds (and their nests) will be evaluated to determine the relative contribution of the Project to documented nest impacts.

Data collected by the program will address the following questions (BC Hydro 2021):

1. How many nesting migratory bird species and associated nests are present within the study area?
2. How many of these nests experience disturbance or mortality due to fluctuating water levels?

### 1.2.1 Study Area and Sub-areas

The study area for the nest monitoring program is the shoreline of the Peace River between the Peace Canyon Dam and the confluence with the Pine River and consists of three sub-areas:

- Downstream River Channel (DRC) – The Peace River downstream of the Site C Dam to the confluence with the Pine River. The nest monitoring program surveys shoreline areas between expected maximum and minimum flows.
- Headpond Zone (HPZ) – A temporary headpond existed upstream of the dam during construction. The nest monitoring program monitored the expected zone of water level fluctuation.
- Reservoir Drawdown Zone (RDZ) – The Peace River between the Peace Canyon Dam and the Site C Dam (Site C Reservoir). The nest monitoring program surveys areas within the zone of fluctuation between the minimum normal (460 m) and maximum normal (461.8 m) reservoir water levels.

The DRC and HPZ were monitored during the construction phase in 2021 and 2022. With the filling of the Site C Reservoir in late 2024, the Project is now in the operations phase. During operations (2025 onward), the DRC and RDZ are being monitored (**Figure 1.1**).

The reservoir extends 83 kilometres from the Peace Canyon Dam near Hudson’s Hope to the Site C Dam near Fort St. John covering an area of 9,330 hectares (ha). During reservoir filling, the water level at the dam site was increased by 43 metres (m) and the shoreline was permanently changed. The reservoir is 52 m deep at the Site C Dam and 18 m deep near Hudson’s Hope.

During operations, the daily reservoir levels are expected to be within 0.6 m below 461.8 m, the maximum normal elevation, 99% of the time, with fluctuations possibly occurring two to three times per day (BC Hydro 2013). A larger fluctuation may occur during one-in-ten-year flood events when the reservoir could be drawn down by 1.5 m in expectation of increased inflow and then refilled up to the maximum normal elevation over several days. Due to the short time frame of these fluctuations, it was predicted that it would be unlikely for nests to be established within the drawdown zone (BC Hydro 2021). Additional changes to the daily water level regime could occur with increased power demand but were expected to occur primarily during winter when migratory birds are not nesting.

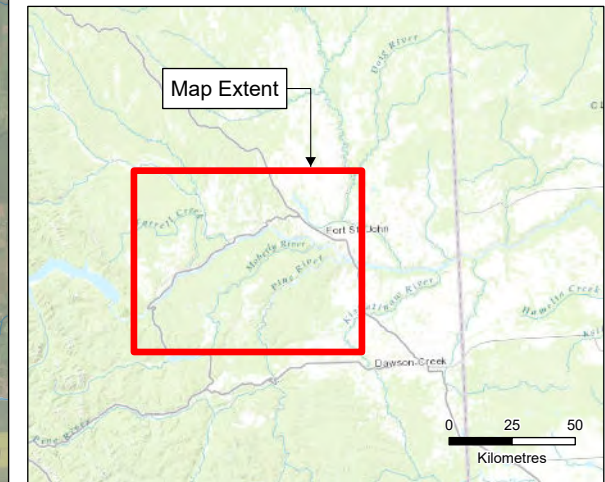
Downstream of the Site C Dam, the Peace River continues from BC through Alberta to Great Slave Lake. The volume of water released from the Site C Dam dictates the river channel footprint between the dam and the confluence with the Pine River. At this confluence, the Pine River adds sufficient volume to make fluctuations caused by the dam indistinguishable downstream.

### **1.2.2 Temporal Scope**

The first two years of bird nest monitoring took place in 2021 and 2022 during the construction phase of the Project. This year (2025) was the first season of monitoring during the operations phase and monitoring during this phase will be conducted every second year over 10 years (BC Hydro 2021).

The migratory bird breeding period in the study area is from late April to late August (the Project area falls within Zone B5 of the general nesting periods of migratory birds in Canada (Government of Canada 2018) but late May through mid July is when most species likely to be found within the study area are expected to be actively breeding (Rousseu and Drolet 2015), thus nest monitoring will occur primarily from May to July.

2025 Overview of Study Area



Legend

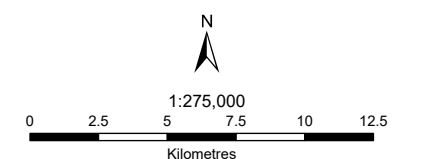
- City
- Nest Monitoring Plot Centroid
- Site C Dam
- Water Level Monitoring Station
- Watercourse
- Downstream River Channel (DRC)
- Reservoir Drawdown Zone (RDZ)
- Waterbody

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Contains information licensed under the Open Government Licence - Province of British Columbia
- Aerial Image: BC Hydro Ortho Imagery (2023), ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map



NAD 1983 UTM Zone 10N  
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## 2.0 Methods

### 2.1 Water Levels

Water level data were available for multiple stations within the RDZ and DRC for every hour of each day throughout the bird breeding season. For plotting purposes, daily averages were calculated to minimize clutter on the figures. To visualize overall water levels within the study sub-areas and for discussion of relative water level fluctuations, we used the station located at the Halfway River confluence for the RDZ and the station at Old Fort for the DRC (**Figure 1.1**). These stations are located centrally within each sub-area and had minimal missing data. Water level / water elevation is presented throughout this report in metres above sea level (m ASL).

### 2.2 Habitat Classification and Plot Selection

Each year, the nest monitoring program has surveyed a subset of the available habitat with the study area, with the goal of applying the nest densities determined for each habitat stratum to the entire sub-area.

The original plan was to use habitat mapping completed prior to dam construction to classify habitat (BC Hydro 2021), but habitat observed in the field in 2021 did not align with the older mapping (Hemmera 2022). Thus, prior to the 2022 field season, habitats in the DRC and HPZ were classified into five strata using updated aerial imagery and LiDAR data: Tree, Shrub, Herb, Wetland, and Unvegetated (**Table 2.1**).

**Table 2.1** Descriptions of Habitat Strata

Habitat Stratum	Description
Tree	Vegetation over 10 m tall. These locations were buffered by 1.5 m.
Shrub	Vegetation under 10 m tall and/or appearing to be shrubs (clumps of vegetation) on aerial imagery.
Herb	Vegetated areas that did not appear to be shrubs or trees (uniform and not clumped).
Wetland	One wetland was present within the HPZ. No wetlands are present within the RDZ or DRC.
Unvegetated	Areas that did not appear to be vegetated on aerial imagery (e.g., dirt roads, sand/gravel/cobble shoreline).

With the filling of the reservoir in 2024, the HPZ was flooded, and the RDZ is the upstream study sub-area during the operations phase. Prior to the 2025 field season, updated imagery of the RDZ after reservoir filling was not available. Preliminary habitat mapping of the area was completed using older imagery and initial plot selection was completed using the same habitat mapping. The habitat strata in **Table 2.1** were used to classify habitat in 2025, but there was no wetland habitat within the RDZ or DRC.

Survey plots were selected for each habitat stratum and included the variety of vegetation types (e.g., range of heights and species) observed within that stratum, where feasible. The first few days of the field season were used to confirm habitat and survey plot selection.

## 2.3 Nest Searching and Monitoring

### 2.3.1 Survey Timing and Effort

Field days were 10 hours including all travel and survey time. Nest searching and monitoring surveys took place starting at sunrise because songbirds are most active in the morning. Nest searching was conducted on each plot 1 to 2 times per week. Field surveys were not completed in inclement weather (e.g., rain). More time was spent searching on plots with complex vegetation or with known pairs for which nests had not yet been found.

As noted in **Section 1.2.2**, the core of the bird breeding season in the study area is from May through July. In 2025, 9 weeks of field surveys were planned between late May and late July. A longer field season was planned compared to 2022 because this was the first year of sampling in the RDZ and we wanted to sample more of the breeding season to inform future years of sampling.

### 2.3.2 Field Surveys

Nest searching was conducted by walking through plots and watching birds for behavioural cues indicating nesting. When behavioural cues were observed, additional time was spent attempting to locate nests. Nests were also found incidentally, such as when a surveyor accidentally flushed a bird from a nest while walking by. Occasionally, systematic searches were conducted in areas where nests were suspected. Nest searching was conducted in a manner that minimized disturbance to breeding birds and vegetation concealing the nest, while still maintaining search effectiveness.

Active nests were monitored every 3 to 4 days to determine nest stage (e.g., egg-laying, incubation), and these checks were typically incorporated in the nest-searching surveys.

We also recorded the number of suspected territories for each species on each plot based on the number of adults/pairs observed during nest surveys. The purpose of recording these territory mapping data was to provide additional information on the numbers of territories that may be present on a plot and thus the potential number of nests that may be present.

In the field, data were recorded on field survey forms and nest cards printed on waterproof paper (see example in the Nest Monitoring Plan (BC Hydro 2021)). All data, except for the territory mapping data, were entered daily into a custom nest monitoring database. Territory mapping data were entered into a spreadsheet.

Nest searching and monitoring methods are described in more detail in the program workplan, Site C Migratory Bird Nest Monitoring Program (BC Hydro 2021).

### 2.3.3 Data Analysis

Raw and custom data queries were exported from the nest monitoring database and all data management and analyses were completed using R Statistical Software (R Core Team 2025). Taxonomic information was drawn from the most recent American Birding Association Checklist, which follows changes made to the American Ornithological Society's North and Middle American Birds checklist (American Birding Association 2025).

A summary of nest monitoring survey effort was tabulated by calculating the number of person-hours spent conducting field activities on plots of each habitat stratum, as well as off plot monitoring. Effort from early season surveys on plots that were later dropped from the survey set were considered off plot monitoring. Average survey effort for each habitat stratum was calculated by averaging the total hours by the number of plots surveyed.

Nest records and monitoring data were summarized to provide information about migratory bird nesting activity within the study area. Only data from nests on nest monitoring plots (on plot nests) were included when summarizing results by habitat stratum, but all nest records (both on plot nests and off plot nests) were included for other types of summaries. Off plot nests were found when a pair observed on plot nested outside the plot boundary or when travelling to or between plots.

The numbers of nests detected were calculated within the RDZ and the DRC (both on and off plot), and within each habitat stratum. For each habitat stratum, species richness (i.e., the number of species) and species evenness (i.e., the degree of similarity in abundance of each species) were calculated. Species evenness was calculated using Pielou's evenness:

$$\text{Species evenness} = \frac{(-\sum_{i=1}^s (p_i \times \ln p_i))}{(\ln S)}$$

where  $S$  is the number of species (i.e., species richness),  $p_i$  is the proportion of all sampled birds represented by species  $i$ , and  $\ln$  is the natural logarithm (MacDonald et al. 2017). These species diversity metrics were calculated using the R package 'vegan' (Oksanen et al. 2022).

A minimum nest density for each habitat was calculated using confirmed nests and an adjusted nest density was calculated by incorporating territory mapping data (i.e., nests not found that may have been present for pairs observed repeatedly).

Ground elevations for plots and nest locations were estimated from a digital elevation model. The ground elevation at the nest site and the nest height above ground were added together to calculate the nest elevation in m ASL for each nest. These nest elevations were used to determine the potential for nests to interact with fluctuating water levels.

Nest phenology information was calculated for each nest to allow the estimation of the time periods during which nests are likely to be active for each species. Date of clutch initiation (date the first egg was laid) was estimated based on recorded dates of egg laying (when eggs were counted) or nestling observations (when nestling age is estimated) and published knowledge of incubation periods (Billerman et al. 2025) assuming one egg was laid per day and incubation began on the day the final egg was laid.

The last observation at a nest was used to determine the end of the nesting period. Using the nest initiation dates and last observation dates, a data set was generated indicating the status of each nest (active/inactive) on each day during the time span when known nests were active. The proportion of the total nests found that were active on each day was determined by summing the number of nests active on that day and dividing that value by the total number of nests in the data set. To visualize nest phenology, these values were then plotted using a loess smoother (span = 0.2) within the 'geom\_smooth' function in the R package 'ggplot2' (Wickham 2016).

The number of nests per hectare (nest density) was calculated for each habitat stratum by dividing the sum of the numbers of nests by the sum of the areas of the monitored plots. These estimates do not account for the detectability of individual species, thus should be considered minimums, although the multiple field surveys over the season helps to decrease this uncertainty.

A second calculation of nest density was completed under the assumption that nests may have been present for pairs observed repeatedly on plots but for which nests were not found (i.e., pairs documented in territory mapping data). Nest density calculations by habitat strata are cumulative and include all nests from the entire monitoring period. Thus, these calculations provide density estimates for the entire breeding season, not the density of active nests at any one time.

Nest outcome percentages were calculated by dividing the total number of confirmed nests for each nest outcome by the total number of nests with known outcomes for the overall study area, each study sub-area, and each habitat stratum. Unconfirmed nests that may have been present based on territory mapping were not included in nest outcome calculations because nest presence and outcomes could not be determined.

### 3.0 Results

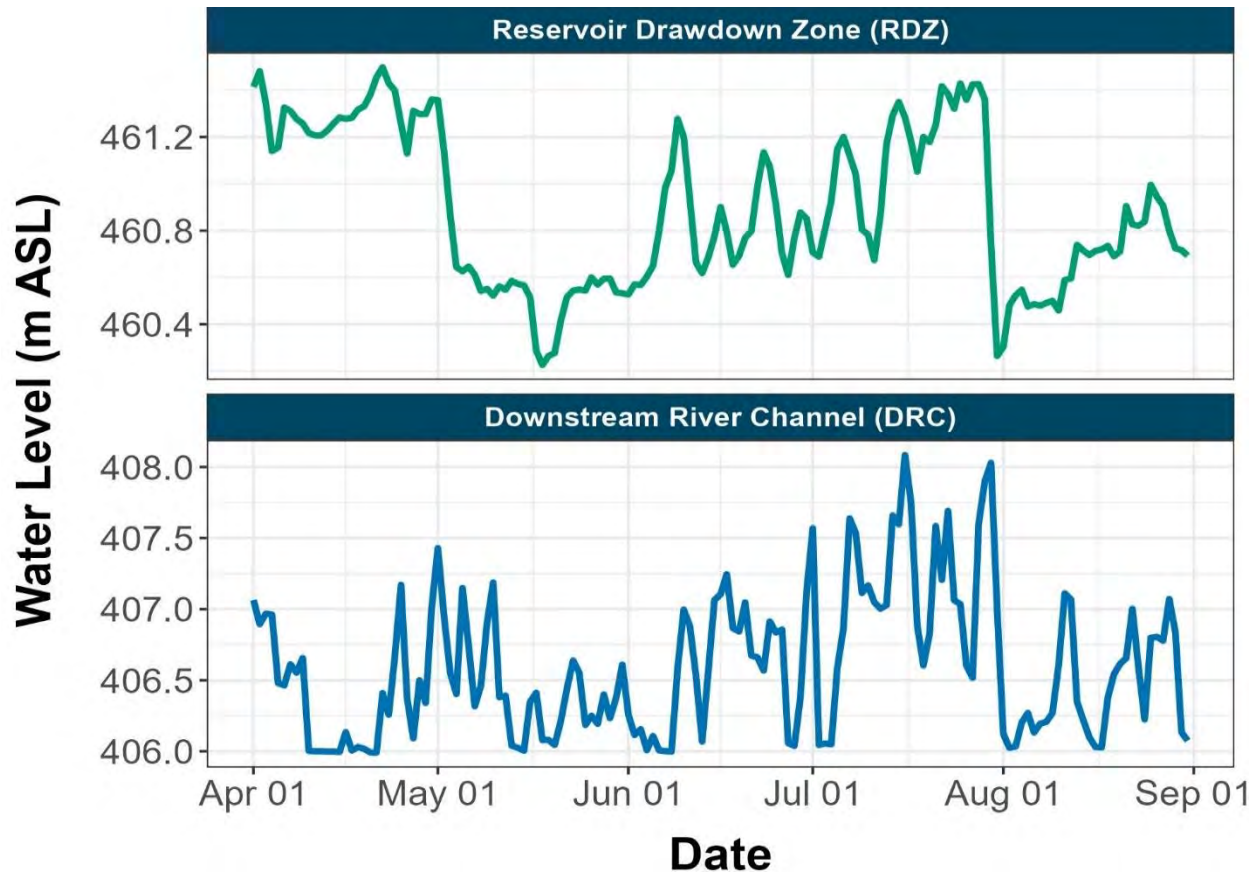
#### 3.1 Water Levels

Water levels in the RDZ decreased after April and were lower through May, then generally increased and fluctuated more regularly through the end of July (**Figure 3.1**). Water levels decreased substantially at the end of July and generally increased in August. Water levels in the DRC fluctuated more consistently throughout the breeding season and were highest in mid and late July before decreasing at the end of the month.

During the field survey period (May 27 to July 28), the water level varied within a 1.03 m range (460.48 to 461.51 m ASL) in the RDZ. The water level was at the minimum elevation on May 30 and the maximum elevation on July 25. Over the entire bird breeding season (April 22 to August 24) water levels fluctuated over 1.34 m (460.20 to 461.54 m ASL) and were at a minimum on April 22 and maximum on August 1.

In the DRC, water levels ranged over 2.59 m (405.98 to 408.57 m ASL) during both the field survey period and the entire breeding bird season. The water level was at the minimum elevation on June 9 and the maximum elevation on July 17.

The largest change in the daily average water level in the RDZ was 0.30 m on July 13. The largest change in the daily average water level in DRC was 1.09 m on July 28.



**Figure 3.1 Daily Average Water Levels (m ASL) in the RDZ and DRC during the 2025 Migratory Bird Breeding Season**

### 3.2 Habitat Classification and Plot Selection

Thirty plots totalling an area of 18.6 ha were surveyed during 2025, including 12.0 ha in the DRC and 6.5 ha in the RDZ (**Appendix A**). The elevation of plots surveyed in the DRC and RDZ ranged from 404 to 419 m and 459 to 482 m, respectively (**Table 3.1**). The selected plots in each sub-area covered each of the four habitat strata (**Table 3.2**).

**Table 3.1 Nest Monitoring Plot Habitat Strata, Areas, and Elevations**

Plot ID	Habitat Stratum	Area (ha)	Minimum Elevation (m ASL)	Average Elevation (m ASL)	Maximum Elevation (m ASL)
<b>Downstream River Channel (DRC)</b>					
25	Unvegetated	0.31	408	408	408
26	Herb	0.13	408	408	409
27	Herb	0.66	408	409	412
28	Shrub	0.91	408	410	412
30	Shrub	0.57	406	407	409
31	Unvegetated	0.79	405	406	407
32	Herb	0.37	405	407	408
33	Tree	0.16	408	412	419
34	Unvegetated	1.43	404	405	407
35	Shrub	1.61	405	407	419
36	Unvegetated	4.74	404	405	408
37	Herb	0.34	405	407	411
<b>Reservoir Drawdown Zone (RDZ)</b>					
R14-01	Shrub	0.52	461	462	464
R21-01	Herb	0.20	461	462	463
R21-02	Herb	0.48	461	462	464
R21-03	Unvegetated	0.42	461	461	462
R22-01	Unvegetated	0.03	459	461	462
R22-02	Herb	0.14	460	462	462
R22-03	Shrub	0.09	460	461	462
R22-04	Herb	0.62	460	461	462
R24-01	Shrub	0.65	461	464	473
R35-01	Shrub	0.12	461	467	477
R35-02	Shrub	0.37	461	468	482
R37-01	Tree	0.27	463	467	476
R37-02	Shrub	0.67	461	466	471
R40-01	Unvegetated	0.39	460	461	462
R40-02	Herb	0.94	461	462	462
R40-03	Unvegetated	0.37	460	461	462
R53-01	Herb	0.13	461	462	462
R53-02	Shrub	0.12	462	464	470

**Table 3.2 Habitat Sampling Summary**

Habitat Stratum	Number of Plots	Total DRC Area Sampled (ha)	Total RDZ Area Sampled (ha)	Total Area Sampled (ha)
Tree	2	0.16	0.27	0.43
Shrub	10	3.09	2.54	5.64
Herb	10	1.50	2.51	4.01
Unvegetated	8	7.27	1.21	8.48
<b>Total</b>	<b>30</b>	<b>12.02</b>	<b>6.53</b>	<b>18.56</b>

### 3.3 Nest Searching and Monitoring

#### 3.3.1 Nest Survey Effort

Prior to starting nest surveys, three days (May 27 to May 29: one day in the DRC and two days in the RDZ) were spent finalizing nest monitoring plot selection for the 2025 field season. Some nests were found incidentally on those days. Nest monitoring surveys were conducted over 59 days from May 30 to July 28, 2025. Total field survey effort totaled 631 person-hours, including 613 person-hours on nest monitoring plots. Survey effort on nest monitoring plots included 519 person-hours searching for nests, 93 checking nests, and 1 completing other field activities (e.g., confirming plot boundary was mapped correctly, confirming species identification at known nests). On average, the most effort was spent nest searching on Shrub plots (**Table 3.3**).

**Table 3.3 Average Survey Effort on Nest Monitoring Plots by Habitat Stratum**

Habitat Stratum	Number of Plots (n)	Average Nest Searching Effort (person-hours per plot)	Average Nest Checking Effort (person-hours per plot)	Average Other Activity Effort (person-hours per plot)	Average Total Effort (person-hours per plot)
Tree	2	10.8	1	0	<b>11.8</b>
Shrub	10	35.3	5.8	0	<b>41.1</b>
Herb	10	11.7	2.7	0	<b>14.4</b>
Unvegetated	8	3.5	0.8	0.1	<b>4.4</b>

#### 3.3.2 Nest Records

A total of 115 nests were found in 2025, 40 in the DRC and 75 in the RDZ (**Table 3.4**). Seventy-three of the nests found were located on nest monitoring plots and 42 nests were off plot (**Table 3.4**).

**Table 3.4 Nest Locations Summary**

Nest Location	Downstream River Channel (Number of Nests)	Reservoir Drawdown Zone (Number of Nests)	Percentage of Total (Number of Nests)	Total (Number of Nests)
On plot	29	44	63	<b>73</b>
Off plot	11	31	37	<b>42</b>
<b>Total</b>	<b>40</b>	<b>75</b>	<b>100</b>	<b>115</b>

Twenty-three species were observed nesting within the study area in 2025 (**Table 3.5**). This included 20 species nesting on nest monitoring plots, and three species only observed nesting off plot. Fourteen species were detected in the DRC and 19 in the RDZ and some species were only confirmed nesting in one sub-area (**Table 3.5**).

There were seven nests in 2025 for which the species was not confirmed (an adult was either never seen at the nest or moved to/from the nest in such a way that the observer was unable to 100% visually confirm species). All of these were recorded as “unknown sparrow” and were most likely either Lincoln Sparrow (*Melospiza lincolnii*) or Song Sparrow (*Melospiza melodia*) nests based on nest size/placement; egg size, shape, and colour; estimated size, shape, and colour of the adult when glimpsed; and/or species observed or heard singing in the area.

**Table 3.5 Numbers of Nests for Species Nesting in the Downstream River Channel (DRC) and Reservoir Drawdown Zone (RDZ)**

Common Name	Scientific Name	Number of Nests				Total
		DRC		RDZ		
		Off plot	On plot	Off plot	On plot	
Alder Flycatcher	<i>Empidonax alnorum</i>	1	1	1	2	5
American Crow	<i>Corvus brachyrhynchos</i>	-	1	-	-	1
American Robin	<i>Turdus migratorius</i>	-	1	-	-	1
American Wigeon	<i>Mareca americana</i>	-	-	-	1	1
Black-and-white Warbler	<i>Mniotilta varia</i>	-	-	1	-	1
Black-billed Magpie	<i>Pica hudsonia</i>	-	1	-	-	1
Canada Goose	<i>Branta canadensis</i>	-	-	4	2	6
Cedar Waxwing	<i>Bombycilla cedrorum</i>	1	5	2	2	10
Clay-colored Sparrow	<i>Spizella pallida</i>	-	2	-	1	3
Common Nighthawk	<i>Chordeiles minor</i>	2	-	-	2	4
Common Yellowthroat	<i>Geothlypis trichas</i>	-	-	2	-	2
Dark-eyed Junco	<i>Junco hyemalis</i>	-	-	-	1	1
Gray Catbird	<i>Dumetella carolinensis</i>	-	-	2	-	2
Killdeer	<i>Charadrius vociferus</i>	1	3	-	3	7
Least Flycatcher	<i>Empidonax minimus</i>	-	-	-	1	1
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	-	1	3	2	6
Long-eared Owl	<i>Asio otus</i>	-	1	-	-	1
Northern Waterthrush	<i>Parkesia noveboracensis</i>	-	-	-	1	1
Savannah Sparrow	<i>Passerculus sandwichensis</i>	-	-	4	6	10
Song Sparrow	<i>Melospiza melodia</i>	2	8	1	7	18
Spotted Sandpiper	<i>Actitis macularius</i>	2	1	8	4	15

Common Name	Scientific Name	Number of Nests				Total
		DRC		RDZ		
		Off plot	On plot	Off plot	On plot	
Unidentified Sparrow	<i>Melospiza sp.</i>		1	3	3	7
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1	1	-	3	5
Yellow Warbler	<i>Setophaga petechia</i>	1	2	-	3	6
<b>Total</b>		<b>11</b>	<b>29</b>	<b>31</b>	<b>44</b>	<b>115</b>

Six new species were confirmed nesting within the study area this year. Three of the new species were detected in the DRC (American Crow [*Corvus brachyrhynchos*], Black-billed Magpie (*Pica hudsonia*), and Long-eared Owl (*Asio otus*), and three were in the RDZ (American Wigeon [*Mareca americana*], Northern Waterthrush [*Parkesia noveboracensis*], and Savannah Sparrow [*Passerculus sandwichensis*]). Additionally, Canada Goose (*Branta canadensis*) and Killdeer (*Charadrius vociferus*) were observed nesting upstream of the dam for the first time during this program.

In the DRC, the species with the most nests detected were Song Sparrow (10 nests), Cedar Waxwing (*Bombycilla cedrorum*, 6 nests), and Killdeer (*Charadrius vociferus*, 4 nests) (**Table 3.5**). In the RDZ, the species with the most nests detected were Spotted Sandpiper (*Actitis macularius*, 12 nests), Savannah Sparrow (10 nests), and Song Sparrow (8 nests) (**Table 3.5**).

Common Nighthawk (*Chordeiles minor*), federally listed as Threatened and provincially Blue-listed, was detected nesting on two plots within the RDZ and two off plot locations within the DRC (**Appendix A**).

### 3.3.3 Nest Habitat

Species richness and nest density was highest on Shrub plots and comparatively low on plots of other habitat strata (**Table 3.6**).

**Table 3.6 Species Diversity and Nest Density Across Plot Habitat Strata**

Habitat Stratum	Number of Nests (n)	Species Richness	Pielou Evenness	Nest Density (nests/ha)			
				DRC	RDZ	Overall	Overall + Territory Mapping*
Tree	2	2	-	0.00	7.51	4.66	14.0
Shrub	47	15	0.86	8.08	8.92	8.45	12.4
Herb	17	7	0.86	0.66	6.38	4.24	4.74
Unvegetated	7	3	0.72	0.41	3.31	0.83	1.06

Two species, Song Sparrow and Northern Waterthrush (*Parkesia noveboracensis*), nested on Tree plots, but both nests were on the ground (**Table 3.7**). One additional forest-nesting species, Black-and-white Warbler (*Mniotilta varia*), nested on the ground just outside of a Tree plot boundary.

Fifteen species nested on Shrub plots. The most common nesting species was Song Sparrow, which nested on or close to the ground, followed by Cedar Waxwing, which nested exclusively in shrubs (**Table 3.7**).

Seven species nested on Herb plots. Savannah Sparrow was the most common, followed by Spotted Sandpiper and Song Sparrow.

Three species were found nesting on Unvegetated plots. Killdeer was the most common with five nests, followed by Canada Goose and Spotted Sandpiper with one nest each.

Song Sparrow and Spotted Sandpiper nested across the widest range of available habitats. Song Sparrow was found nesting within all habitat strata except Unvegetated. Spotted Sandpiper nested on Herb and Unvegetated plots but additional off plot nests for this species were found in shrub and treed habitats.

Common Nighthawk nested on two plots, one Shrub and one Herb, in open areas, as well as off plot locations that were sparsely vegetated.

**Table 3.7 Number of Nests for Each Species Across Plot Habitat Strata**

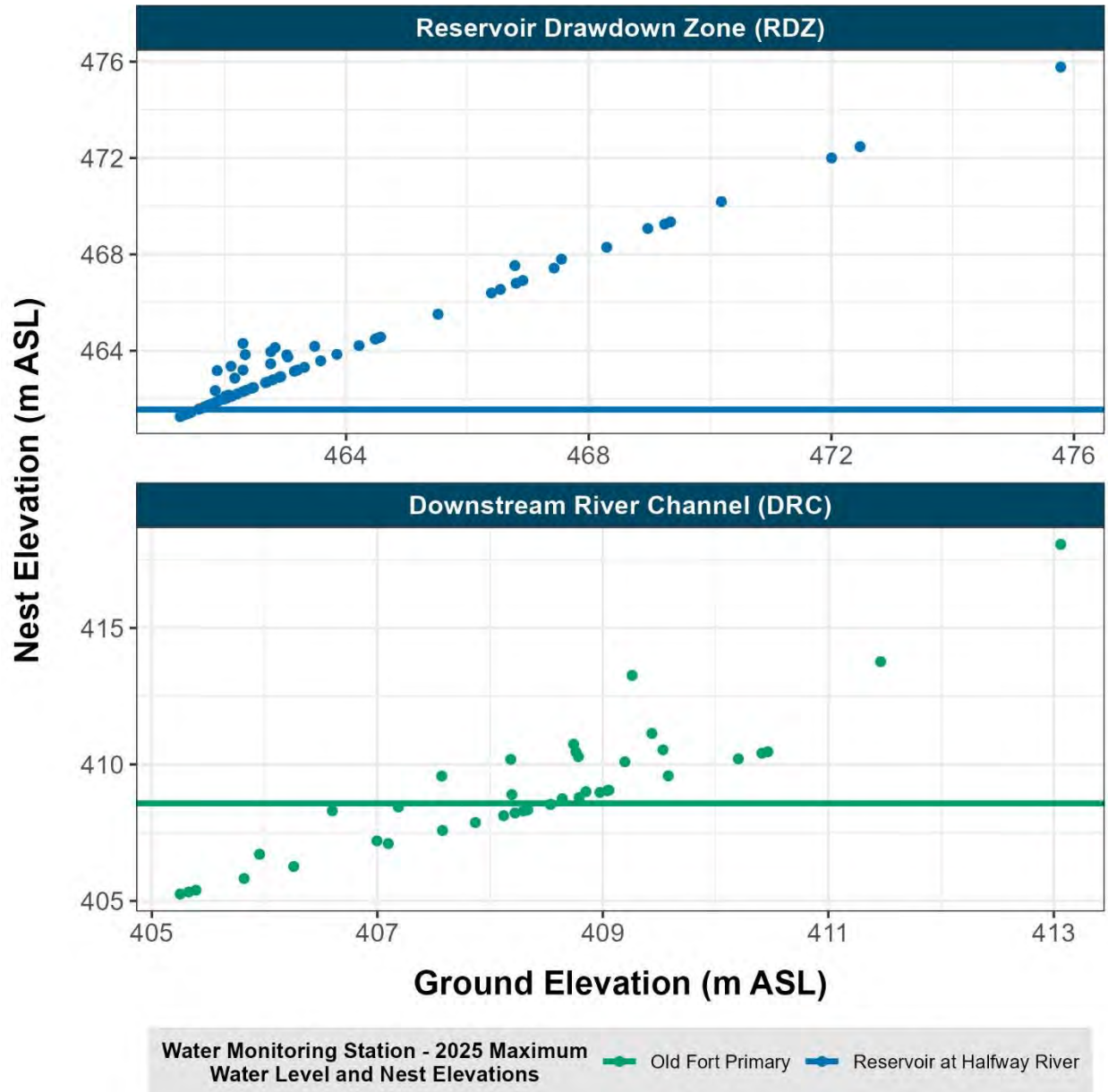
Species*	Tree	Shrub	Herb	Unvegetated
Alder Flycatcher	-	3	-	-
American Crow	-	1	-	-
American Robin	-	1	-	-
American Wigeon	-	-	1	-
Black-billed Magpie	-	1	-	-
Canada Goose	-	1	-	1
Cedar Waxwing	-	7	-	-
Clay-colored Sparrow	-	2	1	-
Common Nighthawk	-	1	1	-
Dark-eyed Junco	-	1	-	-
Killdeer	-	-	1	5
Least Flycatcher	-	1	-	-
Lincoln's Sparrow	-	3	-	-
Long-eared Owl	-	1	-	-
Northern Waterthrush	1	-	-	-
Savannah Sparrow	-	-	6	-
Song Sparrow	1	11	3	-
Spotted Sandpiper	-	-	4	1
Unidentified Sparrow	-	4	-	-
White-throated Sparrow	-	4	-	-
Yellow Warbler	-	5	-	-

**Notes:** \*Scientific names are provided above in **Table 3.5**.

### 3.3.4 Nest Elevation

Nests were located both at and above ground level on nest monitoring plots in both the RDZ and DRC (**Figure 3.2**). Overall nest heights above ground ranged from 0 to 5 m, but most nests were located on the ground (68%). Nest elevations above sea level ranged from 405.2 to 418.1 m in the DRC and 461.3 to 475.8 m in the RDZ. Some nests were found at elevations below the maximum water level measured at nearby water monitoring stations (**Figure 3.2**).

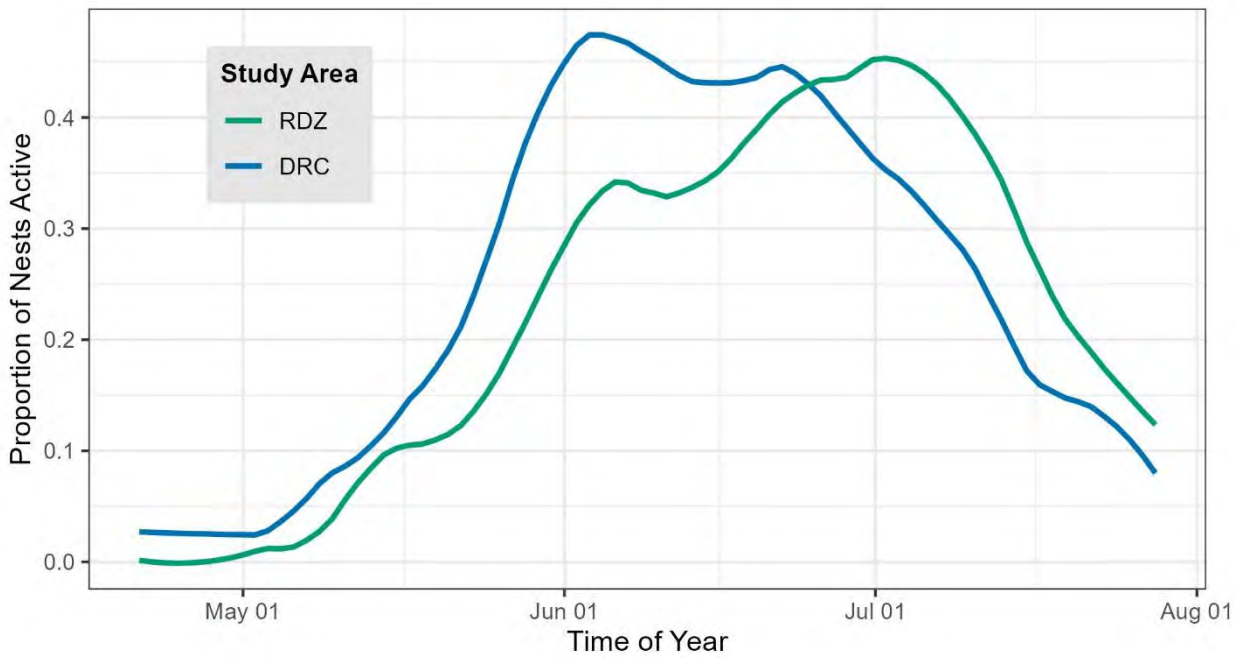
In the DRC, the two Common Nighthawk nests monitored were above the typical high-water mark. One nest in the RDZ was below the maximum normal reservoir level and the other was just above it.



**Figure 3.2** Reservoir Drawdown Zone (RDZ) and Downstream River Channel (DRC) Nest Elevations (Points) and Maximum Water Level (Horizontal Lines) at Water Level Monitoring Stations between April 1 and August 31, 2025

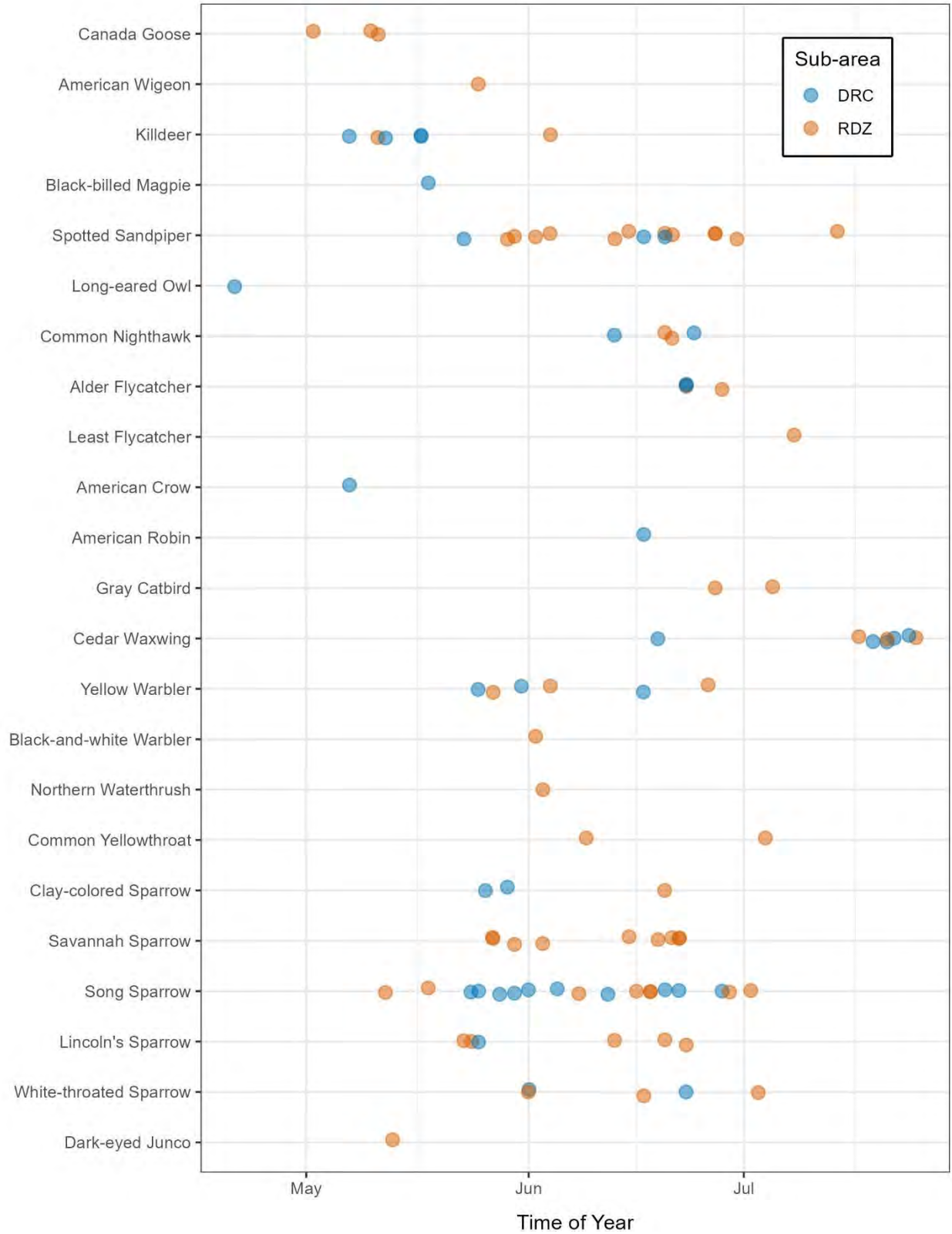
### 3.3.5 Nest Phenology

For both the RDZ and DRC, nesting activity increased sharply in late May and declined in early to mid-July (Figure 3.3). The peak of nesting activity was slightly earlier in the DRC compared to the RDZ. The nest phenology curve is cut off when the field season ended on July 28.



**Figure 3.3** Proportion of Total Monitored Nests Active on Nest Monitoring Plots in the Reservoir Drawdown Zone (RDZ) and Downstream River Channel (DRC) throughout the 2025 Field Season

There were differences in nest timing among species (Figure 3.4). For example, Song Sparrow, Killdeer, and Spotted Sandpiper began nesting in May, whereas Common Nighthawk, Alder Flycatcher, and Cedar Waxwing did not begin nesting until later in June (Figure 3.4). However, for many species, the nest sample size was relatively small (Figure 3.4).



**Figure 3.4** Estimated First Egg Dates for Nests of Species Observed Nesting in the Reservoir Drawdown Zone (RDZ) and Downstream River Channel (DRC) in 2025

### 3.3.6 Nest Outcome

Across the entire study area, 42% of nests detected were considered successful, 43% failed, and 16% had an unknown outcome (**Table 3.8**). The most common cause of nest failure was predation and three nests failed due to flooding (**Table 3.8**).

**Table 3.8 Nest Outcomes – Percentage of Total Nests and in Each Area**

Nest Outcome	RDZ (% of total nests)	DRC (% of total nests)	Overall (% of total nests)
Failed - Abandoned	2.5	5.3	4.3
Failed - Other means	2.5	0.0	0.9
Failed - Unknown means	2.5	2.7	2.6
Failed - Flooded	2.5	2.7	2.6
Failed - Predation	30.0	33.3	32.2
Successful	50.0	37.3	41.7
Unknown	2.5	12.0	8.7
Unknown - End of season	7.5	6.7	7.0

Two of the nests that failed due to flooding were in the RDZ. The first nest was a Spotted Sandpiper nest on an Herb plot that flooded in early June. The second nest was an unidentified sparrow (either Lincoln’s or Song Sparrow) nest on a Shrub plot and was flooded in mid-July. The one nest that failed due to flooding in the DRC was an off plot Spotted Sandpiper nest in Herb habitat strata that was flooded in late July. All three nests that failed due to flooding were on the ground.

All nests of the only at-risk species monitored, Common Nighthawk, were successful.

Nest outcomes for monitored plots were also examined by habitat and a lower percentage of nests on Shrub plots were successful compared to other habitat strata (**Table 3.9**). However, habitat strata other than Shrub had relatively fewer nests (**Table 3.6**) so these data should be interpreted cautiously.

**Table 3.9 Nest Outcomes – Percentage of Total Nests for Each Habitat Stratum**

Nest Outcome	Tree (% of total nests)	Shrub (% of total nests)	Herb (% of total nests)	Unvegetated (% of total nests)
Failed - Abandoned	-	2.1	11.8	14.3
Failed - Other means	-	2.1	-	-
Failed - Unknown means	-	2.1	-	-
Failed - Flooded	-	2.1	5.9	-
Failed - Predation	-	40.4	29.4	14.3
Successful	100	40.4	47.1	57.1
Unknown	-	-	5.9	14.3
Unknown - End of season	-	10.6	-	-

## 4.0 Discussion

Results for the nest monitoring program in 2025 provide key information for addressing the questions of how many migratory bird species and nests are present in the fluctuation zones of the RPZ and DRC, and how many nests are affected by fluctuating water levels. Further years of sampling will continue to enhance this knowledge and improve confidence in the results.

### 4.1 Habitat Classification and Plot Selection

More area was surveyed in the DRC compared to the RDZ due to the longer travel time to access plots in the RDZ and the inclusion of large Unvegetated plots in the DRC. Water levels were relatively low in the DRC compared to previous years which allowed more Unvegetated plots to be surveyed, and this habitat can be surveyed relatively quickly compared to other strata. The RDZ does not contain as much unvegetated habitat as the DRC.

The smaller area of Tree plots surveyed compared to other habitat strata was a result of a low amount of this habitat present in both sub-areas. Additionally, in the RDZ, most treed habitat is above the maximum normal reservoir level, so it is not expected to be affected by water fluctuations, making it a lower priority for surveying. Some treed habitat was surveyed in 2025 to collect some information on what species were nesting in this habitat and in case water levels were higher than expected.

### 4.2 Nest Records

Twenty-three species were detected nesting within the study area in 2025. More species (30) were detected in 2021 and fewer (19) were detected in 2022 (Hemmera 2022; Ausenco 2023). This difference is attributed to the unique spatial and temporal monitoring in 2025. This year was the first year of monitoring in the RDZ rather than the headpond, so the types and distribution of available habitats were different than in previous years. Most notably, there is no longer wetland habitat available in either sub-area because the only known wetland habitat was flooded when the reservoir was filled. Additionally, nest monitoring has occurred over a slightly different time period each year, which affects the specific species that could be monitored since nest timing varies among species (**Section 3.3.5**). This year, monitoring occurred over a longer time period (9 weeks) because it was the first year of sampling in the RDZ and we wanted to collect data across most of the breeding season to inform future years of sampling.

Multiple new species for the study were also detected this year. It is likely that additional species will be observed nesting within both sub-areas in future years of monitoring, particularly in the RDZ since this was the first year it was monitored.

As in previous years, many nests were found off plot. The linear footprint of the plots along the shoreline means that more nest-searching time is spent along a plot edge, thereby increasing the chances that nests detected would be near the plot boundary. Many off plot nests are also found incidentally while walking to or between plots.

Common Nighthawk previously nested in both the HPZ and the DRC and nested in both the RDZ and DRC in 2025. This at-risk species has high breeding site fidelity, suggesting that it will likely nest in these areas in future years if the habitat remains suitable (Ng et al. 2018).

### 4.3 Nest Habitat

As in previous years, species diversity was highest in the Shrub stratum because this habitat hosts a diversity of nest locations (e.g., ground and shrub) suitable for a wide range of species. Nest densities were also higher in more complex habitats. These results match the findings in previous years and for similar multi-species nesting studies (Ausenco 2023; Hemmera 2022, 2020).

The overall number of nests and nest density on Herb plots was higher this year than in previous years. This is attributed to the presence of grassland habitat in the RDZ which attracted Savannah Sparrow. Many plots previously surveyed within this stratum have had sparser herbaceous vegetation that would be less appealing for nesting. The nest density observed for this habitat stratum in the DRC continues to be low.

The territory mapping information provides a useful upper estimate of potential nest density on each habitat stratum. The unadjusted nest densities are generally underestimates because there will always be nesting pairs on plots for which nests are not located. We cannot be sure that the pairs observed on plots for which nests were never found did have nests, but it is reasonable to assume that at least some of them did. This is particularly true for forested habitat because nests in trees are often at higher elevations and, thus, are generally more difficult to detect.

### 4.4 Nest Elevation

In the RDZ, most plots included habitat both below and above the maximum normal reservoir water level (461.8 m) and many nests were above this water level as well as the maximum water level reached in 2025 (461.5 m). The somewhat regular fluctuation of the water level throughout June and July likely limited the availability of lower elevation habitat for nesting. A larger proportion of nests in the DRC are below the 2025 maximum water level for that sub-area.

One of the reasons so many nests are above the maximum water levels in the RDZ is because of the many nests found incidentally outside of nest monitoring plots.

However, the presence of nests below the 2025 maximum water levels demonstrates the potential for nest flooding if those nests are active at the time when the water level is at that elevation (see **Sections 3.3.6** and **4.6**).

### 4.5 Nest Phenology

Nesting activity peaked throughout June, indicating that this is the core of the breeding season, as was the case in previous years and expected based on older data (BC Hydro 2021). Sampling occurred over 9 weeks in 2025 which meant that early and late nesting species were better represented than in previous years.

We detected some early-nesting species whose nests were active when sampling began, but additional nests that were only active prior to the start of sampling may have been missed. Migratory songbird species determined to have begun nesting earlier in May include Song Sparrow and Dark-eyed Junco (*Junco hyemalis*). Yellow Warbler, Clay-coloured Sparrow (*Spizella pallida*), and Savannah Sparrow all initiated nests in late May. Additionally, some Spotted Sandpiper and Killdeer nests, and all Canada Goose nests, were initiated prior to beginning field surveys.

Monitoring until July 28 this year allowed us to capture data on later nesting species like Cedar Waxwing. In previous years, Cedar Waxwing was observed nesting from late June to mid-July, but in 2025 we only observed one Cedar Waxwing nest prior to mid-July. Thus, we would have missed most of their nests if we had ended monitoring earlier and we likely would have found more if monitoring had continued later because many nests found late in the season were in the early stages (e.g., nest-building, egg-laying).

There were also some species, such as Song Sparrow and Spotted Sandpiper, that were observed nesting throughout most of the monitoring period, with later nests likely to be renests after failure or second clutches by successful pairs.

Initiating surveys earlier (e.g., in May) would provide data on the early-nesting species noted above. These data would be particularly valuable for assessing the effects of flooding on nests since most of these species nest on or close to the ground. As described in the Nest Monitoring Plan, the monitoring schedule will be adjusted throughout the study to target the times and locations for which more sampling is needed to characterize the nesting activity within the study area (BC Hydro 2021).

#### **4.6 Nest Outcome**

The failure of 43% of nests was similar to the two previous years of this study (33% failed in 2021 and 43% failed in 2022) and a similar long-term study in Arrow Lakes and Kinbasket Reservoirs (an average of 45% of nests failed) (Hemmera 2020; Ausenco 2023; BC Hydro 2021). Generally, nest failure rates can be quite variable because they are influenced by many factors including habitat, nest placement, seasonality, weather, hatching success, brood parasitism, food availability, and predator population dynamics. Ricklefs (1969) examined nest failure across multiple species of passerines and documented nest failure percentages ranging from 13 to 78.

The primary cause of nest failure was predation, which is typical for nest monitoring studies (Ricklefs 1969; Hemmera 2020; Thompson 2007).

Three nests failed due to flooding and nest flooding occurred in both the DRC and RDZ. Nest flooding was also observed in the DRC in 2021 but not in 2022. In 2021, water levels were higher in the DRC throughout the breeding season and increased in late June when many species were nesting. In 2022, water levels were lower overall and generally decreased throughout most the breeding season, making nest flooding less likely. In 2025, water levels were generally lower than in 2021, but fluctuations occurred throughout the breeding season.

Nest flooding was observed in the RDZ and was observed in the HPZ in 2021 but not 2022. Although both areas are above the dam site, the footprint and operations of the former river and current reservoir are substantially different, so the water levels and potential effects cannot be compared.

One of the nests of the only at-risk species monitored, Common Nighthawk, was below the maximum reservoir elevation level, indicating potential for nest flooding to affect that species.

The percentage of nests with unknown outcomes due to the monitoring season ending was smaller (7%) in 2025 than in 2021 (11%) and 2022 (21%) because the field season ended later, allowing more nests to be monitored to completion. The nests with unknown outcomes still contribute valuable information to the study about the numbers of species and nests, nest density, nest phenology, and the potential for nest flooding within the study area.

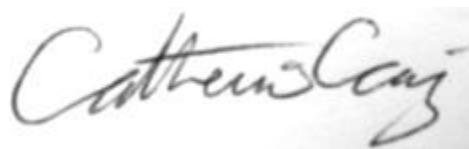
Future, multi-year analyses will examine daily nest survival for more common species, such as Spotted Sandpiper and Song Sparrow, for comparison with similar studies (Hemmera 2020). Once the habitat mapping has been refined, potential numbers of nests will be estimated for the full study area based on the nest densities for each habitat stratum and the amount of available habitat within the study area. Estimates will also be made of the total potential impact of nest flooding in the study area based on elevation and habitat availability.

## 5.0 Closure

This work was performed in accordance with Contract No. 4500023118 between Ausenco Sustainability Inc., a wholly owned subsidiary of Ausenco Engineering Canada Inc. (Ausenco), and BC Hydro, dated June 1, 2021 (Contract). This report has been prepared by Ausenco, based on fieldwork conducted by Ausenco, for sole benefit and use by BC Hydro. In performing this work, Ausenco has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the report was produced. The conclusions and recommendations contained in this report are based upon the applicable guidelines, regulations, and legislation existing at the time the report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

We sincerely appreciate the opportunity to have assisted you with this project and if there are any questions, please do not hesitate to contact the undersigned by phone at 604.669.0424.

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Report reviewed by:  
**Ausenco Sustainability ULC**



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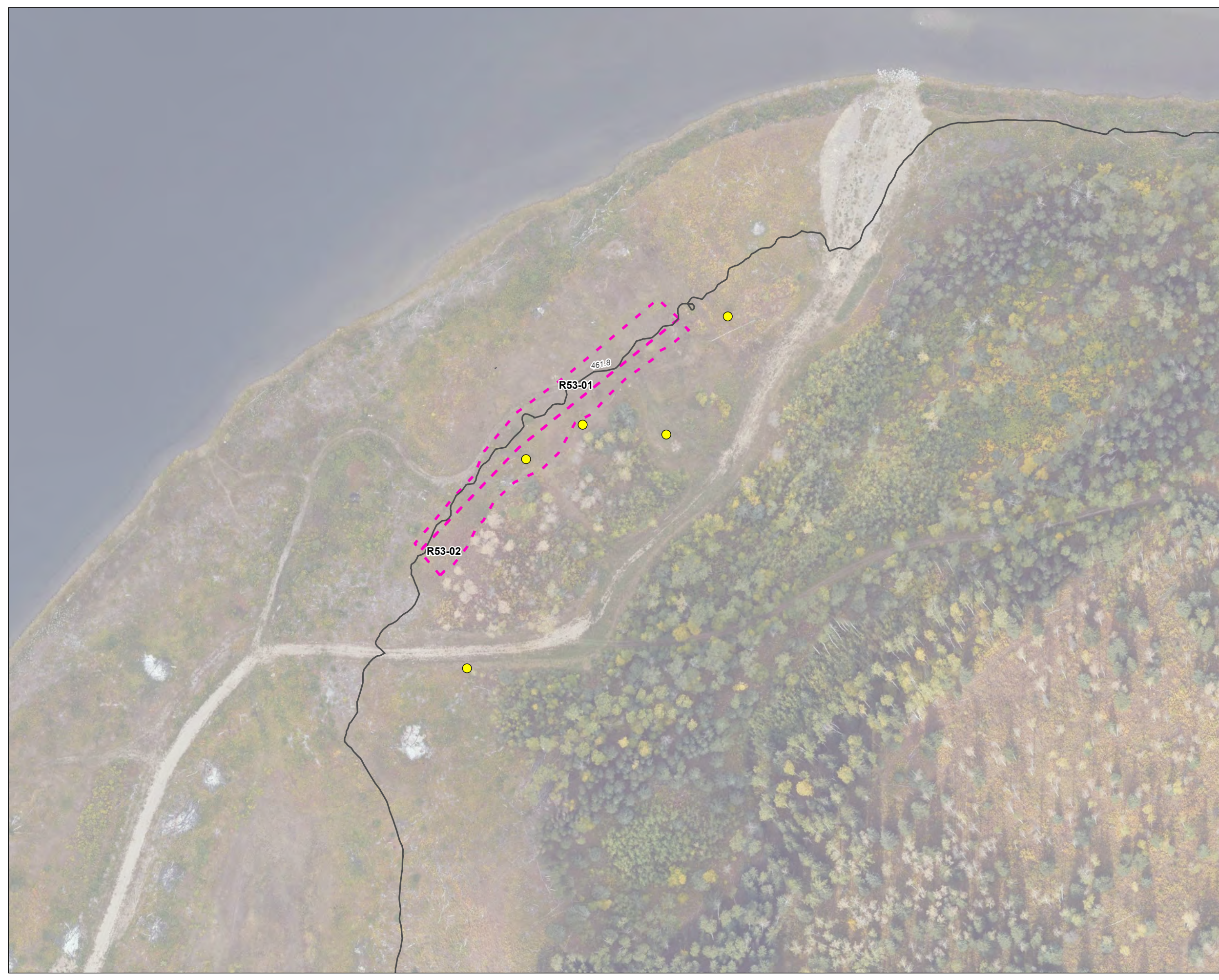
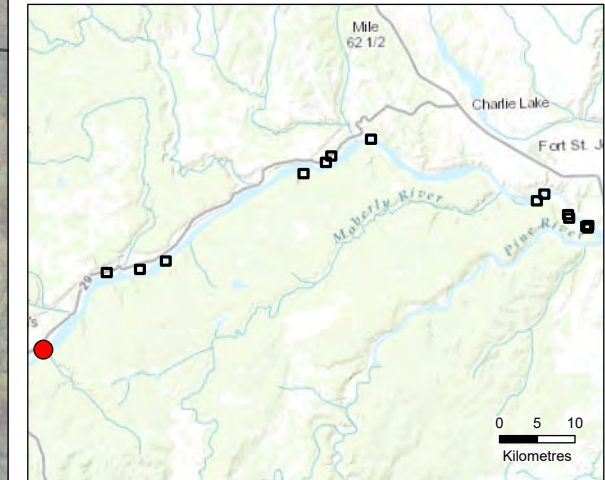
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# Appendix A

## Nest Monitoring Plots

2025 Nest Monitoring Plots –  
R53-01 and R53-02



Legend

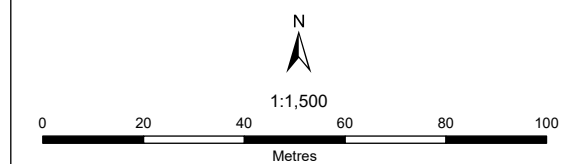
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- Nest Monitoring Plot

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

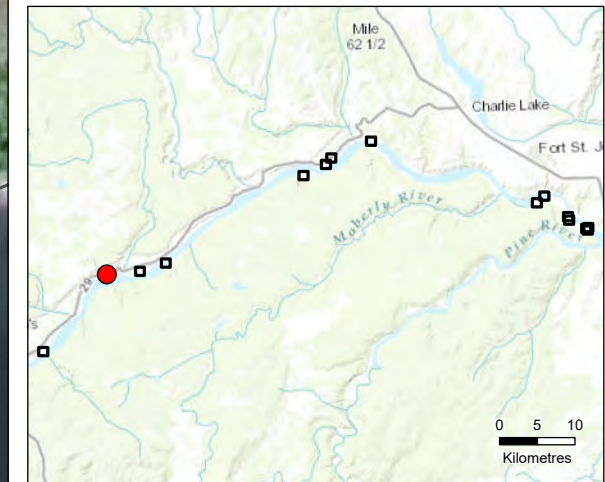
- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map



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2025 Nest Monitoring Plots –  
R40-01, R40-02, and R40-03



Legend

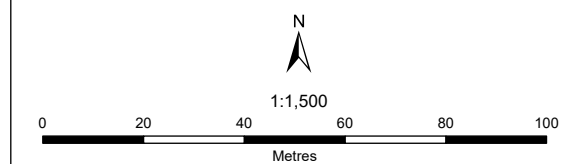
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- ▭ Nest Monitoring Plot

Notes

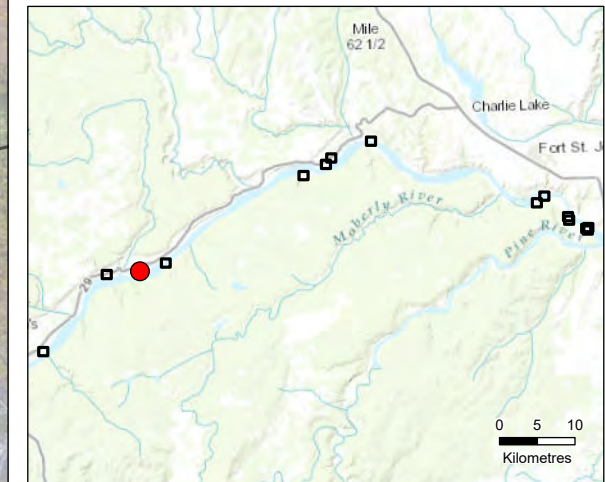
1. All mapped features are approximate and should be used for discussion purposes only.
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Sources

- Aerial Image: © Google Earth, 2025. Date of Imagery: 08/28/25
- Inset Basemap: ESRI World Topographic Map



2025 Nest Monitoring Plots –  
R37-01 and R37-02



Legend

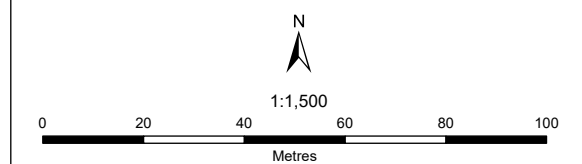
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- Nest Monitoring Plot

Notes

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Sources

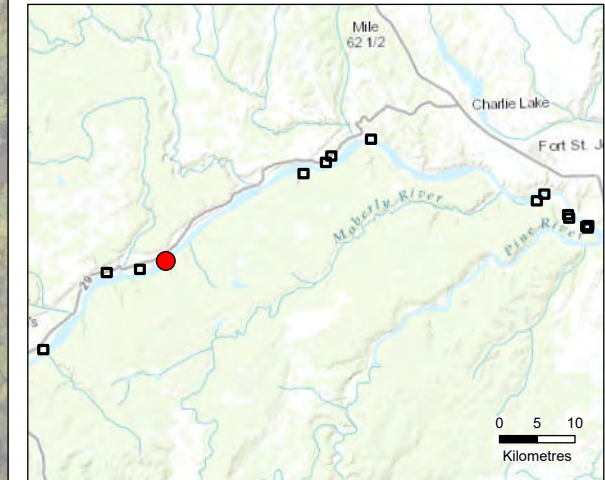
- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map



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2025 Nest Monitoring Plots –  
R35-01 and R35-02



Legend

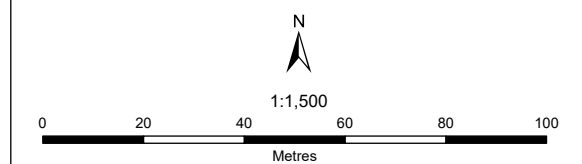
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- Nest Monitoring Plot

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

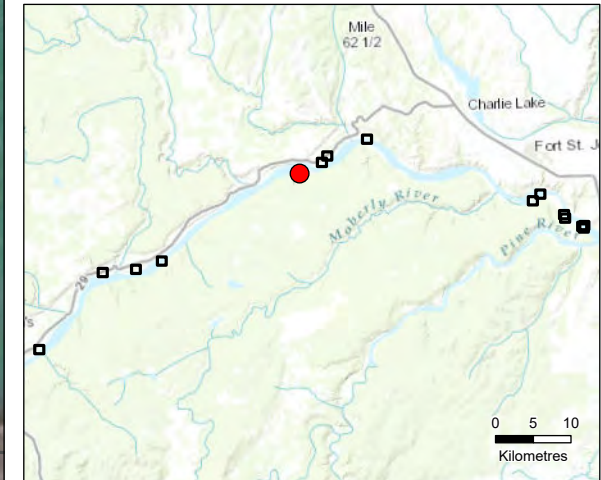
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2025 Nest Monitoring Plots –  
R24-01



Legend

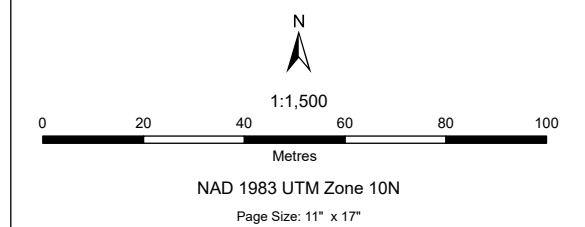
-  Common Nighthawk Nest Location
-  Nest Location
-  Maximum Normal Reservoir Level (461.8 m)
-  Nest Monitoring Plot

Notes

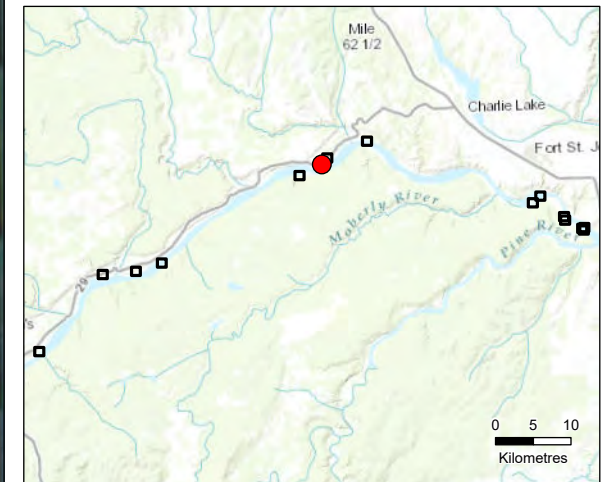
1. All mapped features are approximate and should be used for discussion purposes only.
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Sources

- Aerial Image: © Google Earth, 2025. Date of Imagery: 08/28/25
- Inset Basemap: ESRI World Topographic Map



**2025 Nest Monitoring Plots –  
R22-01, R22-02, R22-03, and R22-04**



**Legend**

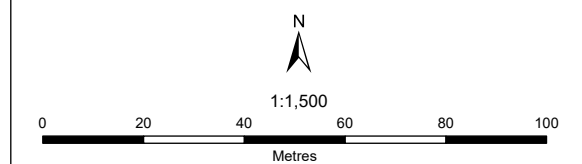
- Common Nighthawk Nest Location
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- ▭ Nest Monitoring Plot

**Notes**

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

**Sources**

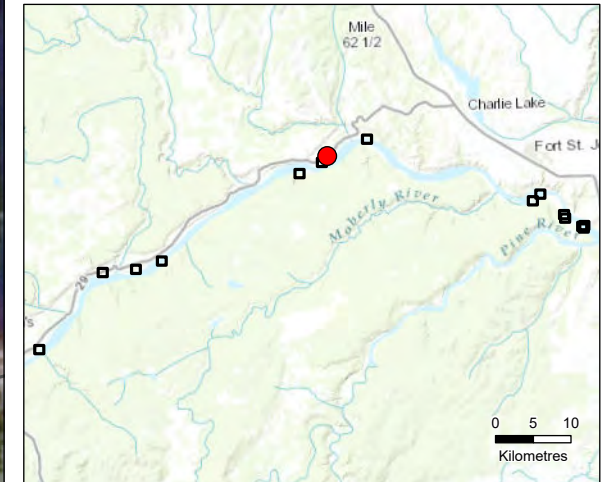
- Aerial Image: © Google Earth, 2025. Date of Imagery: 08/28/25
- Inset Basemap: ESRI World Topographic Map



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Page Size: 11" x 17"

**2025 Nest Monitoring Plots –  
R21-01, R21-02, and R21-03**



**Legend**

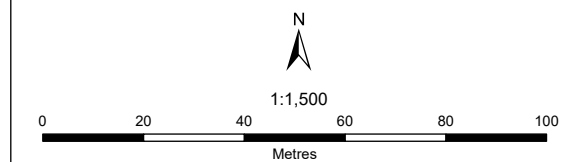
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- ▭ Nest Monitoring Plot

**Notes**

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

**Sources**

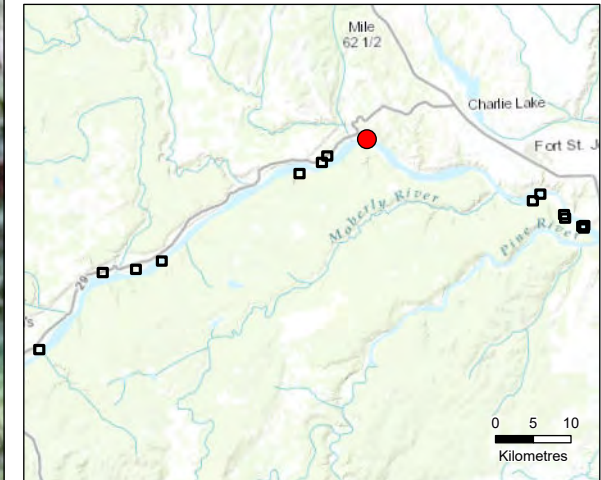
- Aerial Image: © Google Earth, 2025. Date of Imagery: 08/28/25
- Inset Basemap: ESRI World Topographic Map



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Page Size: 11" x 17"

2025 Nest Monitoring Plots –  
R14-01



Legend

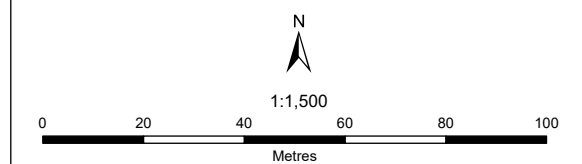
- Nest Location
- Maximum Normal Reservoir Level (461.8 m)
- Nest Monitoring Plot

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

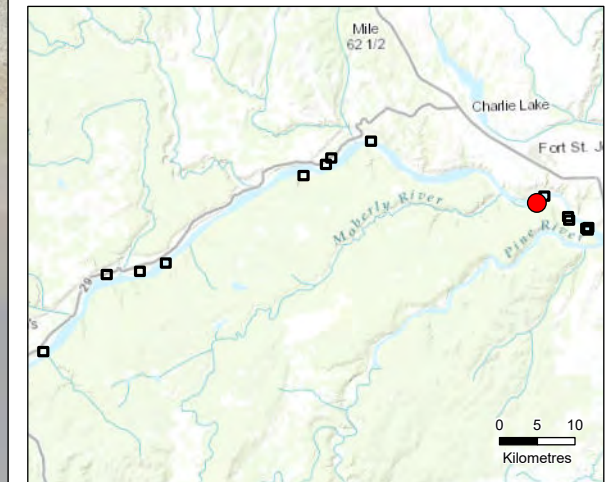
- Aerial Image: © Google Earth, 2025. Date of Imagery: 08/28/25
- Inset Basemap: ESRI World Topographic Map



NAD 1983 UTM Zone 10N

Page Size: 11" x 17"

2025 Nest Monitoring Plots –  
25 and 26



Legend

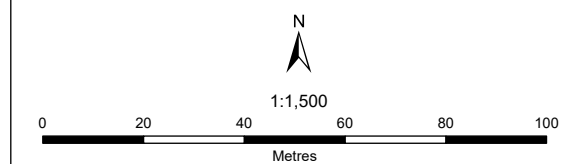
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- Maximum Normal Reservoir Level (461.8 m)
- Nest Monitoring Plot

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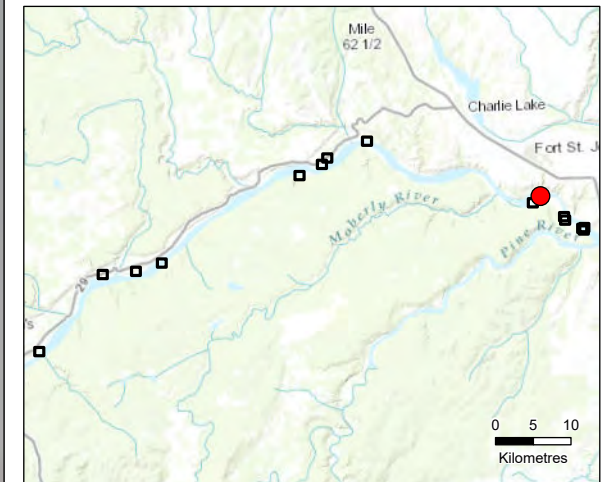
Sources

- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map





NAD 1983 UTM Zone 10N  
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2025 Nest Monitoring Plots –  
27 and 28



Legend

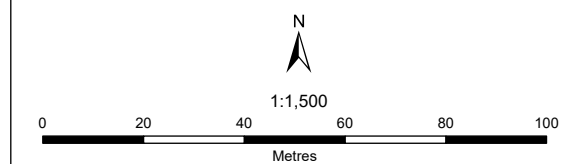
-  Nest Location
-  Nest Monitoring Plot

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NAD 1983 UTM Zone 10N

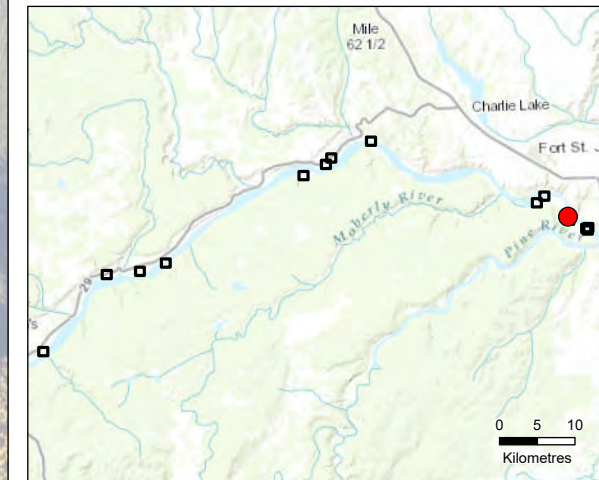
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Production Date: Apr 2, 2026

Appendix A-10

**2025 Nest Monitoring Plots –  
30, 31, and 32**



**Legend**

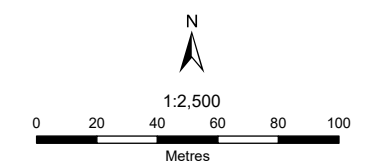
-  Nest Location
-  Nest Monitoring Plot

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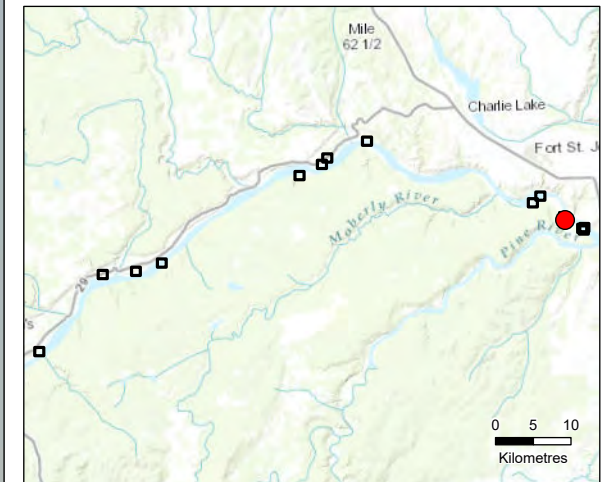
**Sources**

- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map



NAD 1983 UTM Zone 10N  
Page Size: 11" x 17"

2025 Nest Monitoring Plots –  
32, 33



Legend

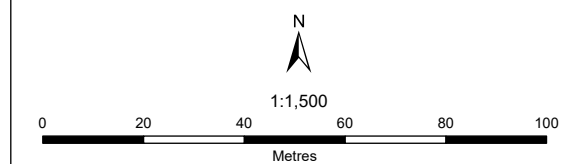
- Maximum Normal Reservoir Level (461.8 m)
- █ Nest Monitoring Plot

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Sources

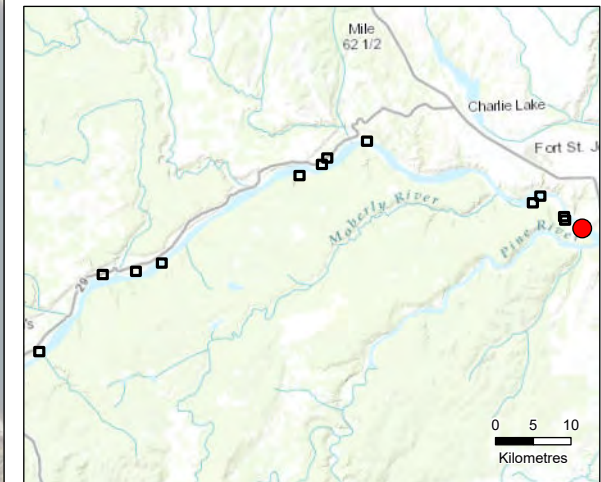
- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map





NAD 1983 UTM Zone 10N

Page Size: 11" x 17"

2025 Nest Monitoring Plots –  
34, 35, 36, and 37



Legend

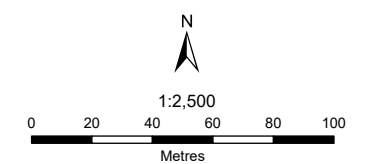
-  Nest Location
-  Nest Monitoring Plot

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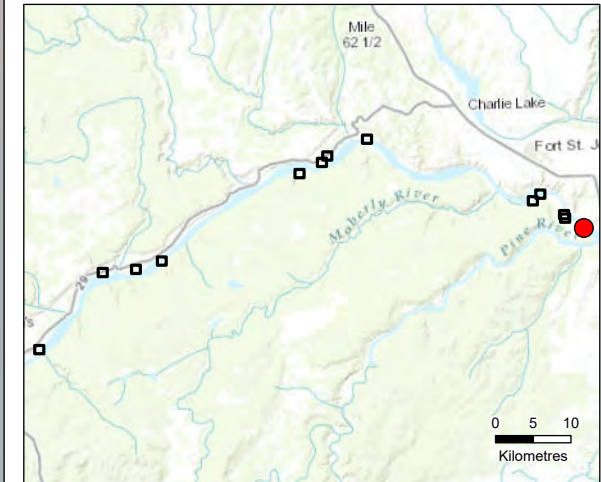
Sources

- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map





NAD 1983 UTM Zone 10N  
Page Size: 11" x 17"

2025 Nest Monitoring Plots –  
34, 35, 36, and 37



Legend

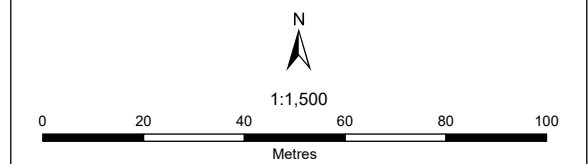
-  Nest Location
-  Nest Monitoring Plot

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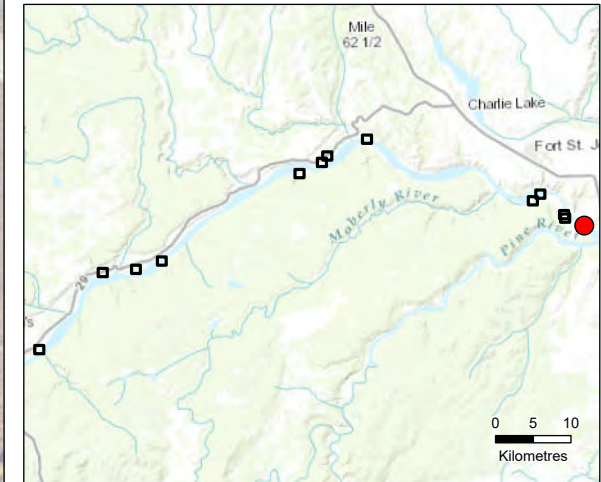
- Aerial Image: BC Hydro, 2023
- Inset Basemap: ESRI World Topographic Map





NAD 1983 UTM Zone 10N

Page Size: 11" x 17"

**2025 Nest Monitoring Plots –  
34 and 36**



**Legend**

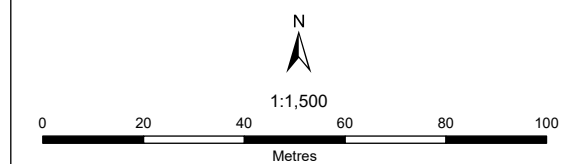
-  Nest Location
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## **Appendix 6. Non-wetland Migratory Bird Habitat Program Closure Memo**

## MEMO

**To:** Dana Eye and Jayme Brooks, Environment and Climate Change Canada;  
Carl Johansson and Nicolas Courville, Impact Assessment Agency of Canada

**From:** Brent Matsuda, Vegetation and Wildlife Program Manager, Site C

**CC:** Greg Scarborough, Environmental Manager, Site C  
Karen von Muehldorfer, Regulatory Manager, Site C

**Subject:** Site C Non-wetland Migratory Bird Habitat Program and status of compliance with FDS Conditions 10.1, 10.2, and 10.3.4.

**Date:** September 11, 2025

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### 1.0 Introduction

In 2015 BC Hydro developed the Site C Clean Energy Project's ('the Project') Vegetation and Wildlife Mitigation and Monitoring Plan (VWMMP) to describe the mitigation, offsetting and monitoring measures to reduce the overall impacts of the Project on vegetation and ecological communities and wildlife resources.

Per Conditions 10.1 and 10.2 of the Project's Federal Decision Statement (FDS; Condition 10 attached in Appendix 1), the VWMMP included a sub-plan to address potential effects of the Project on non-wetland migratory bird habitat ('the Plan'). Non-wetland migratory birds are a broadly defined and encompassing group comprising several species that may use open gravel flats, various non-vegetated areas, grasslands, shrublands, immature forests, mature forests, riparian areas, forested riparian areas and even treed and shrub-dominated wetlands for nesting, feeding, and resting (e.g., see Photos 1 to 12 in Appendix 2). Despite the descriptive name of "non-wetland," several species will also use wetland habitat for feeding and sometimes for breeding if conditions are appropriate. Many species will occupy habitat upland and/or are closely tied to the riparian zones of wetlands.

Conditions 10.3.1 to 10.3.3 of the FDS require that,

*The Plan shall include:*

- 10.3.1. *non-wetland migratory bird habitat baseline conditions for habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact;*
- 10.3.2. *migratory bird abundance, distribution and use of non-wetland habitat;*
- 10.3.3. *measures to mitigate the changes in aquatic and riparian-related food resources and other habitat features associated with a change from a fluvial to a reservoir system;*

Compliance with all components of FDS Condition 10 is described the 2024 VWMMP Annual Report, available at: [Vegetation-and-Wildlife-Mitigation-and-Monitoring-Plan-2024-Annual-Report-Part-1-Appendices-1-5.pdf](#) (Part 1) and [Vegetation-and-Wildlife-Mitigation-and-Monitoring-Plan-2024-Annual-Report-Part-2-Appendices-6-14.pdf](#) (Part 2).

<https://www.sitecproject.com/sites/default/files/Vegetation-and-Wildlife-Mitigation-and-Monitoring-...>

The purpose of this Memo is to provide an update on BC Hydro's compliance with Condition 10.3.4 of the FDS and describe how the compensation offsetting efforts satisfy compliance conditions for closure of Condition 10.

Condition 10.3.4 states that the Plan shall include, "compensation measures to address the unavoidable loss of non-wetland migratory bird habitat, including habitat associated with the Canada Warbler, the Cape May Warbler and the Bay-Breasted Warbler." These species were presumably designated due to their association with non-wetland habitat and their federal or provincial status as species of concern. The Canada Warbler (*Cardellina canadensis*) is federally listed as threatened under Schedule 1<sup>1</sup> of the *Species at Risk Act* (SARA) and is provincially blue-listed<sup>1</sup>, the Cape May Warbler (*Setophaga tigrina*) is also provincially blue-listed, and the Bay-breasted Warbler (*Setophaga castanea*) is provincially red-listed<sup>1</sup>.

Specifically, this Memo describes:

- BC Hydro's approach to meeting compensation requirements;
- Description of the Habitat Accounting Framework – the methods used to assess and measure the extent of NWMBH impacted in terms of area and habitat types now that the Project's land development activities are completed (Section 4);
- Details of the calculations of NWMBH loss impacts in terms of area and types and how compensation will be achieved by establishing protective covenants on BC Hydro-owned properties into perpetuity for non-wetland migratory birds; and
- Considerations on how the loss of NWMBH has also been offset by the rebuilding, restoring, and creation of new wetlands and terrestrial restoration and reclamation programs conducted throughout the Project footprint as various construction activities finished.

## 2.0 Non-wetland Migratory Bird Habitat Compensation Approach

Reservoir filling was completed in November 2024 and the Site C Project is now in Operation. Given completion of reservoir fill and land development impacts, BC Hydro has now calculated the amount of non-wetland migratory bird habitat (NWMBH) lost as a result of the Project.

The Site C Clean Energy Project has resulted in clearing and flooding a large footprint within the Peace River valley and adjacent areas. Prior to reservoir fill and full assessment of potential environment effects of the Project, BC Hydro acquired several properties along the reservoir and in adjacent areas for safety, flooding, and construction purposes. Many of these properties contain suitable habitat for non-wetland migratory birds. With construction completion and

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<sup>1</sup> SARA status: 1 = Schedule 1 = Official list of federal wildlife species at risk. T=Threatened; E = Endangered; SC = Special Concern.

BC Provincial Listing includes species designated as red- or blue-listed (CDC 2025).

Red List: Includes any native species that have, or are candidates for, Extirpated, Endangered, or Threatened status in BC.

Blue List: Includes any indigenous species and subspecies considered to be of special concern in BC. These species are of special concern due to characteristics that make them sensitive to human activities or natural events.

reservoir filling, BC Hydro has reassessed the availability of these properties and their potential value to contribute to the NWMBH compensation program.

As such, BC Hydro's approach to NWMBH compensation consists of the acquisition of properties for this purpose and/or the establishment of covenants or other protections on existing BC Hydro-owned properties such that they will continue to provide NWMBH into perpetuity regardless of ownership. In addition, restoration and creation of wetlands, and reclamation of areas impacted by Project construction were conducted throughout the Peace Region, but were not factored into the calculations for compensation credit. Each of these approaches are described below.

#### Property Acquisition

To date, BC Hydro has purchased and manages three properties (i.e., Marl Fen, Rutledge and Wilder Creek) for environmental values that were retained partly to provide habitat for non-wetland migratory birds. These properties comprise three land parcels totaling 637 hectares (ha) for Marl Fen, five parcels totaling 208 ha for Rutledge, and seven parcels totaling 423 ha for Wilder Creek. Collectively these parcels are being managed for values for rare plants and wildlife, including Ungulate Winter Range (UWR) and NWMBH. Management plans for those properties were initially written in 2015 (Marl Fen, Rutledge) and 2016 (Wilder), with updates to the management plans included in the 2024 VWMMP Annual Report (BC Hydro 2025).

#### Property Covenants

In December 2024, BC Hydro proposed to use BC Hydro-owned properties containing suitable habitat for non-wetland migratory birds, including the three warbler species of concern, to contribute to the program by committing to retain and protect the parcels with NWMBH. Seven forested land parcels totalling 65 ha near Taylor, BC were initially proposed as a concept approach to the Vegetation and Wildlife Technical Committee<sup>2</sup> with no objections received. As such, BC Hydro has subsequently identified 23 other land parcels of varying sizes surrounding the Site C footprint that are suitable for the program. There are also 17 additional parcels from the proposed Ungulate Winter Range (UWR) compensation properties that contains suitable NWMBH. BC Hydro will place covenants, restrictions or other measures on these properties to provide compensation habitat for wildlife and NWMBH lost as a result of reservoir fill.

#### Assessment of BC Hydro Properties

As a locally based Qualified Environmental Professional (QEP) firm, BC Hydro retained Eco-Web Ecological Consulting Ltd. (Eco-Web) to conduct the assessment of these properties working with Tetra Tech Canada (Tetra Tech) as they conducted the initial Habitat Accounting Framework assessment for NWMBH in 2021 (see details in Section 4.0).

BC Hydro provided a list of their privately-owned parcels in and around the dam and reservoir footprint to Eco-Web. After an initial desktop assessment review, ground-visits were conducted

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<sup>2</sup> Aka. VWTC; Joint committee of provincial and federal agency biologists required by the Project's Conditional Water Licence.

to most sites by QEPs Dan Webster R.P.Bio.<sup>3</sup> (Eco-Web) and Brent Matsuda R.P.Bio. (BC Hydro) on April 16, 2025, to review and confirm suitability of the previously assessed sites for inclusion.

The desktop review entailed plotting the parcel boundaries and overlaying them against recent aerial photography which provided the general remaining forest per parcel, cultivated land, non-vegetated land and where applicable, the available reclaimed grass/shrubland habitat that would be suitable for various species. Additional GIS layers were generated for the three warbler species of concern (see below) using the Vegetation Resource Inventory (VRI) layers and this area was calculated separately from the remaining forest.

Habitat for the three warbler species of concern (Warbler Habitat) has been generally classified as mature to old growth deciduous trees interspersed with mature – old growth conifers, dense understory, with riparian woodlands or proximity to riparian or riverine areas (COSEWIC 2020, Cooper and Beauchesne 2004a,b). These parcels also contain habitat for several other non-wetland migratory bird species in the form of grasslands, shrubland, intermediate-aged forests, wetlands, cultivated land and even non-vegetated land to a certain extent. This allowed the evaluation the entire grouping of parcels for NWMBH for multiple species.

Habitats for the three warbler species assessed were based on their habitat specifics below.

**Canada Warbler:** Mature to old aspen (80+ yrs, structural stages 5-8). Ideally where there are canopy gaps and a dense shrub layer. These sites are often rich and moist sites.

**Cape May Warbler:** Mature to old spruce (white or hybrid) stands (80 + yrs, structural stages 5-8). Includes mixed stands (spruce with aspen or balsam poplar) of similar age.

**Bay-breasted Warbler:** Similar to Cape May Warbler, mature to old spruce (white or hybrid) stands (80+ yrs, structural stages 5-8). Includes mixed stands (spruce with aspen or balsam poplar) of similar age.

Previously assessed UWR properties were reviewed from field notes, BC Hydro reports, TEM data and the QEP's knowledge of the properties. The data from the desktop review and field visit was used to break up each parcel into non-vegetated area, cultivated areas, grass/shrub habitat, warbler habitat, wetlands, and other forest habitat. These were then cross-referenced with the 16 classes of TEM habitat and refined down into seven simpler habitat classes as per the Habitat Accounting Framework (see Section 4.0). The warbler habitat was calculated separately to include mature coniferous and deciduous forest.

Within these properties, three small wetlands and the Marl Fen wetland were assessed to provide 52 ha NWMBH and was included in the area totals.

During ground-truthing for forested sites, the warbler habitat on each property was visually verified for accuracy and the remaining forest and grassland and/or shrubland assessed for breeding bird potential. Two properties could only be accessed over private land so were not ground-truthed but were known to contain suitable habitat from the aerial imagery and previous investigations.

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<sup>3</sup> R.P.Bio. = Registered Professional Biologist; Professional designation title legally reserved and used only for registrants of the College of Applied Biology in British Columbia.

### Additional Considerations

Since 2020, BC Hydro has worked with Ducks Unlimited Canada (DUC) to restore or create 269.7 ha of wetland offsets among five wetlands in the Peace Region. Of these five, Golata Ranch was a new wetland built on agricultural land where no wetland previously existed, comprised of ~50 ha marsh/sedge wetland across a seven-hectare pond with 14 smaller ponds of varying sizes. Although these wetlands were initially developed for Site C's Wetland Mitigation and Compensation Program, vegetation developing on the periphery of these wetlands and their corresponding upland areas also support non-wetland migratory birds by providing nesting and foraging habitat for several species. With the completion of a new 35 ha wetland complex currently underway in Area A at the Site C dam site, 304.7 ha of wetlands will have been created, restored, or rebuilt by December 2027. Despite the habitat that this also provides for non-wetland migratory birds, this amount has not been included in the calculations for NWMBH offsetting.

Similarly, ~680 ha of terrestrial habitat has been restored to date through the Site C Reclamation program (Matt Barnette, BC Hydro Reclamation Manager, personal communication). Physical reclamation of Central Area A is scheduled to be complete by October 31, 2025 with 163 ha considered as current active reclamation, and an estimated 303 ha still planned. In these physically reclaimed areas, 194,000 native seedlings have been planted at site, and 180,000 seedlings are currently growing in nurseries for planting in May 2026. In addition, a further 276,000 seedlings are planned to be planted through to 2029. Hence the amount of NWMBH will increase as time progresses and reclamation processes transition into natural regeneration.

## **4.0 Habitat Accounting Framework**

Tetra Tech (2021) developed a compensation accounting framework for NWMBH based on an accounting currency of bird habitat value. This value is calculated for each bird species based on estimates of population density, probability of occurrence, or incidence of occurrence. Absolute densities are standardized to relative densities per species, where the total across all habitats adds up to 1 for each species. Standardized relative densities of each species are then summed per habitat providing a habitat value coefficient. This represents the cumulative relative importance of each habitat for each bird species which is further standardized to sum to 1 across all habitats. The standardized habitat value coefficients can then be converted into Habitat Value Hectares (HVH) for the footprint and compensation sites to determine residual effects of the Project. HVH for the footprint was then calculated by multiplying the standardized habitat value coefficients by the area of each habitat within the footprint. A single index to measure non-wetland migratory bird offsets can then be generated by combining the habitat value coefficients for all birds. These calculations for the compensation offset parcels were then used to compare the Project impact footprint HVH to the offset HVH. Thus, spatial area hectares are taken into account when calculating the HVH which provides a more qualitative relative assessment of impacted versus offset areas.

For the post-construction footprint, using the updated bird habitat value worksheet, Tetra Tech (2025a,b) was able to generate standardized measures of species habitat value. This was broken down by the various habitats within the Project footprint to determine an area of each habitat in the footprint and the footprint habitat value area. The offset areas were then compared to the

standardized combined habitat value coefficient to determine the offset areas habitat value area and an offset index ratio.

The parcels reviewed in this Memo were assessed for NWMBH whether the habitat could be used by a few or several of the non-wetland migratory bird species commonly found along the Peace River. The desktop review indicated large forested and grassland areas that would be suitable, which was field-verified by the QEPs. Over time, reclamation areas will produce more grass and shrubs, eventually progressing to a forested state if left undisturbed. Non-vegetated areas will also be used by non-wetland migratory birds, including nesting and foraging which will increase over time. Formal bird surveys were not conducted so the potential Warbler Habitat was not verified for the presence of the three warbler species of concern, although the assessment was based on the habitat matching the life requisites for these species.

Some wetland areas were identified which also contained habitat for non-wetland migratory birds. Open water and sedge areas were excluded from these calculations. Songbird surveys and nest monitoring programs conducted to date for FDS Condition 10.3.2. (monitoring *migratory bird abundance, distribution and use of non-wetland habitat*) have detected the presence of the three warbler species of concern (mainly Canada Warbler) in forested areas not necessarily considered to be high quality habitat.

## 5.0 Results

The Warbler Habitat polygons reviewed were confirmed to be accurate and contained moderate to high quality nesting habitat for the three warbler species of concern. The remaining forested areas and grass/shrublands were noted to contain habitat suitable for a wide range of non-wetland migratory bird species. These habitats included immature aspen/spruce forest, willows and shrubs and grasses for ground-nesting species. The main portions of cultivated fields originated from the Marl Fen property, Rutledge, Wilder, and the UWR compensation properties and some on the conveyor belt property above the dam site. Non-vegetated areas were assessed as having low influence, but still breeding potential for some species (e.g., Corvids, some songbirds, shorebirds such as Killdeer *Charadrius vociferus*).

Table 1 below presents a summary of the areas initially identified and then confirmed during the field assessment on April 16, 2025.

Table 1. General habitat classes and total offset area compared to offset habitat value area.

Habitat General Class	Total Offset Area (ha)	Offset Habitat Value (ha)
Coniferous	160.1	11.6
Deciduous	606.0	81.9
Riparian Forest	4.6	0.2
Wetland	54.0	3.3
Dry Slopes	362.8	18.3
Cultivated	924.5	31.9
Non-Vegetated	73.5	3.1

<b>Total Non-wetland Migratory Bird Habitat (ha)</b>	<b>2,185.5</b>	<b>150.3</b>
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Table 2 presents a breakdown by habitat class of the Project footprint impacts which initially totaled 10,956 ha but when anthropogenic and water are excluded, amounts to 7,783.7 ha. The area of habitat lost in the footprint pertains to the permanent footprint of the dam infrastructure and reservoir fill area and excludes any temporary reclamation areas. Footprint calculations were based on the March 2025 revised footprint with the 2013 ecosystem mapping used for calculations for consistency. The proposed BC Hydro offset properties totaled 2,297.5 ha but when anthropogenic and water were excluded, the total amounts to 2,185.5 ha. This comprises an area-based offset ratio of 28% (Tetrattech 2025b).

In Table 1, habitat for the three warbler species of concern were not broken down into “mature to old” coniferous and deciduous forest which is more specific to breeding. Such habitat would only amount to 56.3 ha of the total offset area for the three warbler species. However, when considering habitat that could be used for the three warbler species for any life stage, of the 7,783.7 ha Project impact footprint, the HVH for the three warbler species of concern totaled 514.3 (Table 3). The offset area HVH was calculated to be 76.0 which resulted in an offset ratio of 14.8% specifically for the three warbler species.

The offset habitat value area was calculated by multiplying the combined habitat values provided in Appendix 3 (Tetra Tech 2025a). This offset habitat value is the amount of the area that is actively used by the various non-wetland migratory bird species with the value of the habitat for non-wetland migratory birds based on bird density/occupancy recorded during baseline surveys (Tetrattech 2025a; see Appendix 3 for breakdown by bird species).

Overall, the HVH for the Project impact footprint was 556.7 and the HVH for the offset areas totaled 150.3, providing an offset ratio of 27% for NWMBH (Appendix 3).

### **Summary**

Based on the assessed amount of 7,783.7 ha of impacted NWMBH lost, 2,185.5 ha of protected offset habitat parcels results in 28% compensation. Based on HVH, 556.7 was impacted and 150.3 will be offset, resulting in 27% compensation. Further breakdown for the three warbler species of concern indicated that 514.3 HVH of habitat was impacted and 76.0 HVH compensated resulting in a 14.8% offset for the three warbler species of concern.

### **Closure**

As there was no compensation offset amount or ratio specified within FDS Condition 10, BC Hydro believes that this effort, resulting in 2,185.5 ha of compensation offsets, in addition to ongoing uncredited restoration and reclamation programs (e.g., 304.7 ha wetlands, 680+ ha terrestrial habitat), is sufficient to meet the requirements of FDS Condition 10.3.4. As such, we would like to closeout further discussion of FDS Condition 10.

As such, we would like to request any feedback to this Memo by September 30, 2025.

Please let me know if you have any questions.



Sincerely,

A handwritten signature in black ink that reads "Brent Matsuda". The signature is written in a cursive, flowing style.

Brent Matsuda, M.Sc., R.P.Bio.

**Table 2 - Impacted Habitat and Offset Mitigation Property Estimates (from TetraTech 2025b)**

The 2013 ecosystem mapping was used for calculations. The habitat classes listed below are aggregations of ecosystem units. For the BCH parcel offset areas, area estimates were revised based on aerial imagery review to account for land cover changes since 2013.

	Habitat Class																		Total
	Coniferous			Deciduous			Riparian Forest			Wetland				Dry Sl.	Cultiv.	Non-veg.			
	Coniferous-mature forest	Coniferous-young forest	Coniferous-shrub	Deciduous-mature forest	Deciduous-young forest	Deciduous-shrub	Riparian-mixed mature forest	Riparian-mixed young forest	Riparian-mixed shrub	Fen/bog	Wetland-riparian	Wetland-shrub	Wetland-graminoid	Dry slopes	Cultivated	Non-vegetated	Anthropogenic	Water	
	CMF	CYF	CSH	DMF	DYF	DSH	RMF	RYF	RSH	FBS/FBT	WRI	WSH	WGR	DSG/DSS	CUL	NVE	ANT	WAT	
Area Lost in Footprint (ha)	1061.8	579.6	74.9	312.0	1633.8	295.0	237.6	294.0	627.0	42.4	401.4	30.8	56.2	216.7	952.4	968.1	76.6	3095.7	<b>10956.0</b>
Area Lost in Footprint (excludes Anthropogenic and Water (river))	1061.8	579.6	74.9	312.0	1633.8	295.0	237.6	294.0	627.0	42.4	401.4	30.8	56.2	216.7	952.4	968.1	NA	NA	<b>7783.7</b>
Wilder Ck/Rutledge Offset Areas	0	9.73	4.66	0	48.66	13	0	4.63	0	0	0	0	0	177.79	286.7	16.8	0.03	0	<b>562.0</b>
Marl Fen Offset Area	0	84.5	11.7	0.0	37.0	51.2	0.0	0.0	0.0	35.6	0.0	1.8	15.6	0.0	399.5	0	0	0.362	<b>637.2</b>
BCH Parcel Areas Available for Offset	21.6	25.0	2.9	34.7	364.4	57.1	0.0	0.0	0.0	0.1	0.9	0.0	0.0	185.0	238.4	56.7	10.9	100.7	<b>1098.3</b>
Total Offset Area (ha)	<b>21.6</b>	<b>119.2</b>	<b>19.3</b>	<b>34.7</b>	<b>450.0</b>	<b>121.3</b>	<b>0.0</b>	<b>4.6</b>	<b>0.0</b>	<b>35.7</b>	<b>0.9</b>	<b>1.8</b>	<b>15.6</b>	<b>362.8</b>	<b>924.5</b>	<b>73.5</b>	<b>10.9</b>	<b>101.0</b>	<b>2297.5</b>
Total Offset Area minus Anthropogenic	<b>21.6</b>	<b>119.2</b>	<b>19.3</b>	<b>34.7</b>	<b>450.0</b>	<b>121.3</b>	<b>0.0</b>	<b>4.6</b>	<b>0.0</b>	<b>35.7</b>	<b>0.9</b>	<b>1.8</b>	<b>15.6</b>	<b>362.8</b>	<b>924.5</b>	<b>73.5</b>			<b>2,185.5</b>
Offset Ratio	<b>2.0%</b>	<b>20.6%</b>	<b>25.8%</b>	<b>11.1%</b>	<b>27.5%</b>	<b>41.1%</b>	<b>0.0%</b>	<b>1.6%</b>	<b>0.0%</b>	<b>84.1%</b>	<b>0.2%</b>	<b>5.7%</b>	<b>27.8%</b>	<b>167.5%</b>	<b>97.1%</b>	<b>7.6%</b>	<b>NA</b>	<b>NA</b>	<b>28.1%</b>

**Table 3: Habitat value worksheet used for accounting of offsets for Cape May Warbler, Bay-breasted Warbler and Canada Warbler**

Common Name	Habitat Classification Scheme *	Coniferous			Deciduous			Riparian Forest			Wetland			Dry Sl.	Cultiv.	Non-veg.		
		7-class *	16-class *	CMF	CYF	CSH	DMF	DYF	DSH	RMF	RYF	RSH	FBS/FBT	WRI	WSH	WGR	DSG/DSS	CUL
Cape May Warbler	7-class	0.09	0.09	0.09	0.02	0.02	0.02	0.19	0.19	0.19	0.00	0.00	0.00	0.00	0.08	0.00	0.00	
Bay-breasted Warbler	16-class	0.16	0.05	0.00	0.09	0.02	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Canada Warbler	7-class	0.20	0.20	0.20	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	
<b>Warbler (3) richness</b>		3	3	2	3	3	3	2	1	1	1	1	1	1	1	1	2	
<b>Sum of Habitat Value Coefficient</b>		0.444	0.329	0.282	0.230	0.159	0.481	0.538	0.195	0.195	0.000	0.000	0.000	0.000	0.084	0.000	0.062	
<b>Standardized Habitat Value Coefficient</b>		0.148	0.110	0.094	0.077	0.053	0.160	0.179	0.065	0.065	0.000	0.000	0.000	0.000	0.028	0.000	0.021	
<b>Footprint Habitat Index</b>																		<b>Total</b>
Area in Footprint (ha)		1062	580	75	312	1634	295	238	294	627	42	401	31	56	217	952	968	7784
Footprint Habitat Value Hectares		157.3	63.6	7.0	24.0	86.4	47.3	42.6	19.1	40.7	0.0	0.0	0.0	0.0	6.1	0.0	20.1	514.3
<b>Offsets</b>																		
Wilder Ck/Rutledge Offset Areas (ha)		0.0	9.7	4.7	0.0	48.7	13.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	177.8	286.7	16.8	562.0
Marl Fen Offset Area (ha)		0.0	84.5	11.7	0.0	37.0	51.2	0.0	0.0	0.0	35.6	0.0	1.8	15.6	0.0	399.5	0.0	636.8
BCH Parcel Offset Areas (ha)		21.6	25.0	2.9	34.7	364.4	57.1	0.0	0.0	0.0	0.1	0.9	0.0	0.0	185.0	238.4	56.7	986.8
<b>Total Offset Areas (ha)</b>		<b>21.6</b>	<b>119.2</b>	<b>19.3</b>	<b>34.7</b>	<b>450.0</b>	<b>121.3</b>	<b>0.0</b>	<b>4.6</b>	<b>0.0</b>	<b>35.7</b>	<b>0.9</b>	<b>1.8</b>	<b>15.6</b>	<b>362.8</b>	<b>924.5</b>	<b>73.5</b>	<b>2185.5</b>
<b>Offset Areas Habitat Value Hectares</b>		<b>3.2</b>	<b>13.1</b>	<b>1.8</b>	<b>2.7</b>	<b>23.8</b>	<b>19.4</b>	<b>0.0</b>	<b>0.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>10.1</b>	<b>0.0</b>	<b>1.5</b>	<b>76.0</b>
<b>Offset Ratio</b>		<b>2.0%</b>	<b>20.6%</b>	<b>25.8%</b>	<b>11.1%</b>	<b>27.5%</b>	<b>41.1%</b>	<b>0.0%</b>	<b>1.6%</b>	<b>0.0%</b>	<b>84.1%</b>	<b>0.2%</b>	<b>5.7%</b>	<b>27.8%</b>	<b>167.5%</b>	<b>97.1%</b>	<b>7.6%</b>	<b>14.8%</b>
<b>* Notes:</b>																		
All songbirds and woodpeckers (plus Common Nighthawk) recorded during surveys conducted 2006-2019 are listed.																		
BC List: Y = Yellow, B = Blue, R = Red.																		
COSEWIC and SARA: SC = Special Concern, T = Threatened.																		
Survey incidence is the number of surveys that a species was detected in.																		
For songbird point counts, 2,589 surveys were conducted.																		

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**Appendix 1:  
Federal Decision Statement (FDS)  
Condition 10.  
Non-wetland Migratory Bird Habitat**

## 10. Non-wetland Migratory Bird Habitat

- 10.1. The Proponent shall mitigate the potential effects of the Designated Project on non-wetland migratory bird habitat.
- 10.2. The Proponent shall develop, in consultation with Environment Canada, a plan that addresses potential effects of the Designated Project on non-wetland migratory bird habitat.
- 10.3. The plan shall include:
  - 10.3.1. non-wetland migratory bird habitat baseline conditions for habitat that would be permanently lost, habitat that would be fragmented and habitat that would remain intact;
  - 10.3.2. migratory bird abundance, distribution and use of non-wetland habitat;
  - 10.3.3. measures to mitigate the changes in aquatic and riparian-related food resources and other habitat features associated with a change from a fluvial to a reservoir system;
  - 10.3.4. compensation measures to address the unavoidable loss of non-wetland migratory bird habitat, including habitat associated with the Canada Warbler, the Cape May Warbler and the Bay-Breasted Warbler;
  - 10.3.5. an analysis of the effects of any compensation measures identified in condition 10.3.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples; and
  - 10.3.6. an approach to monitor and evaluate the effectiveness of the mitigation or compensation measures to be implemented and to verify the accuracy of the predictions made during the environmental assessment on non-wetland migratory bird habitat, including migratory bird use of that habitat.
- 10.4. The Proponent shall submit to the Agency and Environment Canada a draft copy of the plan for review:
  - 10.4.1. for conditions 10.3.1, 10.3.2, 10.3.3 and 10.3.6, 90 days prior to initiating construction; and
  - 10.4.2. for conditions 10.3.4 and 10.3.5, 90 days prior to implementing any component of the compensation plan.

10.5. The Proponent shall submit to the Agency the final plan:

10.5.1. for conditions 10.3.1, 10.3.2, 10.3.3 and 10.3.6, a minimum of 30 days prior to initiating construction; and

10.5.2. for conditions 10.3.4 and 10.3.5, a minimum of 30 days prior to implementing any component of the compensation plan.

10.6. When submitting each component of the final plan, the Proponent shall provide to the Agency an analysis that demonstrates how it has appropriately considered the input, views or information received from Environment Canada.

10.7. The Proponent shall commence the implementation of the compensation measures specified in condition 10.3.4 no later than five years from the initiation of construction.

10.8. The Proponent shall implement each component of the plan and provide to the Agency an analysis and summary of the implementation of the applicable component of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and at the end of year 1, 2, 3, 5, 10, 15, 20 and 30 of operation.

**Appendix 2:  
Photos of Various Habitats for Non-  
wetland Migratory Birds during Site Visit  
on April 16, 2025**

**Photo 1:** Looking north at Parcel 9.5



**Photo 2:** Reclaimed drainage in Parcel 1



**Photo 3:** Parcel 2.2 mature deciduous habitat



**Photo 4:** Remnant immature forest in parcel 4



**Photo 5:** Parcel 10.3 potential warbler habitat



**Photo 6:** Remnant shrubs in Parcel 10.4



**Photo 7:** Parcel 10.2 forest at top of slope



**Photo 8:** Parcel 5.9 mature deciduous



**Photo 9:** Parcel 257 Rutledge property



**Photo 10:** From Parcel 60 looking at Parcel 56



**Photo 11:** Parcel 258 Rutledge



**Photo 12:** Wilder property overview



**Appendix 3:**  
**Bird habitat Values used for Offset**  
**Accounting for Non-Wetland Migratory**  
**Birds**

**Table 4. Bird habitat value worksheet used for accounting of offsets for non-wetland migratory birds.**

Common Name	Survey Group	BC List *	COSEWIC *	SARA *	Sample Incidence *	Include in Habitat Value Score? *	Habitat Value Estimation Source *	Habitat Classification Scheme *	7-class *			16-class *			Coniferous			Deciduous			Riparian Forest			Wetland			Dry Sl.	Cultiv.	Non-veg.
									CMF	CYF	CSH	DMF	DYF	DSH	RMF	RYF	RSH	FBS/FBT	WRI	WSH	WGR	DSG/DSS	CUL	NVE					
									Coniferous-mature forest	Coniferous-young forest	Coniferous-shrub	Deciduous-mature forest	Deciduous-young forest	Deciduous-shrub	Riparian-mixed mature forest	Riparian-mixed young forest	Riparian-mixed shrub	Fen/bog	Wetland-riparian	Wetland-shrub	Wetland-graminoid	Dry slopes	Cultivated	Non-vegetated					
Mourning Dove	Songbirds	Y	-	-	2	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00			
Common Nighthawk *	CONI	B	SC	SC	92	Yes	Density	16-class	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.31	0.00	0.19	0.00	0.07	0.08	0.08	0.08	0.15				
Black Swift	Songbirds	B	E	E	1	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Ruby-throated Hummingbird	Songbirds	B	-	-	1	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Rufous Hummingbird	Songbirds	Y	-	-	1	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00				
Calliope Hummingbird	Songbirds	Y	-	-	1	N.D. in valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Belted Kingfisher *	Songbirds	Y	-	-	25	Could not estimate	Could not estimate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Yellow-bellied Sapsucker	Woodpeckers	Y	-	-	156	Yes	Density	16-class	0.07	0.09	0.00	0.11	0.13	0.13	0.08	0.07	0.07	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00				
American Three-toed Woodpeck	Woodpeckers	Y	-	-	50	Yes	Density	16-class	0.24	0.26	0.00	0.09	0.03	0.03	0.07	0.02	0.02	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.00				
Black-backed Woodpecker	Woodpeckers	Y	-	-	2	Too few	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Downy Woodpecker	Woodpeckers	Y	-	-	27	Yes	Density	16-class	0.00	0.16	0.00	0.09	0.21	0.00	0.08	0.32	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Hairy Woodpecker	Woodpeckers	Y	-	-	72	Yes	Density	16-class	0.14	0.04	0.00	0.12	0.08	0.16	0.10	0.02	0.06	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00				
Northern Flicker	Woodpeckers	Y	-	-	56	Yes	Density	16-class	0.07	0.12	0.00	0.07	0.03	0.21	0.01	0.08	0.25	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00				
Pileated Woodpecker	Woodpeckers	Y	-	-	35	Yes	Density	16-class	0.03	0.04	0.00	0.19	0.11	0.12	0.25	0.05	0.04	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00				
Eastern Kingbird	Songbirds	Y	-	-	25	Yes	Occupancy	7-class	0.00	0.00	0.00	0.04	0.04	0.04	0.27	0.27	0.27	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00				
Olive-sided Flycatcher	Songbirds	Y	SC	SC	53	Yes	Occupancy	7-class	0.08	0.08	0.08	0.01	0.01	0.01	0.05	0.05	0.05	0.10	0.10	0.10	0.10	0.05	0.12	0.00	0.00				
Western Wood-Pewee	Songbirds	Y	-	-	284	Yes	Density	16-class	0.05	0.08	0.04	0.06	0.10	0.02	0.01	0.01	0.02	0.04	0.03	0.38	0.10	0.02	0.02	0.03					
Yellow-bellied Flycatcher	Songbirds	Y	-	-	35	Yes	Occupancy	7-class	0.06	0.06	0.06	0.28	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Alder Flycatcher	Songbirds	Y	-	-	356	Yes	Density	7-class	0.01	0.01	0.01	0.03	0.03	0.03	0.04	0.04	0.04	0.11	0.11	0.11	0.11	0.17	0.06	0.07					
Least Flycatcher	Songbirds	Y	-	-	1488	Yes	Density	16-class	0.04	0.04	0.05	0.13	0.11	0.07	0.09	0.09	0.06	0.01	0.03	0.07	0.03	0.04	0.04	0.09					
Hammond's Flycatcher	Songbirds	Y	-	-	46	Yes	Incidence	16-class	0.18	0.05	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00					
Dusky Flycatcher	Songbirds	Y	-	-	15	Yes	Occupancy	7-class	0.00	0.00	0.00	0.02	0.02	0.02	0.09	0.09	0.09	0.11	0.11	0.11	0.11	0.23	0.00	0.00					
Pacific-slope Flycatcher	Songbirds	Y	-	-	69	Yes	Occupancy	7-class	0.11	0.11	0.11	0.17	0.17	0.17	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.02	0.00	0.00					
Eastern Phoebe	Songbirds	Y	-	-	36	Yes	Occupancy	7-class	0.04	0.04	0.04	0.07	0.07	0.07	0.05	0.05	0.05	0.08	0.08	0.08	0.08	0.13	0.08	0.00					
Say's Phoebe	Songbirds	Y	-	-	3	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Northern Shrike	Songbirds	Y	-	-	2	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Blue-headed Vireo	Songbirds	Y	-	-	193	Yes	Density	7-class	0.16	0.16	0.16	0.06	0.06	0.06	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.09	0.07	0.06					
Philadelphia Vireo	Songbirds	Y	-	-	13	Yes	Occupancy	7-class	0.03	0.03	0.03	0.05	0.05	0.05	0.09	0.09	0.09	0.12	0.12	0.12	0.12	0.00	0.00	0.00					
Warbling Vireo	Songbirds	Y	-	-	1020	Yes	Density	16-class	0.06	0.10	0.10	0.09	0.08	0.06	0.07	0.06	0.03	0.10	0.03	0.09	0.01	0.03	0.04	0.04					
Red-eyed Vireo	Songbirds	Y	-	-	1585	Yes	Density	16-class	0.08	0.05	0.08	0.08	0.08	0.06	0.10	0.07	0.08	0.02	0.06	0.04	0.00	0.08	0.08	0.06					
Canada Jay	Songbirds	Y	-	-	222	Yes	Density	7-class	0.33	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Blue Jay	Songbirds	Y	-	-	64	Yes	Occupancy	7-class	0.06	0.06	0.06	0.02	0.02	0.02	0.07	0.07	0.07	0.14	0.14	0.14	0.14	0.00	0.00	0.00					
Black-billed Magpie	Songbirds	Y	-	-	108	Yes	Occupancy	7-class	0.02	0.02	0.02	0.02	0.02	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.07	0.04					
American Crow	Songbirds	Y	-	-	205	Yes	Density	7-class	0.04	0.04	0.04	0.02	0.02	0.02	0.05	0.05	0.05	0.12	0.12	0.12	0.12	0.07	0.01	0.11					
Common Raven	Songbirds	Y	-	-	334	Yes	Density	7-class	0.05	0.05	0.05	0.06	0.06	0.06	0.10	0.10	0.10	0.02	0.02	0.02	0.02	0.16	0.07	0.05					
Tree Swallow	Songbirds	Y	-	-	109	Yes	Occupancy	7-class	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.18	0.18	0.18	0.18	0.08	0.02	0.09					
Violet-green Swallow	Songbirds	Y	-	-	22	Yes	Occupancy	7-class	0.04	0.04	0.04	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.32					
Northern Rough-winged Swallow	Songbirds	Y	-	-	2	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00					
Bank Swallow	Songbirds	Y	T	T	31	Yes	Occupancy	7-class	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.19	0.00	0.30					
Barn Swallow	Songbirds	Y	SC	T	7	N.D. in valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Black-capped Chickadee	Songbirds	Y	-	-	407	Yes	Density	7-class	0.07	0.07	0.07	0.05	0.05	0.05	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.03	0.03	0.03					
Boreal Chickadee	Songbirds	Y	-	-	80	Yes	Occupancy	7-class	0.18	0.18	0.18	0.02	0.02	0.02	0.03	0.03	0.03	0.08	0.08	0.08	0.08	0.00	0.00	0.00					
Red-breasted Nuthatch	Songbirds	Y	-	-	529	Yes	Occupancy	7-class	0.15	0.15	0.15	0.05	0.05	0.05	0.06	0.06	0.06	0.04	0.04	0.04	0.04	0.01	0.00	0.02					
White-breasted Nuthatch	Songbirds	Y	-	-	13	Yes	Occupancy	7-class	0.06	0.06	0.06	0.10	0.10	0.10	0.17	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Brown Creeper	Songbirds	Y	-	-	8	Yes	Incidence	16-class	0.20	0.34	0.00	0.00	0.04	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
House Wren	Songbirds	Y	-	-	191	Yes	Density	7-class	0.04	0.04	0.04	0.15	0.15	0.15	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.23	0.02	0.00					
Winter Wren	Songbirds	B	-	-	33	Yes	Occupancy	7-class	0.29	0.29	0.29	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Marsh Wren	Songbirds	Y	-	-	22	Yes	Occupancy	7-class	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.24	0.24	0.24	0.24	0.00	0.00	0.00					
Golden-crowned Kinglet	Songbirds	Y	-	-	229	Yes	Occupancy	7-class	0.24	0.24	0.24	0.03	0.03	0.03	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.08					
Ruby-crowned Kinglet	Songbirds	Y	-	-	292	Yes	Density	16-class	0.06	0.06	0.21	0.03	0.01	0.02	0.01	0.01	0.02	0.28	0.02	0.21	0.05	0.00	0.01	0.00					

Townsend's Solitaire	Songbirds	Y	-	-	10	Yes	Incidence	16-class	0.05	0.06	0.00	0.00	0.05	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00
Swainson's Thrush	Songbirds	Y	-	-	1479	Yes	Density	16-class	0.11	0.10	0.04	0.11	0.07	0.04	0.10	0.07	0.05	0.05	0.03	0.10	0.03	0.02	0.03	0.05
Hermit Thrush	Songbirds	Y	-	-	741	Yes	Density	16-class	0.03	0.06	0.03	0.04	0.08	0.12	0.03	0.11	0.08	0.08	0.07	0.04	0.03	0.04	0.07	0.08
American Robin	Songbirds	Y	-	-	1311	Yes	Density	16-class	0.05	0.05	0.13	0.05	0.05	0.10	0.07	0.07	0.07	0.04	0.07	0.06	0.03	0.05	0.07	0.06
Varied Thrush	Songbirds	Y	-	-	55	N.D. in valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gray Catbird	Songbirds	Y	-	-	28	Yes	Occupancy	7-class	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.06	0.00
Bohemian Waxwing	Songbirds	Y	-	-	2	N.D. in valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cedar Waxwing	Songbirds	Y	-	-	296	Yes	Density	16-class	0.02	0.05	0.15	0.02	0.05	0.12	0.01	0.04	0.04	0.19	0.03	0.08	0.09	0.05	0.03	0.03
American Pipit	Songbirds	Y	-	-	3	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Evening Grosbeak	Songbirds	Y	SC	T	50	Yes	Occupancy	7-class	0.09	0.09	0.09	0.06	0.06	0.06	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.16	
Purple Finch	Songbirds	Y	-	-	161	Yes	Occupancy	7-class	0.07	0.07	0.07	0.10	0.10	0.10	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.12	0.00
Red Crossbill	Songbirds	Y	-	-	20	Yes	Occupancy	7-class	0.15	0.15	0.15	0.10	0.10	0.10	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
White-winged Crossbill	Songbirds	Y	-	-	80	Yes	Occupancy	7-class	0.23	0.23	0.23	0.05	0.05	0.05	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.00	0.00	0.00
Pine Siskin	Songbirds	Y	-	-	282	Yes	Density	7-class	0.07	0.07	0.07	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.11	0.11	0.01	0.02	0.07	
Chipping Sparrow	Songbirds	Y	-	-	815	Yes	Density	16-class	0.04	0.07	0.12	0.05	0.03	0.03	0.04	0.05	0.06	0.16	0.13	0.03	0.06	0.02	0.04	0.07
Clay-colored Sparrow	Songbirds	Y	-	-	613	Yes	Density	7-class	0.01	0.01	0.01	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.25	0.13	0.15	
Vesper Sparrow	Songbirds	Y	-	-	156	Yes	Occupancy	7-class	0.01	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.46	0.37	0.05
Savannah Sparrow	Songbirds	Y	-	-	152	Yes	Density	7-class	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.87	0.02
LeConte's Sparrow	Songbirds	Y	-	-	9	Yes	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Sparrow	Songbirds	Y	-	-	104	Yes	Occupancy	7-class	0.03	0.03	0.03	0.02	0.02	0.02	0.11	0.11	0.11	0.05	0.05	0.05	0.05	0.09	0.04	0.22
Song Sparrow	Songbirds	Y	-	-	326	Yes	Density	7-class	0.02	0.02	0.02	0.02	0.02	0.02	0.07	0.07	0.07	0.13	0.13	0.13	0.13	0.01	0.01	0.16
Lincoln's Sparrow	Songbirds	Y	-	-	889	Yes	Density	16-class	0.01	0.02	0.12	0.02	0.03	0.08	0.02	0.04	0.12	0.10	0.15	0.06	0.10	0.02	0.05	0.07
Swamp Sparrow	Songbirds	Y	-	-	101	Yes	Density	7-class	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.25	0.00	0.00	0.00	
White-throated Sparrow	Songbirds	Y	-	-	2474	Yes	Density	16-class	0.06	0.06	0.12	0.07	0.08	0.11	0.08	0.06	0.04	0.04	0.03	0.04	0.04	0.07	0.05	0.05
White-crowned Sparrow	Songbirds	Y	-	-	25	Yes	Incidence	16-class	0.00	0.02	0.00	0.07	0.11	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.12	0.46	0.00
Dark-eyed Junco	Songbirds	Y	-	-	617	Yes	Density	7-class	0.10	0.10	0.10	0.04	0.04	0.04	0.05	0.05	0.05	0.08	0.08	0.08	0.08	0.04	0.06	0.02
Western Meadowlark	Songbirds	Y	-	-	2	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baltimore Oriole	Songbirds	B	-	-	122	Yes	Occupancy	7-class	0.01	0.01	0.01	0.17	0.17	0.17	0.08	0.08	0.08	0.04	0.04	0.04	0.04	0.00	0.06	0.00
Red-winged Blackbird	Songbirds	Y	-	-	330	Yes	Density	7-class	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.24	0.24	0.24	0.24	0.00	0.00	0.00
Brown-headed Cowbird	Songbirds	Y	-	-	594	Yes	Density	16-class	0.03	0.05	0.05	0.07	0.06	0.11	0.04	0.07	0.04	0.13	0.05	0.14	0.07	0.03	0.02	0.04
Rusty Blackbird	Songbirds	B	SC	SC	15	Yes	Incidence	16-class	0.00	0.00	0.00	0.00	0.03	0.33	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00
Brewer's Blackbird	Songbirds	Y	-	-	48	Yes	Occupancy	7-class	0.00	0.00	0.00	0.13	0.13	0.13	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.05	0.33	0.00
Common Grackle	Songbirds	Y	-	-	4	Too few	Incidence	16-class	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ovenbird	Songbirds	Y	-	-	1344	Yes	Density	16-class	0.09	0.11	0.09	0.18	0.15	0.07	0.08	0.05	0.03	0.01	0.02	0.00	0.01	0.03	0.05	0.02
Northern Waterthrush	Songbirds	Y	-	-	269	Yes	Occupancy	7-class	0.04	0.04	0.04	0.04	0.04	0.04	0.07	0.07	0.07	0.09	0.09	0.09	0.09	0.05	0.00	0.17
Black-and-white Warbler	Songbirds	Y	-	-	377	Yes	Density	7-class	0.06	0.06	0.06	0.07	0.07	0.07	0.11	0.11	0.11	0.06	0.06	0.06	0.06	0.01	0.01	0.04
Tennessee Warbler	Songbirds	Y	-	-	809	Yes	Occupancy	7-class	0.10	0.10	0.10	0.06	0.06	0.06	0.08	0.08	0.08	0.06	0.06	0.06	0.06	0.01	0.01	0.02
Orange-crowned Warbler	Songbirds	Y	-	-	583	Yes	Density	7-class	0.05	0.05	0.05	0.13	0.13	0.13	0.04	0.04	0.04	0.02	0.02	0.02	0.02	0.12	0.06	0.05
Nashville Warbler	Songbirds	Y	-	-	1	N.D. in valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Connecticut Warbler	Songbirds	B	-	-	44	Yes	Occupancy	7-class	0.03	0.03	0.03	0.05	0.05	0.05	0.00	0.00	0.19	0.19	0.19	0.19	0.00	0.00	0.00	0.00
MacGillivray's Warbler	Songbirds	Y	-	-	30	Yes	Occupancy	7-class	0.33	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mourning Warbler	Songbirds	Y	-	-	174	Yes	Occupancy	7-class	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.03	0.03	0.03	0.03	0.11	0.04	0.09
Common Yellowthroat	Songbirds	Y	-	-	374	Yes	Occupancy	7-class	0.01	0.01	0.01	0.03	0.03	0.03	0.05	0.05	0.05	0.16	0.16	0.16	0.16	0.01	0.02	0.05
American Redstart	Songbirds	Y	-	-	764	Yes	Density	16-class	0.10	0.02	0.12	0.09	0.05	0.06	0.18	0.12	0.05	0.06	0.02	0.04	0.02	0.03	0.03	0.02
Cape May Warbler	Songbirds	B	-	-	18	Yes	Occupancy	7-class	0.09	0.09	0.09	0.02	0.02	0.02	0.19	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnolia Warbler	Songbirds	Y	-	-	247	Yes	Occupancy	7-class	0.12	0.12	0.12	0.04	0.04	0.04	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.00	0.00	0.03
Bay-breasted Warbler	Songbirds	R	-	-	10	Yes	Incidence	16-class	0.16	0.05	0.00	0.09	0.02	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow Warbler	Songbirds	Y	-	-	1800	Yes	Density	16-class	0.06	0.04	0.04	0.09	0.08	0.10	0.07	0.07	0.06	0.04	0.06	0.07	0.04	0.07	0.05	0.06
Blackpoll Warbler	Songbirds	Y	-	-	36	Yes	Occupancy	7-class	0.06	0.06	0.06	0.04	0.04	0.04	0.24	0.24	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yellow-rumped Warbler	Songbirds	Y	-	-	1558	Yes	Density	16-class	0.12	0.16	0.05	0.10	0.06	0.03	0.09	0.04	0.03	0.05	0.06	0.06	0.04	0.01	0.03	0.07
Townsend's Warbler	Songbirds	Y	-	-	47	Yes	Incidence	16-class	0.12	0.14	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00
Black-throated Green Warbler	Songbirds	B	-	-	418	Yes	Occupancy	7-class	0.20	0.20	0.20	0.06	0.06	0.06	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Canada Warbler	Songbirds	B	SC	T	209	Yes	Density	7-class	0.20	0.20	0.20	0.12	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Wilson's Warbler	Songbirds	Y	-	-	117	Yes	Occupancy	7-class	0.11	0.11	0.11	0.07	0.07	0.07	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.06	0.12	0.00
Western Tanager	Songbirds	Y	-	-	918	Yes	Density	16-class	0.17	0.14	0.02	0.09	0.07	0.04	0.09	0.05	0.03	0.09	0.03	0.05	0.03	0.01	0.03	0.04

Rose-breasted Grosbeak	Songbirds	Y	-	-	752	Yes	Density	7-class	0.06	0.06	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.05	0.05	0.05	0.05	0.05	0.02	0.09	
<b>Total richness</b>									82	83	71	79	92	82	78	76	77	73	80	78	75	75	73	71	
<b>Total richness of included species ("Yes" in column J)</b>									61	62	51	60	65	62	59	57	58	54	61	59	54	54	54	52	
<b>Number of listed species</b>									8	8	7	8	9	10	7	6	7	7	7	6	7	7	7	8	
<b>Habitat Value Coefficient</b>									6.852	7.027	5.942	5.337	12.351	7.263	5.781	4.903	5.072	5.610	5.360	5.580	6.315	7.103	4.859	3.643	
<b>Standardized Habitat Value Coefficient</b>									<b>0.069</b>	<b>0.071</b>	<b>0.060</b>	<b>0.054</b>	<b>0.125</b>	<b>0.073</b>	<b>0.058</b>	<b>0.050</b>	<b>0.051</b>	<b>0.057</b>	<b>0.054</b>	<b>0.056</b>	<b>0.064</b>	<b>0.072</b>	<b>0.049</b>	<b>0.037</b>	
<b>Listed Species Habitat Value Coefficient</b>									1.162	1.046	0.999	0.640	2.603	1.339	0.869	0.526	0.832	1.063	0.623	0.432	0.506	0.409	0.279	0.671	
<b>Standardized Listed Species Habitat Value Coefficient</b>									<b>0.083</b>	<b>0.075</b>	<b>0.071</b>	<b>0.046</b>	<b>0.186</b>	<b>0.096</b>	<b>0.062</b>	<b>0.038</b>	<b>0.059</b>	<b>0.076</b>	<b>0.045</b>	<b>0.031</b>	<b>0.036</b>	<b>0.029</b>	<b>0.020</b>	<b>0.048</b>	
<b>Combined Habitat Value (50:50 weight of all species together and listed species only)</b>									<b>0.076</b>	<b>0.073</b>	<b>0.066</b>	<b>0.050</b>	<b>0.155</b>	<b>0.084</b>	<b>0.060</b>	<b>0.044</b>	<b>0.055</b>	<b>0.066</b>	<b>0.049</b>	<b>0.044</b>	<b>0.050</b>	<b>0.050</b>	<b>0.034</b>	<b>0.042</b>	
<b>Combined Habitat Index</b>																									
<b>Area in Footprint (ha)</b>									1062	580	75	312	1634	295	238	294	627	42	401	31	56	217	952	968	7784
<b>Footprint Habitat Value Hectares</b>									<b>80.8</b>	<b>41.1</b>	<b>4.5</b>	<b>16.8</b>	<b>203.8</b>	<b>21.6</b>	<b>13.9</b>	<b>14.6</b>	<b>32.1</b>	<b>2.4</b>	<b>21.7</b>	<b>1.7</b>	<b>3.6</b>	<b>15.5</b>	<b>46.7</b>	<b>35.6</b>	<b>556.7</b>
Wilder Ck/Rutledge Offset Areas (ha)									0	9.73	4.66	0	48.66	13	0	4.63	0	0	0	0	0	177.79	286.7	16.8	562.0
Marl Fen Offset Area (ha)									0	84.5	11.7	0.0	37.0	51.2	0.0	0.0	0.0	35.6	0.0	1.8	15.6	0.0	399.5	0	636.8
BCH Parcel Offset Areas (ha)									21.6	25.0	2.9	34.7	364.4	57.1	0.0	0.0	0.0	0.1	0.9	0.0	0.0	185.0	238.4	56.7	986.8
<b>Total Offset Areas (ha)</b>									<b>21.6</b>	<b>119.2</b>	<b>19.3</b>	<b>34.7</b>	<b>450.0</b>	<b>121.3</b>	<b>0.0</b>	<b>4.6</b>	<b>0.0</b>	<b>35.7</b>	<b>0.9</b>	<b>1.8</b>	<b>15.6</b>	<b>362.8</b>	<b>924.5</b>	<b>73.5</b>	<b>2185.5</b>
<b>Offset Areas Habitat Value Hectares</b>									<b>1.6</b>	<b>8.7</b>	<b>1.3</b>	<b>1.7</b>	<b>69.9</b>	<b>10.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>2.4</b>	<b>0.0</b>	<b>0.1</b>	<b>0.8</b>	<b>18.3</b>	<b>31.9</b>	<b>3.1</b>	<b>150.3</b>
<b>Offset Ratio</b>									<b>2.0%</b>	<b>21.1%</b>	<b>28.2%</b>	<b>10.3%</b>	<b>34.3%</b>	<b>47.3%</b>	<b>0.0%</b>	<b>1.4%</b>	<b>0.0%</b>	<b>98.4%</b>	<b>0.2%</b>	<b>4.4%</b>	<b>21.8%</b>	<b>117.8%</b>	<b>68.2%</b>	<b>8.7%</b>	<b>27.0%</b>

**\* Notes:**  
 All songbirds and woodpeckers (plus Common Nighthawk) recorded during surveys conducted 2006-2019 are listed.  
 BC List: Y = Yellow, B = Blue, R = Red. COSEWIC and SARA: SC = Special Concern, T = Threatened.  
 Survey incidence is the number of surveys that a species was detected in. For songbird point counts, 2,589 surveys were conducted.