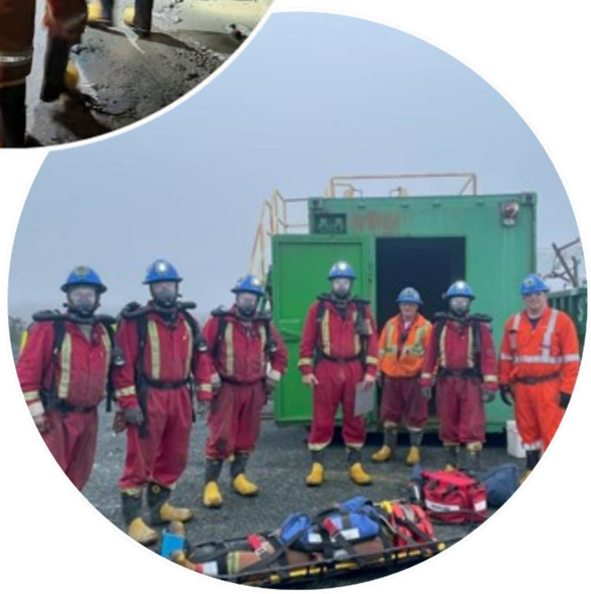
Green Bay Ming Mine Project Environmental Registration

Appendices Part 2

April 2025



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Legal Statements

FireFly Metals Ltd (**Company**), the ultimate parent company of FireFly, is a publicly listed company, listed on the ASX and TSX and makes the following statements as a matter of legal compliance.

1. Conceptual Design

The statements that appear throughout this document regarding future production, life of mine, capital expenditure, revenues, and similar matters are at this time early stage. Such statements are based on a conceptual design and are not production targets or forecast financial information for the purposes of applicable law and stock exchange regulation, including the ASX Listing Rules and applicable Australian law and the rules of the TSX and applicable Canadian law. Further work and studies are required before the Company will be in a position to issue such production targets or forecast financial information.

The information presented in this document represents the current conceptual design. As the detailed design of the Green Bay Ming Mine Project progresses, refinements will likely occur to address the results of further studies and input received from regulators, the public and stakeholders through the environmental assessment and permitting processes.

The Company cautions investors who may access this document against making investment decisions based on any aspirational statements included in this document.

No Competent Person, for the purposes of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, or Qualified Person, for the purposes of Canadian National Instrument 43-101 - Standards of Disclosure for Mineral Projects, has approved the information included in this document.

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This document contains certain forward-looking statements and projections, including statements regarding the Company's plans, forecasts and projections with respect to FireFly's mineral properties and programs. Forward-looking statements may be identified by the use of words such as "may", "might", "could", "would", "will", "expect", "intend", "believe", "forecast", "milestone", "objective", "predict", "plan", "scheduled", "estimate", "anticipate", "continue", or other similar words and may include, without limitation, statements regarding plans, strategies and objectives.

Although the forward-looking statements contained in this document reflect management's current beliefs based upon information currently available to management and based upon what management believes to be reasonable assumptions (subject to the "Aspirational Statements" disclosure above), such forward-looking statements and projections are estimates for initial consideration only and should not be relied upon. They are not guarantees of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of the Company and FireFly, which may include changes in commodity prices, foreign exchange fluctuations, economic, social and political conditions, and changes to applicable regulations.

The performance of the Company may be influenced by factors which are uncertain or outside the control of the Company, and their respective directors, officers, employees and contractors. The Company and FireFly do not make any representations and provide no warranties concerning the accuracy of any forward-looking statements or projections and disclaim any obligation to update or revise any forward-looking statements or projections based on new information, future events or otherwise, except to the extent required by applicable laws.

List of Appendices

Appendix 6.A Desktop Hydrological Assessment

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6.A.1 Methods

6.A.1.1 Homogeneity Tests

Regional streamflow monitoring stations operated by the Water Survey of Canada (WSC) were assessed to characterize the regional hydrology. This assessment examines hydrology data at a regional scale, allowing for many years of flow data from WSC hydrometric stations to be analyzed allowing extreme and mean (high, low and mean) flow events to be captured. This provides greater confidence in flow statistics that are generated to represent the hydrologic conditions of the Local Assessment Area (LAA) watersheds. The site hydrology data collected at the LAA watersheds can then be used to assess suitability with the regional hydrology relationships.

WSC stations were selected based on criteria like gross drainage area, period of record, distance to the Project Area, and regulation type (Table 6.A.1). The stations selected were within 150 kilometres (km) from the Project Area, had a record length of at least 20 years, and were unregulated. Additionally, the stations were selected such that they had a range of watershed areas that were within one order of magnitude of the Project Area's range of sub-watersheds (20 square kilometres [km^2] to 780 km^2).

A series of homogeneity tests were completed for the selected WSC stations to refine the datasets to be representative of the local hydrological conditions. The tests conducted on the initially selected WSC stations are described below:

- **Unit Flow**: Unit flows were calculated for each WSC station by dividing the mean annual flow by the associated catchment area to provide a unit of flow per square kilometre of catchment area. The standard deviation of the average annual unit flows was used to provide a preferred range of unit flows for the homogeneity assessment.
- **Flow Duration Curve (FDC)**: A flow duration curve is an analytical tool used to study the variability of stream flows. The flow duration curve presents the ratio of the daily flow divided by the mean annual flow versus the exceedance probability of that ratio. The years that had more than 20 days of missing data were omitted from the calculations. The probability of exceedance (P) was determined by ranking the daily flows in descending order and using the formula below:

$$\boldsymbol{P = 100 \times \left(\frac{M}{n+1}\right)}$$

Where: *P* = the probability that a given flow will be equaled or exceeded (% of time);
M = the ranked position on the listing (dimensionless);
n = the number of events for period of record (dimensionless)

- **Index Flood Flow**: The index flood flow is a technique used in flood studies to assess the homogeneity of WSC stations based on the return interval of the regionally based 10-year flood flow and the station period of record. The method follows the techniques used by Dalrymple (1960) and Harvey et. al (1985) with the homogeneity test using an Extreme Value Type 1 distribution by Gumbel (1958). The regionally based 10-year flood flow is calculated by dividing each station's 10-year flood flow by the index flood flow (2.33-year return period flood flow or the mean annual flood flow), which is averaged over the data set. The mean annual flood flow is multiplied by the averaged unitless 10-year flood flow divided by the mean annual flood flow to yield the regionally based 10-year flood flow. A flood frequency curve is plotted for the regionally based 10-year flood flow to develop a relationship between the flood flow and return period for each station. A station-based return period is then calculated for each station to plot against the station period of record and compared to the upper and lower limit curves.

Table 6.A.1 Summary of Water Survey of Canada Stations Selected for Homogeneity Test

Station Name	Station Number	Distance to Site (km)	Drainage Area (km²)	Period of Record	Record Length (years)	Regulation Type
Northeast Brook near Roddickton	02YD002	100	200	1980-2024	45	Natural
Southwest Brook near Baie Verte	02YM003	13	93.2	1980-2024	45	Natural
Indian Brook Diversion Above Birchy Lake	02YM004	75	238	1989-2024	36	Natural
Sheffield Brook Near Trans Canada Highway	02YK005	82	391	1972-2024	53	Natural
Peters River near Botwood	02YO006	110	177	1981-2024	44	Natural
Southwest Brook at Lewisport	02YO012	112	58.7	1989-2024	36	Natural
Salmon River near Glenwood	02YQ005	135	80.8	1987-2024	37	Natural
Torrent River at Bristol's Pool	02YC001	105	624	1959-2024	66	Natural
Main River at Paradise Pool	02YG001	80	627	1986-2024	39	Natural
Upper Humber River Above Black Brook	02YL008	96	471	1988-2024	37	Natural
Boot Brook at Trans-Canada Highway	02YK008	108	20.4	1985-2024	40	Natural
Great Rattling Brook above Tote River Confluence	02YO008	133	773	1984-2024	41	Natural

6.A.1.2 Regional Hydrology Assessment

This section describes how the parameters for the regional assessment were calculated for the Project Area using stations selected based on the above homogeneity tests.

- **Mean Annual and Monthly Flows:** using daily flow data, annual mean relationships and monthly mean flow relationships are generated using regression. These relationships are then applied to watersheds in the LAA. The mean annual flow (MAF) is calculated by determining the mean flow for each year, then averaging the values for the full record of the dataset. Mean monthly flows are calculated similar to the MAF, but performed for each month rather than each year, and then by averaging the values for the full record of the station dataset.
- **Peak Flows:** Peak flows are calculated using the instantaneous flows from the regional WSC stations. The instantaneous peak flow for each year is input into HYFRAN software (El Adlouni and Bobée 2015) to calculate the peak flow for various return periods (2-, 5-, 10-, 25-, 50-, and 100-year). A Log-Pearson Type III distribution with Method of Moments is used to calculate the peak flows. Peak flow and environmental low flow estimates are typically used as the design flows for project infrastructure.
- **Environmental flows (maintenance flows, instream flow needs):** Environmental flows describe the quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems. Through implementation of environmental flows, a flow regime that maintains the essential processes to support healthy river ecosystems can be achieved (NLDMAE 2017). The environmental flows for summer and winter are 50% and 30% of the MAFs, respectively. Single low flow indices (e.g., $7Q_{10}$, $7Q_{20}$) are derived using a regional frequency analysis for the selected WSC stations.

6.A.1.3 Local Hydrology Assessment

6.A.1.3.1 Environmental Water Balance

To support understanding of the baseline hydrologic system in the Project Area, an accounting procedure is applied to assess the amounts of water transferring to various elements of the hydrologic system (e.g., evapotranspiration, infiltration, streamflow), which is referred to as an environmental water balance. The environmental water balance was developed based on available data for climate normal, wet year, and dry year conditions and can be represented by the following relationship:

$$\boldsymbol{P = ET + R + I \pm \Delta S}$$

Where: P = Precipitation;
ET = Evapotranspiration;
R = Overland Flow or Surface Runoff;
I = Infiltration (Surplus); and
ΔS = Change in Storage

Surplus runoff was calculated in the water balance model based on climate and physiographic characteristics (e.g., soils). The Thornthwaite monthly water balance model, refined by the United States Geological Survey (USGS) (Thornthwaite and Mather 1957; Wolock and McCabe 1999) was used to estimate surface water runoff based on net precipitation less the evapotranspiration and infiltration losses. Input parameters were established based on latitude of the site, local climate (precipitation and temperature), land cover, soil conditions and guidance provided by the USGS manual (2007). A summary of the input parameters for the model are included in Section 6.A.2.3.2.

The potential evapotranspiration (PET) in the model is calculated using the Hamon equation (Hamon 1961):

$$\boldsymbol{PET_{Hamon} = 13.97 \times d \times D^2 \times W_t}$$

Where: d = number of days in a month;
D = mean monthly hours of daylight in units of 12 hours; and
W = saturated water vapor density term, in grams per cubic metre.

$$\boldsymbol{W_t = \frac{4.95 \times e^{0.062 \times T}}{100}}$$

Where: *T* = mean monthly temperature in degree Celsius (Hamon 1961)

Actual evapotranspiration (AET) is derived from PET and soil-moisture. When precipitation for a month is less than PET, the AET is equal to precipitation plus the amount of moisture that can be withdrawn from storage in the soil. If precipitation for a month is greater than PET, then AET equals PET.

Water surplus is defined using the infiltration factor as defined by the Ontario Minister of Environment Conservation and Parks, formerly the Ministry of the Environment (2003). The infiltration factor is determined from average topographic slope, hydrologic soil type, and vegetation cover type. Infiltrated water recharges aquifers and routes via interflow to streams and lakes. Net infiltrated water recharges aquifers and discharges as baseflow locally or regionally. For this study, ground watersheds are assumed to align with surface watersheds and all baseflow returns to a local watershed where infiltration occurred.

Additionally, for the purpose of the water balance calculations, it is assumed that runoff, evapotranspiration, and infiltration are negligible in months with average monthly temperatures below 0°C.

6.A.1.3.2 Watershed Statistics

Watershed areas were delineated using the methodology described in Section 6.3.1.1 of the Environmental Registration. Baseline flow statistics for the watershed areas were generated using the equations developed in the regional analyses shown in Sections 6.A.2.3 and 6.A.2.3.1.

6.A.2 Results

6.A.2.1 Homogeneity Testing

The results of the homogeneity testing and selected WSC stations are presented below.

- **Unit Flow**: The average unit flow was calculated to be 33.3 litres per second per square kilometre (L/s/km²), with an associated standard deviation of 9.9 L/s/km². The preferred unit flows were found to range between a minimum of 23.3 L/s/km² and a maximum of 43.2 L/s/km². Two WSC Stations were found to be outside this range (02YL008 [Upper Humber River above Black Pool] and 02YG001 [Main River at Paradise Pool]), as summarized in Table 6.A.1.

- **Flow Duration Curve (FDC)**: The FDC is used to study the variability of stream flows. The shape of the FDC reflects the composite effect of the physiographic (including geologic) and climatic influences on stream flow and hence watershed response. The slope of the FDC at each extreme end shows the high flow (upper end) and low flow (lower end) variability. Figure 6.A.1 shows the FDC for the WSC stations. WSC Stations 02YM004, 02YK005, and 02YM003 show higher variability throughout the graph and Station 02YK008 had variability after the 80th percentile mark. These variations imply that these stations have varying hydrological response behaviour to the others.

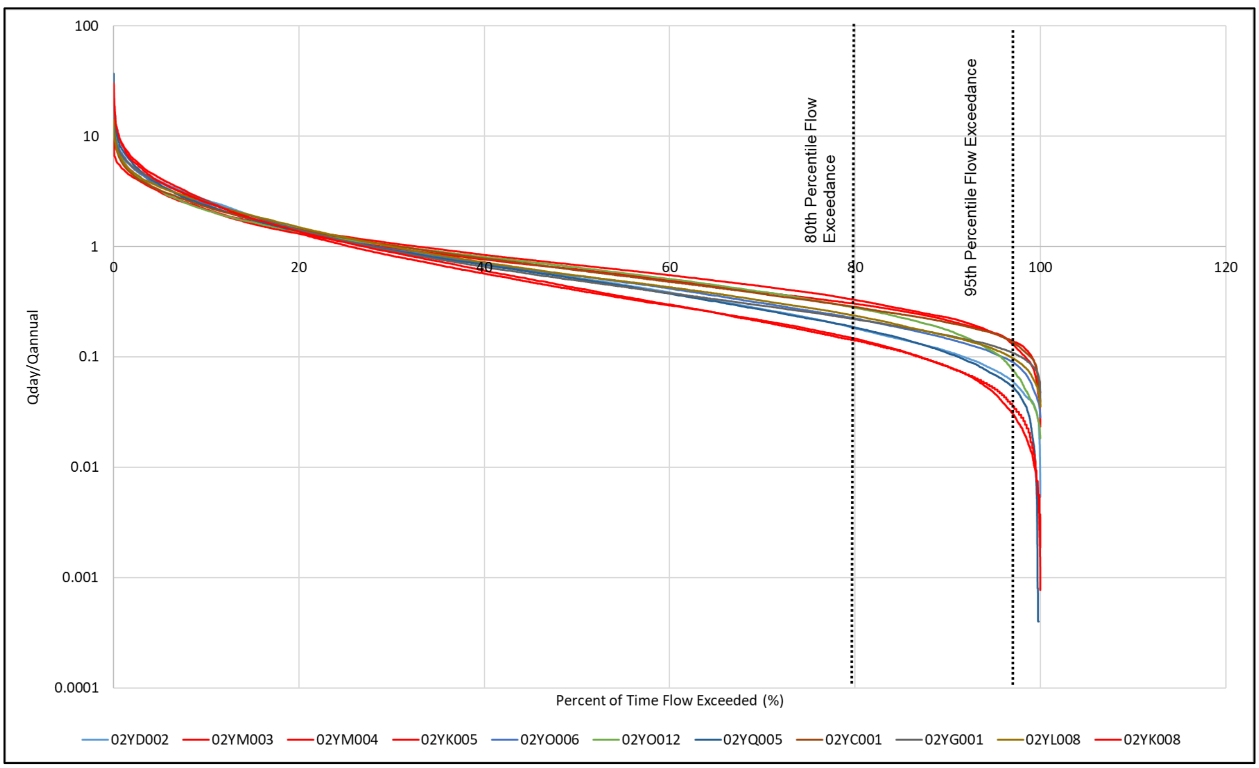

Figure 6.A.1 Flow Duration Curve for WSC Stations

Index Flood Flow:

- Figure 6.A.2 depicts the homogeneity test for index flow with 95% confidence interval. The flood index homogeneity test for the WSC stations shows that Stations 02YL008, 02YK005, and 02YC001 are at or slightly outside of the Log-Normal Type III 95% confidence interval.

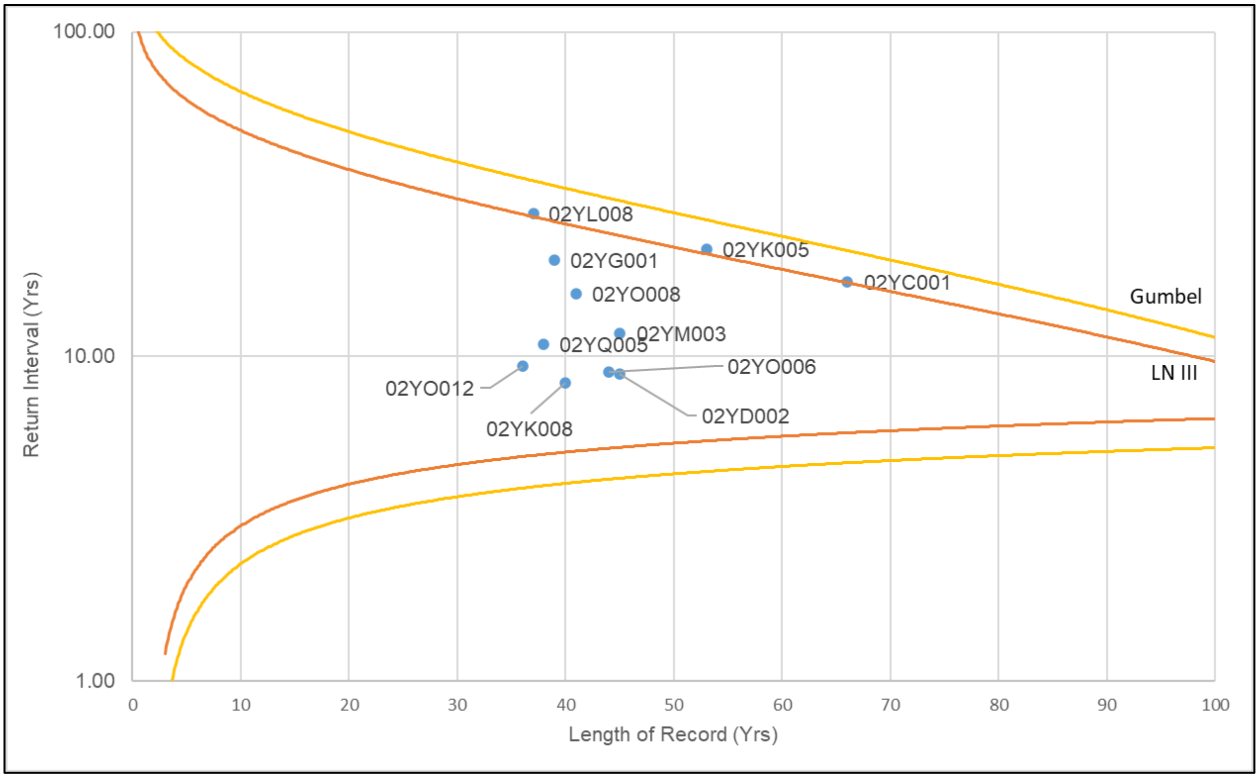

Figure 6.A.2 Homogeneity Test – Index Flood Approach with 95% Confidence Interval

Selection of the WSC stations to continue with the regional hydrology assessment (Table 6.A.2) was based on initial criteria (catchment area, distance to site, flow regime, length of record period) and was tested to determine the homogeneity of the data set. Stations 02YM004 (Indian Brook Diversion Above Birchy Lake), 02YK005 (Sheffield Brook Near Trans Canada Highway), 02YL008 (Upper Humber River Above Black Brook), 02YC001 (Torrent River at Bristol's Pool), and 02YG001 (Main River At Paradise Pool) were removed from the regional dataset. Station 02YM004 had a unit flow value out of the accepted range and showed high variability on the FDC curve. Station 02YK005 also had a unit flow value out of the accepted range, showed high variability on the FDC curve, and had one of the lowest homogeneities of flood flow relative to the regional dataset on the Index flood curve. Station 02YL008 has a unit flow out of the accepted range and had one of the lowest homogeneities of flood flow relative to the regional dataset on the Index flood curve. Stations 02YC001 and 02YG001 were removed as they had a runoff coefficient that was substantially different compared to the other stations selected.

Table 6.A.2 Water Survey of Canada Station Summary

Station Name	Station Number	Distance to Site (km)	Drainage Area (km²)	Period of Record	Record Length (years)	Regulation Type	FDC Curve	Index Flood Curve	Unit Flow (L/s/km²)
Northeast Brook near Roddickton	02YD002	100	200	1980-2024	45	Natural	Pass	Pass	27.9
Southwest Brook near Baie Verte	02YM003	13	93.2	1980-2024	45	Natural	Fail	Pass	27.9
Peters River near Botwood	02YO006	110	177	1981-2024	44	Natural	Pass	Pass	25.1
Southwest Brook at Lewisport	02YO012	112	58.7	1989-2024	36	Natural	Pass	Pass	26.0
Salmon River near Glenwood	02YQ005	135	80.8	1987-2024	37	Natural	Pass	Pass	30.9
Boot Brook at Trans-Canada Highway	02YK008	108	20.4	1985-2024	40	Natural	Fail	Pass	26.2
Great Rattling Brook above Tote River Confluence	02YO008	133	773	1984-2024	41	Natural	Pass	Pass	28.9

6.A.2.2 Regional Hydrology Assessment

Seven WSC stations were selected following the homogeneity tests to conduct the regional hydrology assessment (Table 6.A.2). The regional hydrology assessment is used to calculate a relationship between flow and catchment area to be used to estimate local and hydrological conditions near the Project Area. Hydrologic relationships were calculated for the mean annual flow, mean monthly flows, peak flows, and low flows as presented in Section 6.A.2.2.1 to 6.A.2.2.4, respectively.

6.A.2.2.1 Mean Annual Flow

The mean annual flow for the seven selected regional WSC stations range were plotted versus their associated catchment areas in Figure 6.A.3. The trendline of the plotted stations was used to provide a relationship that can be applied to the local hydrological station catchment areas to estimate mean annual flow. The coefficient of determination (R^2) of the relationship between flow and catchment area is 0.999, which indicates a high level of correlation. The summary of MAF and runoff coefficients for the WSC stations are shown in Table 6.A.3.

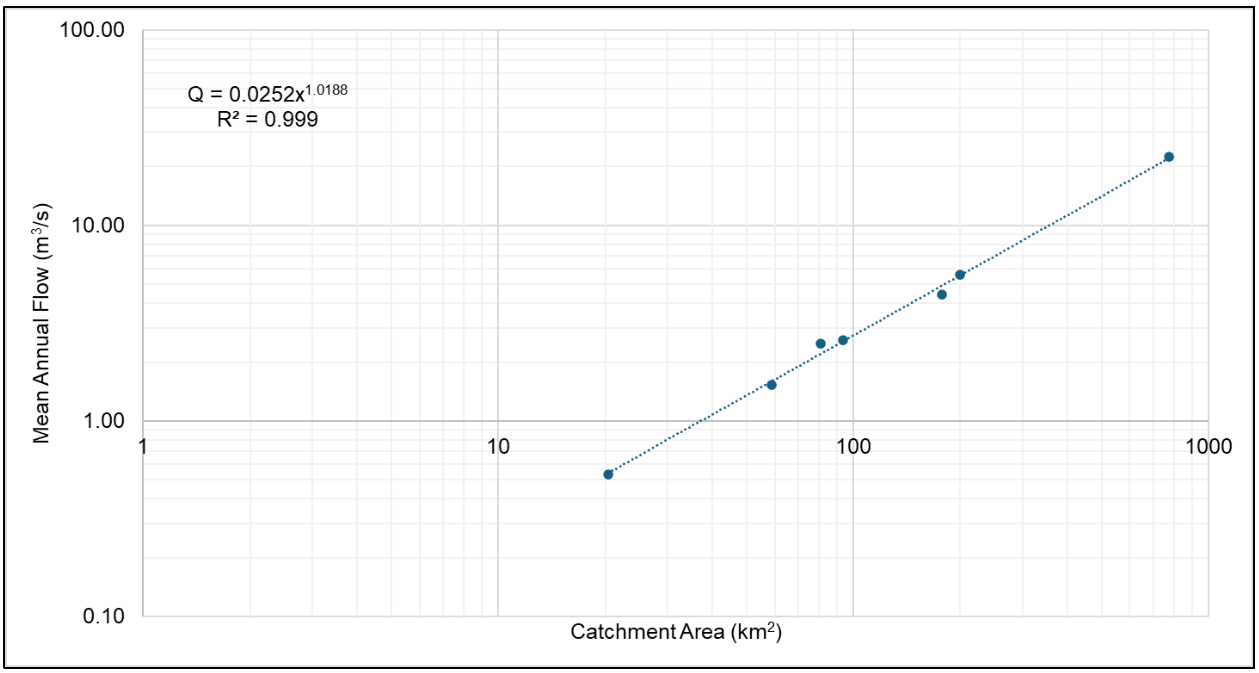

Figure 6.A.3 Regional Station Relationship Between Mean Annual Flows and Catchment Area

Table 6.A.3 Mean Annual Flow and Runoff Coefficient Summary

Station Name	Station ID	Drainage Area (km^2)	Mean Annual Flow (m^3/s)	Unit Flow ($m^3/s/km^2$)	Runoff Coefficient
Northeast Brook Near Roddickton	02YD002	200	5.58	0.028	0.72
South West Brook Near Baie Verte	02YM003	93.2	2.60	0.028	0.72
Peters River Near Botwood	02YO006	177	4.45	0.025	0.70
Southwest Brook At Lewisporte	02YO012	58.7	1.53	0.026	0.66
Salmon River Near Glenwood	02YQ005	80.8	2.50	0.031	0.78
Boot Brook At Trans-Canada Highway	02YK008	20.4	0.53	0.026	0.72
Great Rattling Brook Above Tote River Confluence	02YO008	773	22.36	0.029	0.83

6.A.2.2.2 Mean Monthly Flows

Similar to the mean annual flow, the mean monthly flows for the nine selected WSC stations range were plotted versus their associated catchment areas on a log-log graph (Figures 6.A.4 and 6.A.5). The R^2 of the relationship between the mean monthly flows and catchment areas ranges between 0.81 to 1.00, which indicates a good level of correlation. The variance in the R^2 values may be indicative of locational difference for spring melt. Table 6.A.4 summaries the relationship between the mean monthly flows and catchment areas.

Table 6.A.4 Regional Station Relationship Between Mean Monthly Flows and Catchment Area

Month	Mean Monthly Flow Regression Equation	R^2
January	$Q = 0.0201x^{0.9658}$	0.98
February	$Q = 0.0105x^{1.0632}$	0.97
March	$Q = 0.0127x^{1.0913}$	0.98
April	$Q = 0.0705x^{0.9853}$	0.98
May	$Q = 0.0599x^{0.9906}$	0.87
June	$Q = 0.0162x^{1.0717}$	0.81
July	$Q = 0.0126x^{0.9845}$	0.99
August	$Q = 0.0109x^{0.9994}$	1.00
September	$Q = 0.0277x^{0.9622}$	0.99
October	$Q = 0.0284x^{0.9784}$	1.00
November	$Q = 0.0289x^{1.019}$	1.00
December	$Q = 0.0193x^{1.0524}$	1.00

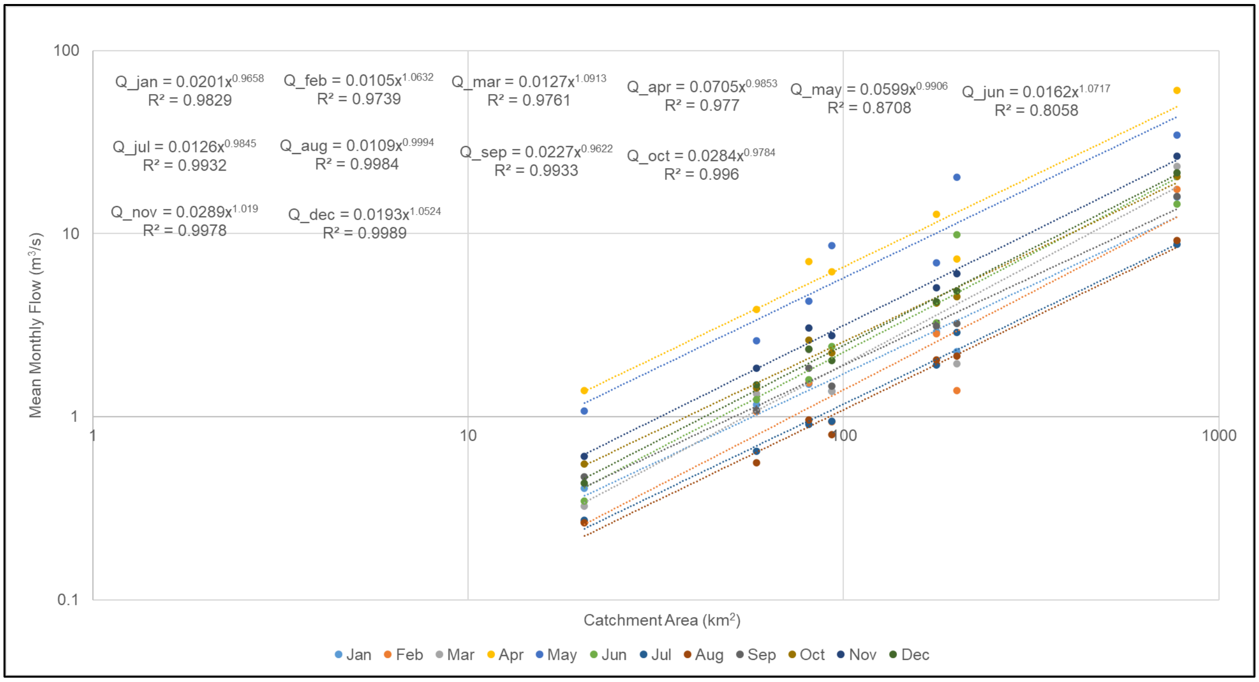

Figure 6.A.4 Graph of Mean Monthly Flow at WSC Stations

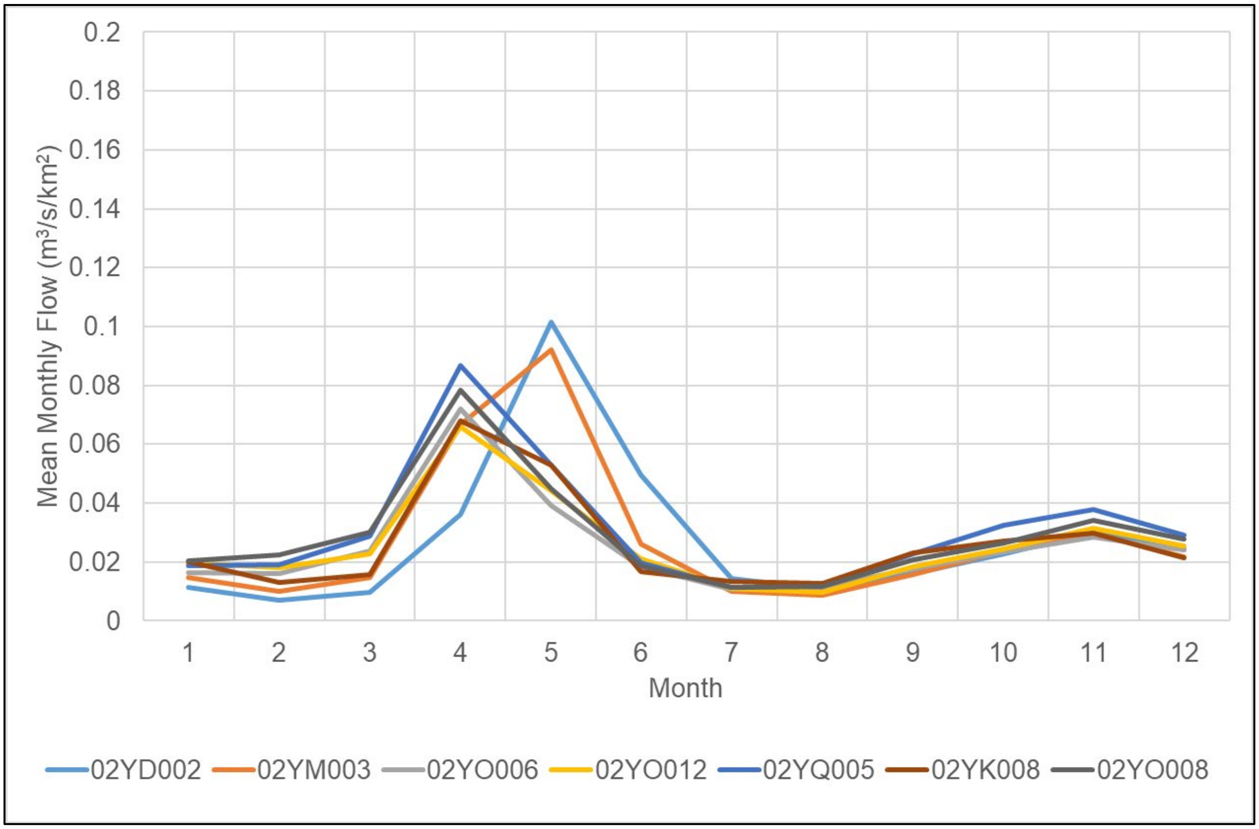

Figure 6.A.5 Graph of Mean Monthly Flow per Month at WSC Stations

6.A.2.2.3 Peak Flow

Instantaneous flows were used from the nine WSC stations to calculate the peak flow for various return periods (2-, 5-, 10-, 25-, 50-, and 100-year) as shown on Figure 6.A.6. The R^2 of the relationship between the peak flows and catchment areas ranges between 0.95 and 0.97, which indicates a good level of correlation for the identified return periods. The peak flow and catchment area for the desired return periods were plotted on a graph to determine the relationship for the various return periods as shown in Figure 6.A.6.

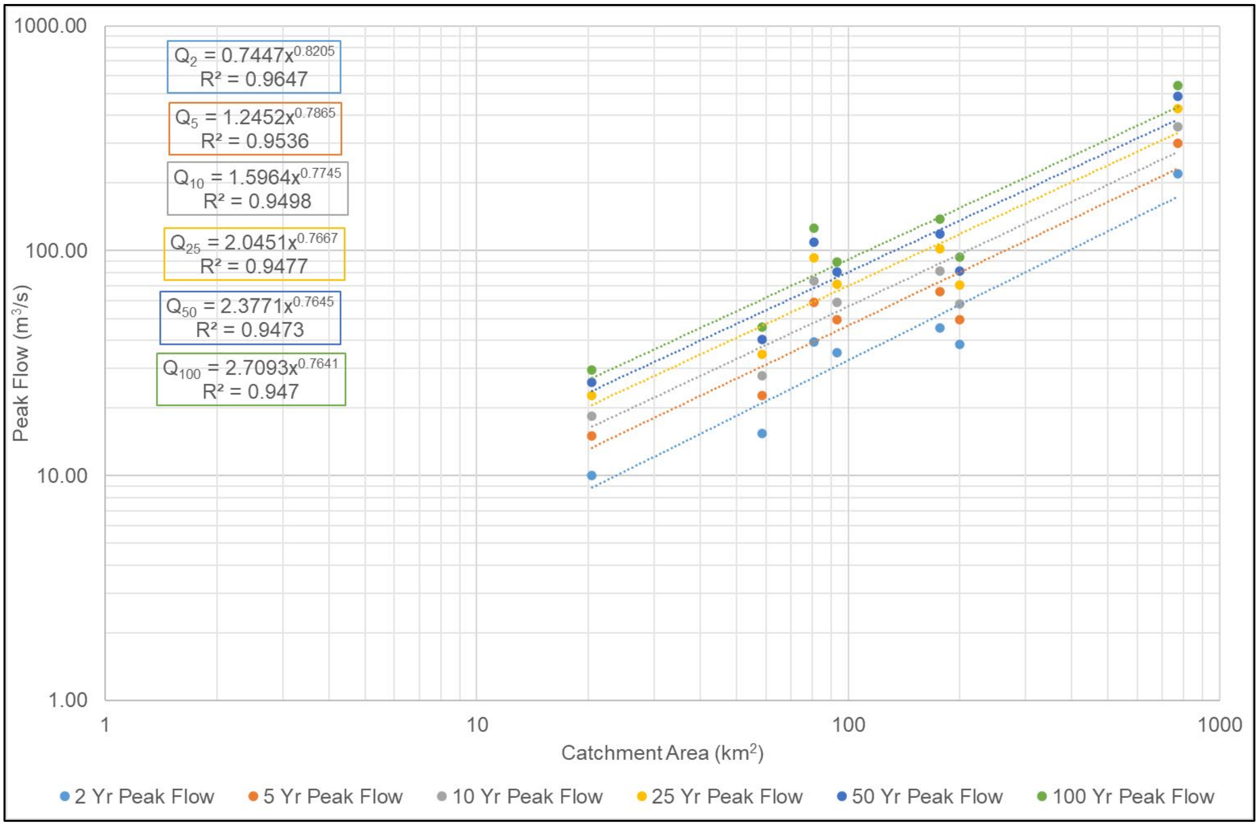

Figure 6.A.6 Regional Station Relationships Between Catchment Area and Peak Flows

The regional peak flow relationships were compared to the regional relationships developed for the NE and NW hydrologic regions by AMEC (2014) for an arbitrary watershed with a drainage area of 50 km² (Table 6.A.5). The relationships developed for the Project Area were found to have slightly higher flood flow rates. This is likely due to reducing the watershed size to fit the Project catchment, having removed any regulated stations, and removing stations with less than 15 years of data. The data used in the AMEC report (2014) included WSC data up to 2012, while the regional assessment for this Project included data up to 2023. The more conservative flood flows estimated for this study are used for the regional assessment.

Table 6.A.5 50 km² Drainage Area Regional Peak Flow Comparison (m³/s)

Flood Statistical Flow	Site-Specific Developed Relationship	AMEC (2014) Regional Flood Frequency Relationship – North East Region	AMEC (2014) Regional Flood Frequency Relationship – North West Region
Q2	18.12	16.03	18.73
Q5	26.57	22.36	25.44
Q10	32.55	26.66	29.76
Q50	46.76	36.19	39.50
Q100	53.30	40.30	43.50

Notes:
Q25 was not able to be directly compared as the AMEC (2014) report did not complete regression equations for this return period

6.A.2.2.4 Low Flows

The $7Q_{10}$ (seven-day average low flow for a 10-year return period) and the $7Q_{20}$ (seven-day average low flow for a 20-year period) are typical indicators of a drought conditions. The $7Q_{10}$ and $7Q_{20}$ low flow and catchment area relationships are presented in Figure 6.A.7 for the selected regional WSC stations. The R^2 is 0.997 for the two flow conditions, indicating a good level of correlation of the relationship between the return periods and their catchment areas.

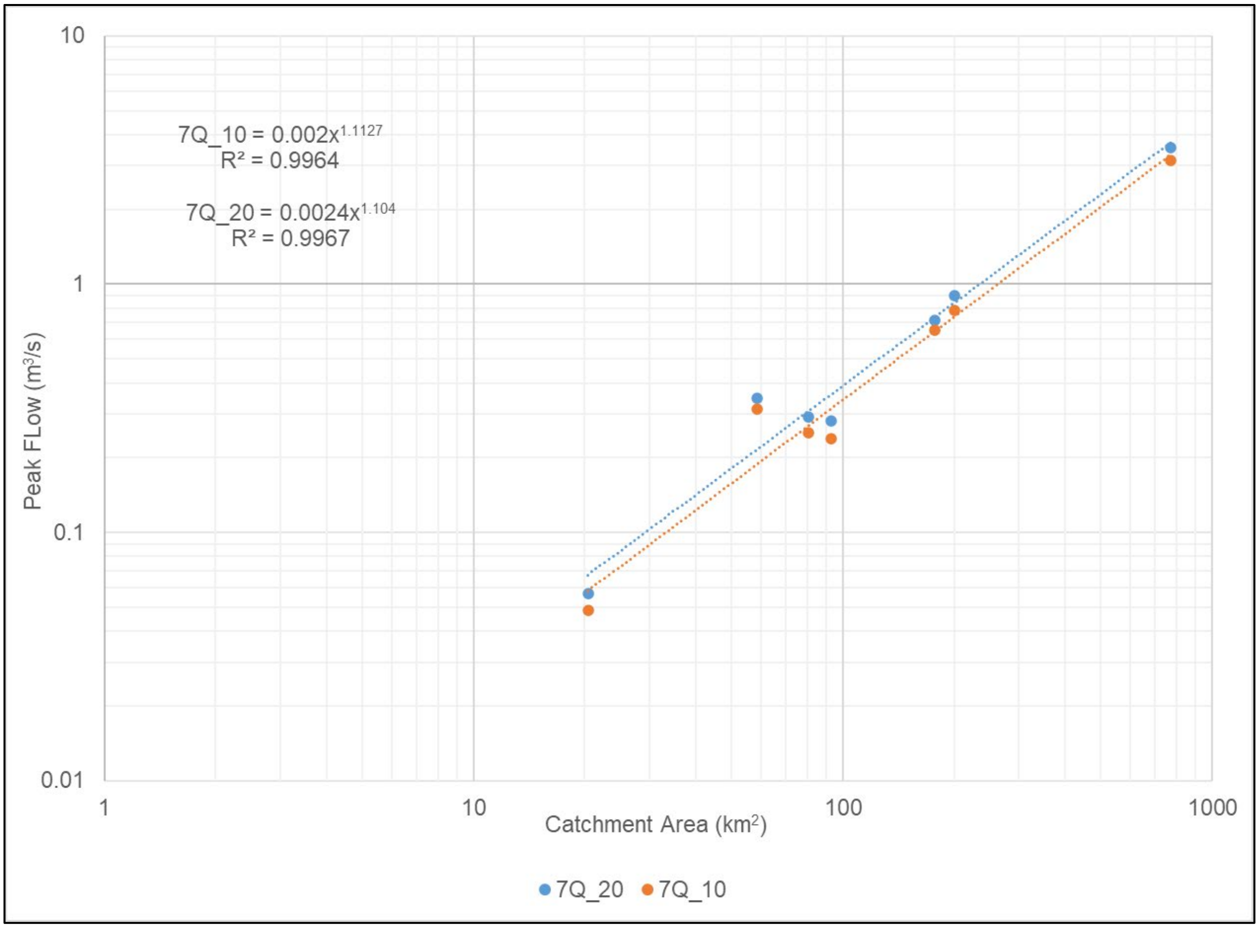

Figure 6.A.7 Regional Station Relationship Between Catchment Area and Low Flows

6.A.2.3 Local Hydrology Assessment

The relationships derived from the regional hydrology assessment were used to characterise the local hydrology within major watersheds and sub-watersheds. Mean annal flows, mean monthly flows, peak flows, and low flows were calculated for the local watersheds, and used to determine the environmental flows and environmental water balance for the Project. The updated local hydrology is presented in Table 6.A.6 for the mean annual flow, Table 6.A.7 for the mean monthly flow, Table 6.A.8 for the peak flows, and Table 6.A.9 for the low flows.

Table 6.A.6 Summary of Mean Annual Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Catchment Area (km^2)	MAF (m^3/s)
SB1	1.42	0.04
SB2	7.20	0.19
SB3	9.15	0.24
SB4	2.81	0.07
SB4A	1.11	0.03
SB5	18.31	0.49
SB6	19.12	0.51
SB7	22.83	0.61
SB7A	0.64	0.02
SB8	0.70	0.02
SB9	23.91	0.64
SB10	3.49	0.09
SB11	54.89	1.49
SB12	101.03	2.78
SB12A	0.34	0.01
SB13	0.67	0.02
SB13A	0.46	0.01
SB14	1.24	0.03
SB15	2.77	0.07
SB16	4.09	0.11
SB17	108.24	2.98
SB18	1.14	0.03
SB19	2.23	0.06
SB20	110.88	2.99
SB21	113.00	3.11
SB22	7.46	0.20
SB23	121.75	3.36
TB1	2.96	0.08

Table 6.A.7 Summary of Mean Monthly Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Area (km^2)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SB1	1.42	0.03	0.02	0.02	0.10	0.08	0.02	0.02	0.02	0.04	0.04	0.04	0.03
SB2	7.20	0.14	0.09	0.11	0.49	0.42	0.13	0.09	0.08	0.19	0.20	0.22	0.15
SB3	9.15	0.17	0.11	0.14	0.62	0.54	0.17	0.11	0.10	0.23	0.25	0.28	0.20
SB4	2.81	0.05	0.03	0.04	0.20	0.17	0.05	0.03	0.03	0.07	0.08	0.08	0.06
SB4A	1.11	0.02	0.01	0.01	0.08	0.07	0.02	0.01	0.01	0.03	0.03	0.03	0.02
SB5	18.31	0.33	0.23	0.30	1.24	1.07	0.37	0.22	0.20	0.45	0.49	0.56	0.41
SB6	19.12	0.35	0.24	0.32	1.29	1.11	0.38	0.23	0.21	0.47	0.51	0.58	0.43
SB7	22.83	0.41	0.29	0.39	1.54	1.33	0.46	0.27	0.25	0.56	0.61	0.70	0.52
SB7A	0.64	0.01	0.01	0.01	0.05	0.04	0.01	0.01	0.01	0.02	0.02	0.02	0.01
SB8	0.70	0.01	0.01	0.01	0.05	0.04	0.01	0.01	0.01	0.02	0.02	0.02	0.01
SB9	23.91	0.43	0.31	0.41	1.61	1.39	0.49	0.29	0.26	0.59	0.63	0.73	0.55
SB10	3.49	0.07	0.04	0.05	0.24	0.21	0.06	0.04	0.04	0.09	0.10	0.10	0.07
SB11	54.89	0.96	0.74	1.00	3.65	3.17	1.19	0.65	0.60	1.31	1.43	1.71	1.31
SB12	101.03	1.73	1.42	1.96	6.66	5.79	2.28	1.19	1.10	2.35	2.60	3.19	2.48
SB12A	0.34	0.01	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.01
SB13	0.67	0.01	0.01	0.01	0.05	0.04	0.01	0.01	0.01	0.02	0.02	0.02	0.01
SB13A	0.46	0.01	0.00	0.01	0.03	0.03	0.01	0.01	0.00	0.01	0.01	0.01	0.01
SB14	1.24	0.02	0.01	0.02	0.09	0.07	0.02	0.02	0.01	0.03	0.04	0.04	0.02
SB15	2.77	0.05	0.03	0.04	0.19	0.16	0.05	0.03	0.03	0.07	0.08	0.08	0.06
SB16	4.09	0.08	0.05	0.06	0.28	0.24	0.07	0.05	0.04	0.11	0.11	0.12	0.08
SB17	108.24	1.85	1.53	2.11	7.12	6.20	2.45	1.27	1.18	2.51	2.78	3.42	2.67
SB18	1.14	0.02	0.01	0.01	0.08	0.07	0.02	0.01	0.01	0.03	0.03	0.03	0.02
SB19	2.23	0.04	0.02	0.03	0.16	0.13	0.04	0.03	0.02	0.06	0.06	0.07	0.04
SB20	110.88	1.86	1.53	2.12	7.15	6.23	2.46	1.27	1.18	2.52	2.79	3.43	2.68

Table 6.A.7 Summary of Mean Monthly Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Area (km^2)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SB21	113.00	1.93	1.60	2.21	7.43	6.47	2.57	1.32	1.23	2.62	2.90	3.57	2.79
SB22	7.46	0.14	0.09	0.11	0.51	0.44	0.14	0.09	0.08	0.19	0.20	0.22	0.16
SB23	121.75	2.08	1.73	2.40	8.00	6.97	2.78	1.42	1.32	2.81	3.12	3.85	3.02
TB1	2.96	0.06	0.03	0.04	0.21	0.18	0.05	0.04	0.03	0.08	0.08	0.09	0.06

Table 6.A.8 Summary of Peak Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Catchment Area (km^2)	Q2	Q5	Q10	Q25	Q50	Q100
SB1	1.42	0.99	1.64	2.09	2.67	3.10	3.54
SB2	7.20	3.76	5.88	7.37	9.29	10.75	12.25
SB3	9.15	4.58	7.10	8.87	11.16	12.91	14.71
SB4	2.81	1.74	2.81	3.55	4.52	5.24	5.97
SB4A	1.11	0.81	1.35	1.73	2.22	2.57	2.93
SB5	18.31	8.09	12.26	15.18	19.00	21.95	24.99
SB6	19.12	8.38	12.68	15.69	19.65	22.69	25.83
SB7	22.83	9.70	14.58	18.00	22.51	25.98	29.57
SB7A	0.64	0.52	0.88	1.13	1.45	1.69	1.93
SB8	0.70	0.56	0.94	1.21	1.56	1.81	2.06
SB9	23.91	10.07	15.12	18.66	23.32	26.92	30.64
SB10	3.49	2.08	3.33	4.21	5.34	6.19	7.05
SB11	54.89	19.92	29.06	35.51	44.09	50.80	57.81
SB12	101.03	32.86	46.96	56.96	70.39	80.99	92.14
SB12A	0.34	0.31	0.53	0.69	0.89	1.04	1.19
SB13	0.67	0.54	0.91	1.17	1.50	1.75	2.00
SB13A	0.46	0.39	0.67	0.87	1.12	1.31	1.49
SB14	1.24	0.89	1.47	1.89	2.41	2.80	3.19
SB15	2.77	1.72	2.77	3.51	4.47	5.18	5.90
SB16	4.09	2.37	3.77	4.75	6.02	6.98	7.95
SB17	108.24	34.77	49.58	60.09	74.21	85.38	97.13
SB18	1.14	0.83	1.38	1.77	2.26	2.63	2.99
SB19	2.23	1.44	2.34	2.97	3.78	4.39	5.00
SB20	108.65	34.88	49.73	60.26	74.43	85.62	97.41
SB21	113.00	36.02	51.29	62.12	76.70	88.23	100.37
SB22	7.46	3.87	6.05	7.57	9.55	11.05	12.58
SB23	121.75	38.29	54.38	65.82	81.22	93.41	106.26
TB1	2.96	1.81	2.92	3.70	4.70	5.45	6.21

Table 6.A.9 Summary of Low Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Catchment Area (km^2)	7Q10	7Q20
SB1	1.42	0.003	0.004
SB2	7.20	0.018	0.021
SB3	9.15	0.023	0.028
SB4	2.81	0.006	0.008
SB4A	1.11	0.002	0.003
SB5	18.31	0.051	0.059
SB6	19.12	0.053	0.062
SB7	22.83	0.065	0.076
SB7A	0.64	0.001	0.001
SB8	0.70	0.001	0.002
SB9	23.91	0.068	0.080
SB10	3.49	0.008	0.010
SB11	54.89	0.172	0.200
SB12	101.03	0.340	0.392
SB12A	0.34	0.001	0.001
SB13	0.67	0.001	0.002
SB13A	0.46	0.001	0.001
SB14	1.24	0.003	0.003
SB15	2.77	0.006	0.007
SB16	4.09	0.010	0.011
SB17	108.24	0.367	0.423
SB18	1.14	0.002	0.003
SB19	2.23	0.005	0.006
SB20	108.65	0.369	0.425
SB21	113.00	0.385	0.443
SB22	7.46	0.019	0.022
SB23	121.75	0.418	0.481
TB1	2.96	0.007	0.008

The environmental flows and environmental water balance for the Project Area were calculated using the relationships derived from the regional assessment and the Thornthwaite equation and are discussed in Section 6.A.2.3.1 and 6.A.2.3.2, respectively.

6.A.2.3.1 Environmental Flows

The summer and winter environmental flows were determined as 50% and 30% of the MAF, respectively. Table 6.A.10 shows the summary of the summer and winter environmental flow for the watersheds within the LAA.

Table 6.A.10 Summary of Environmental Flows (m^3/s) for Watersheds within the LAA

Sub-watershed ID	Catchment Area (km^2)	Summer Env. Flow (50% MAF)	Winter Env. Flow (30% MAF)
SB1	1.42	0.018	0.011
SB2	7.20	0.094	0.057
SB3	9.15	0.120	0.072
SB4	2.81	0.036	0.022
SB4A	1.11	0.014	0.008
SB5	18.31	0.244	0.146
SB6	19.12	0.255	0.153
SB7	22.83	0.305	0.183
SB7A	0.64	0.008	0.005
SB8	0.70	0.009	0.005
SB9	23.91	0.320	0.192
SB10	3.49	0.045	0.027
SB11	54.89	0.746	0.447
SB12	101.03	1.388	0.833
SB12A	0.34	0.004	0.003
SB13	0.67	0.008	0.005
SB13A	0.46	0.006	0.003
SB14	1.24	0.016	0.009
SB15	2.77	0.036	0.021
SB16	4.09	0.053	0.032
SB17	108.24	1.489	0.894
SB18	1.14	0.014	0.009
SB19	2.23	0.029	0.017
SB20	108.65	1.495	0.897
SB21	113.00	1.556	0.934
SB22	7.46	0.098	0.059
SB23	121.75	1.679	1.007
TB1	2.96	0.038	0.023

6.A.2.3.2 Environmental Water Balance

The environmental water balance was modelled based on the available 1991-2020 climate normal conditions for the climate station Middle Arm (Station ID 8402644).

Input parameters into the Thornthwaite equation used by the United Stations Geological Survey (USGS) are presented in Table 6.A.11. The soil moisture storage capacity value was based on the predominant hummocky till soil that is typically derived of unsorted clay, silt, sand, gravel, and boulders that has medium to poor drainage. The soil type was assumed to be type C in a forested area that has medium-poor drainage (400 millimetre (mm) of water holding capacity). As the Project Area is expected to have some areas of exposed rock and soil depths that may be minimal in some locations, the soil moisture storage capacity was adjusted to 200 mm for those areas.

Table 6.A.11 Environmental Water Balance Input Parameters

Input Parameters (units)	Values
Run-off Factor (-)	0.5
Total Water (-)	1
Topography Factor	0.1
Soils Factor (-)	0.2
Cover Factor (-)	0.2
Direct Run-off Factor (-)	0.05
Soil Moisture Storage Capacity (mm)	200
Latitude of Location (º)	49
Rain Temperature Threshold (ºC)	0.0
Snow Temperature Threshold (ºC)	0.0
Maximum Melt Rate (-)	0.5

Note:
'-' indicates there is no associated unit for the input parameter

The environmental water balance presented in Table 6.A.12 shows an annual precipitation of 1214.5 mm, with an actual evapotranspiration of 438.9 mm and excess precipitation of 775.6 mm. The excess precipitation was obtained by subtracting the actual precipitation from the precipitation. Excess precipitation incorporated snow storage, overland runoff, and infiltration all of which will eventually report to surface watercourses as total streamflow. Based on the Thornthwaite model, 775.6 mm of precipitation would not be evaporated.

The environmental water balance for the wetted and driest years are shown in Tables 6.A.13 and 6.A.14, respectively.

Table 6.A.12 Environmental Water Balance for the Climate Normal Period from 1991-2020

Parameters (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation	95.8	94.1	76.1	80.2	95.8	100.9	105	105.3	119	124.1	113.1	105.1	1214.5
Actual ET	6.5	7.6	13.8	27.8	48.2	71	95	80.4	45.1	23.8	12.1	7.6	438.9
Potential ET	6.8	8.2	15.5	27.8	48.2	71	95	80.4	45.1	23.8	12.1	7.6	441.5
Excess Precipitation	89.3	86.5	62.3	52.4	47.6	29.9	10	24.9	73.9	100.3	101	97.5	775.6
Total Streamflow	21.9	11	5.5	105.9	123.5	100	66.7	51.6	66	86.2	93.3	43.8	775.4
Storage Change	67.4	75.5	56.8	-53.5	-75.9	-70.1	-56.7	-26.7	7.9	14.1	7.7	53.7	0.2
Groundwater Recharge	8.8	4.4	2.2	42.4	49.4	40.0	26.7	20.6	26.4	34.5	37.3	17.5	310.2
Overland flow	13.1	6.6	3.3	63.5	74.1	60.0	40.0	31.0	39.6	51.7	56.0	26.3	465.2

Table 6.A.13 Environmental Water Balance for the Wettest Year - 2011

Parameters (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation	171.2	169.2	84	52.6	103.8	201.8	161.3	65.8	118.9	293	37.2	79	1537.8
Potential ET	8.4	8.1	16.3	27.5	47.3	60.5	86.3	76.5	46.3	24.1	12	7.8	421.1
Actual ET	8.1	7.5	14.4	27.5	47.3	60.5	86.3	76.5	46.3	24.1	12	7.8	418.3
Excess Precipitation	163.1	161.7	69.6	25.1	56.5	141.3	75	-10.7	72.6	268.9	25.2	71.2	1119.5
Total Streamflow	23.8	11.9	5.9	123.8	154.4	181.7	143.1	71.7	77.4	181.4	96.9	47.5	1119.5
Storage Change	139.3	149.8	63.7	-98.7	-97.9	-40.4	-68.1	-82.4	-4.8	87.5	-71.7	23.7	0.0
Groundwater Recharge	9.5	4.8	2.4	49.5	61.8	72.7	57.2	28.7	31.0	72.6	38.8	19.0	447.8
Overland flow	14.3	7.1	3.5	74.3	92.6	109.0	85.9	43.0	46.4	108.8	58.1	28.5	671.7

Table 6.A.14 Environmental Water Balance for the Driest Year - 1989

Parameters (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation	78	6	27	18	85.7	52.2	50.8	124.4	76.4	113	164.4	58	853.9
Potential ET	6.5	7.5	14.3	32	60.2	84.7	108.3	86.5	49.9	23.7	11.9	6.7	492.2
Actual ET	6.3	7	12.8	32	60.2	84.7	108.3	86.5	49.9	23.7	11.9	6.7	490
Excess Precipitation	71.7	-1	14.2	-14	25.5	-32.5	-57.5	37.9	26.5	89.3	152.5	51.3	363.9
Total Streamflow	23.6	11.8	5.9	22.2	46.7	23.8	13.1	11.5	8.9	50	102.6	47.2	367.3
Storage Change	48.1	-12.8	8.3	-36.2	-21.2	-56.3	-70.6	26.4	17.6	39.3	49.9	4.1	-3.4
Groundwater Recharge	9.4	4.7	2.4	8.9	18.7	9.5	5.2	4.6	3.6	20.0	41.0	18.9	146.9
Overland flow	14.2	7.1	3.5	13.3	28.0	14.3	7.9	6.9	5.3	30.0	61.6	28.3	220.4

6.A.3 References

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Appendix 6.B Desktop Historical Surface Water Quality Data Review

6.B.1 Desktop Review

Historical surface water quality studies have been predominantly conducted in support of assessing discharge and potential effects from historical mining activities at or near the Project Area. Results from the following three studies were identified as having relevant historical surface water quality data within the Project Area and Local Assessment Area (LAA):

- Seasonal and Mining Influences on Stream-Water Geochemistry (McConnell 1995)
- Sources of Acid-Mine Drainage (McConnell 2002)
- Aquatic Survey (AMEC 2008)
- Surface Water and Sediment Quality Sampling Program (GEMTEC 2019)
- Environmental Effects Monitoring (Stantec 2013, 2019, 2023)

Local water quality data provides a robust baseline dataset, with over 40 samples collected for laboratory analysis for total metals, general chemistry, cyanide and radium-226 parameters at various locations across the Project Area and LAA over the last 16 years. The monitored parameters represent the typical Parameters of Potential Concern (PoPCs) associated with hard rock mining activities. Surface water quality data from the larger scale LAA provides a greater areal coverage with less monitoring frequency over the same period than in comparison to the Project Area. By considering the historical local surface water quality data, existing water quality conditions for the Project Area and LAA can be established, including reference water quality for surface water features not impacted by historical mining activities.

Surface water quality data from the monitoring sites was classified into the following categories to represent geographic conditions, relationship to the proposed final discharge point (FDP) for the Project and in relation to historical mining activities:

- Reference - represent surface water features upstream of the proposed Project Area and are outside of the influence of historical mining activities (i.e., natural background sites)
- Project Area - represent surface water features located within the proposed Project Area that may or may not be impacted by historical mining activities
- Upstream South Brook - represent surface water features on the South Brook channel located upstream of the proposed FDP and potentially influenced by historical mining activities
- Downstream South Brook - represent surface water features located downstream of the FPD and potentially influenced by historical mining activities

6.B.1.1 McConnell Surface Water Quality Studies (McConnell 1995, 2002)

In 1993 and 2001, surface water quality sampling programs were conducted to determine the effects of historical mining activities on surface water features (McConnell 1995) and to determine the sources of acid-mine drainage (McConnell 2002), respectively, in the vicinity of the Historical Tailings Area.

Fifty-four surface water samples from 28 sites were collected in June and August 1993, acting as seasonal duplicates. Samples were analyzed for pH, conductivity, and metals/metalloids. Results analysis focused on pH, copper, lead, and zinc within a 30 km^2 area around the Historical Tailings Area. The following is a summary of the analytical results:

- The highest concentrations of copper (1,980 parts per billion (i.e., microgram per litre [µg/L])), lead (34 µg/L), and zinc (3,090 µg/L) and the most acidic pH values (<4.5) were observed at locations downstream of the Historical Tailings Area.
- South Brook was sampled upstream of the tailings dam (located at the outlet of Little Rambler Pond; Figure 6.3.1 of the Environmental Registration), at the tailings dam, and downstream of the tailings dam. Concentrations of copper, lead, and zinc were notably higher in samples collected at and downstream of the tailings dam. pH values were more acidic at and downstream of the tailings dam than at samples collected upstream.

In 2001, 45 surfaces water samples were collected within and in the vicinity of the Historical Tailings Area (McConnell 2002). Samples were analyzed for pH, conductivity, and metals/metalloids. Based on the results of the copper analysis, McConnell (2002) categorized and compared the surface water sites into two groups: background sites (i.e., sites with copper values <5 µg/L) and mine-affected sites (i.e., sites with copper values >5 µg/L). Table 6.B.1 summarizes the surface water quality statistics for select parameters from the McConnell (2002) analytical program. Parameters presented in Table 6.B.1 were selected based on exceedances of Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQG-FAL) and *Metal and Diamond Mining Effluent Regulations* (MDMER) Schedule 4, Table 2 Maximum Authorized Monthly Mean Concentration.

Table 6.B.1 Summary of CWQG-FAL and MDMER Exceedances of Surface Water Quality Data from McConnell Surface Water Quality Studies (McConnell 1995; 2002)

Parameter	Unit	Guideline	Background Sites (<5 µg/L Cu)			Mine-Affected Sites (>5 µg/L Cu)		
			Med	Min	Max	Med	Min	Max
Manganese guideline (µg/L):			430	380	430	380	380	490
Aluminum[1]	µg/L	5/100[A]	**83**	**13**	**323**	**949**	**66**	**5,284**
Copper[2]	µg/L	2[A]; 300[B]	0.1	0.1	**2.9**	**254**	**6.2**	**7,066**
Iron	µg/L	300[A]	269	70	**676**	**1,994**	177	**62,480**
Lead[3]	µg/L	1[A] / 100[B]	0.1	0.1	0.5	**2.1**	0.1	**173**
Manganese[4]	µg/L	Variable[A]	16	8	349	**581**	4	**6,775**
Nickel[5]	µg/L	25[A] / 500[B]	0.1	0.1	2.54	10.7	0.1	**86.2**
pH	pH units	6.5-9.0[A]	**6.36**	**5.4**	7.43	**4.18**	**2.86**	6.73
Zinc	µg/L	500[B]	0.1	0.1	2.93	500	5.54	**5,760**

Notes:
Bold – Concentration exceeds the CWQG-FAL guideline.
Underlined – Concentration exceeds the MDMER guideline.
Bold and Underlined – Concentrations exceeds both the CWQG-FAL and MDMER guidelines.
Cu – copper; Med – median; Min – minimum; Max – maximum
[1] The CWQG-FAL aluminum guideline is dependent on pH. If pH < 6.5, the guideline is 5 µg/L. If pH ≥ 6.5, the guideline is 100 µg/L.
[2] The CWQG-FAL copper guideline is dependent on water hardness. If water hardness is unknown, the guideline is 2 µg/L. Guideline = $0.2 * e^{\{0.8545[\ln(hardness)]-1.465\}}$
[3] The CWQG-FAL lead guideline is dependent on water hardness. If water hardness is unknown, the guideline is 1 µg/L. Guideline = $e^{\{1.273[\ln(hardness)]-4.705\}}$
[4] The CWQG-FAL dissolved manganese guideline is dependent on pH and water hardness. If water hardness is unknown, a default value of 50 mg/L is used. Guideline = exp(0.878[ln(hardness)+4.76).
[5] The CWQG-FAL nickel guideline is dependent on water hardness. If water hardness is unknow, the guideline is 25 µg/L. Guideline = $e^{\{0.76[\ln(hardness)]+1.06\}}$
[A] CCME Water Quality Guidelines for the Protection of Aquatic Life, Freshwater
[B] MDMER Schedule 4, Table 2, Maximum Authorized Monthly Mean Concentration

6.B.1.1.1 Background Sites

Five sites sampled for the McConnell (2002) sampling program were identified as background sites (Figure 6.B.1). Two of these sites are located upstream of Big Rambler Pond, and three are located southeast of the Historic East Mine, all south of Highway 414.

CWQG-FAL exceedances of aluminum, copper, iron, and pH were reported for the background sites. No exceedances of MDMER were reported for the background sites.

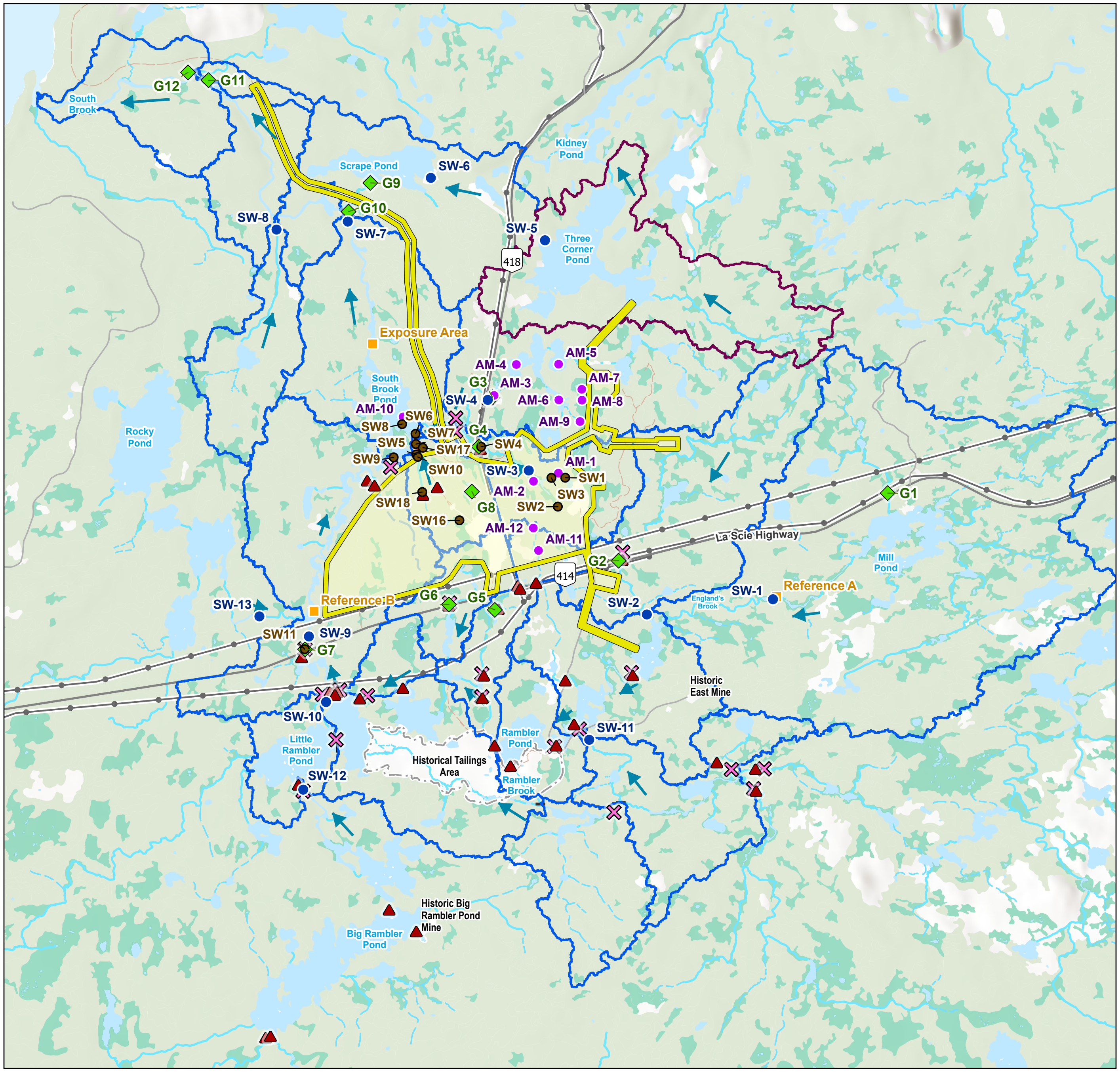


Figure No.

6.B.1

Title

Existing and Historical Surface Water Quality Monitoring Stations

Client/Project
FireFly Metals Ltd
Green Bay Copper-Gold Project

121418199_2_005

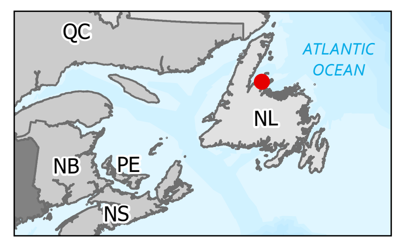
Project Location
Baie Verte, NL

Prepared by MB on 2025-03-27

N

0 500 1,000
Metres
(At original document size of 8.5x11)
1:56,000

Surface Water Quality Monitoring Stations
- Stantec 2024
- Stantec 2019 Phase 3 EEM
- GEMTEC 2019
- AMEC 2008
- Golder 2006
- McConnel 2002
- McConnel 1995
- Final Discharge Point (FDP)
- Project Area
- South Brook subcatchment
- Three Corner Pond subcatchment
- Dam
- Flow Direction
- Resource Road / Trail
- Highway
- Arterial / Collector
- Powerline
- Highway
- Arterial / Collector
- Indeterminate Stream
- Intermittent Watercourse
- Definite Watercourse
- Waterbody
- Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, GEMTEC, McConnel, Stantec
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

V:\1214\active\121418199\03_data\gis_cad\gis_data\mapping\aprx\2_121418199_FireFlyMetals_GreenBayCuAu_Aquatics\121418199_FFM_MingMine_SW.aprx Revised: 2025-03-27 By: mblackwood

6.B.1.1.2 Mine-Affected Sites

Twenty-five sites sampled for the McConnell (2002) sampling program were identified as mine-affected sites (Figure 6.B.1). Most of these sites are located south of Highway 414, in the vicinity of the Historic Big Rambler Pond Mine, the Historical Tailings Area, and the Historic East Mine. Four sites are located north of Highway 414 in the vicinity of the Ming West Mine (Figure 6.B.1).

CWQG-FAL exceedances were reported for the parameters listed in Table 6.B.1, except for zinc. MDMER exceedances were reported for copper, lead, and zinc.

6.B.1.1.3 Comparison of Background Sites and Mine-Affected Sites

Based on results presented in Table 6.B.1, the mine-affected sites generally reported higher concentrations of metals and more acidic pH values than the background sites.

6.B.1.2 Aquatic Survey (AMEC 2008)

In 2008, AMEC conducted an aquatic survey to assess potential locations for tailings disposal within the South Brook drainage basin (AMEC 2008). Surface water samples for one monitoring event were collected from 12 ponds in the LAA over the course of 22 days between June and July 2008. Locations of ponds included in the aquatic survey are shown on Figure 6.B.1. AMEC (2008) selected five ponds to be sampled and analyzed for general chemistry parameters and total metals. These locations include Vincers Pond (AM-1 on Figure 6.B.1), Keneachel Pond (AM-4), Three Boulder Pond (AM-5), Jesse’s Pond (AM-7), and South Brook Pond (AM-10).

Table 6.B.2 summarizes the surface water quality results for select parameters from the aquatic survey. Laboratory water quality analysis for Keneachel Pond (AM-4), Three Boulder Pond (AM-5), Jesse’s Pond (AM-7) only analysed for a limited list of metals parameters in comparison to Vincer’s Pond (AM-1) and South Brook Pond (AM-10). Parameters presented in were selected based on exceedances of the CWQG-FAL values to identify PoPCs.

Table 6.B.2 Summary of CWQG-FAL Exceedances of Surface Water Quality Data from Aquatic Survey (AMEC 2008)

Parameter	Units	Vincers Pond	Keneachel Pond	Three Boulder Pond	Jesse's Pond	South Brook Pond
	Site Type[1]	Project Area	Reference	Reference	Project Area (Reference)	Downstream South Brook
	Figure 6.B.1 Reference	AM-1	AM-4	AM-5	AM-7	AM-10
Results						
Total Aluminum	µg/L	**2,500**	60	58	18	**350**
Total Cadmium	µg/L	**8.3**	-	-	-	-
Total Copper	µg/L	**4,700**	-	-	-	**55**
Total Iron	µg/L	**17,000**	74	93	110	**2,500**
Total Lead	µg/L	**2.9**	-	-	-	**1.3**
Total Manganese	µg/L	**410**	5	11	9	120
pH, Field	-	**4.12**, **3.94**	7.98, 8.05	8.16	8.17	**6.19**, **5.11**, **5.87**, **5.82**
Total Zinc	µg/L	-	-	-	-	**83**
Guidelines						
Total Aluminum[2]	µg/L	5[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]
Total Cadmium[3]	µg/L	1.2[A] / 0.1[B]; 7[C]	0.22[A] / 0.04[B]; 7[C]	0.28[A] / 0.04[B]; 7[C]	0.26[A] / 0.04[B]; 7[C]	0.24[A] / 0.04[B]; 7[C]
Total Copper[4]	µg/L	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]
Total Iron	µg/L	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]
Total Lead[5]	µg/L	1[B]; 5[C]	1[B]; 5[C]	1[B]; 5[C]	1[B]; 5[C]	1[B]; 5[C]
Dissolved Manganese[6]	µg/L	380[A]; 120[C] / 20[D]	210[A]; 120[C] / 20[D]	160[A]; 120[C] / 20[D]	160[A]; 120[C] / 20[D]	190[A]; 120[C] / 20[D]

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Table 6.B.2 Summary of CWQG-FAL Exceedances of Surface Water Quality Data from Aquatic Survey (AMEC 2008)

Parameter	Units	Vincers Pond	Keneachel Pond	Three Boulder Pond	Jesse's Pond	South Brook Pond
	Site Type[1]	Project Area	Reference	Reference	Project Area (Reference)	Downstream South Brook
	Figure 6.B.1 Reference	AM-1	AM-4	AM-5	AM-7	AM-10
pH	-	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]
Dissolved Zinc[7]	µg/L	60[A] / 32[B]; 5,000[D]	21[A] / 7[B]; 5,000[D]	25[A] / 6[B]; 5,000[D]	22[A] / 5[B]; 5,000[D]	24[A] / 27[B]; 5,000[D]

Notes:
Underlined – Concentration exceeds the CWQG-FAL Short-Term Guideline
Bold – Concentration exceeds the CWQG-FAL Long-Term Guideline
Underlined & Bold – Concentration exceeds both the CWQG-FAL Short-Term and Long-Term values
"-" parameter was not detected at a concentration greater than the laboratory reporting limit
1 Site classified based on relation to the Project Area (Reference – upstream of Project activities and outside the influence of historical mining activities; Project Area – located within the proposed Project Area; Upstream – upstream of the Project Area and potentially influenced by historical mining activities; Downstream – downstream of the Project Area and potentially influenced by historical mining activities)
2 Aluminum guideline varies depending on pH: 5 µg/L if pH < 6.5; 100 µg/L if pH ≥ 6.5
3 Cadmium guideline is calculated using an equation based on water hardness: short-term guideline = $10^{\{1.016(\log[\text{hardness}])-1.71\}}$; long-term guideline = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$
4 Copper guideline is calculated using an equation based on water hardness: long-term guideline = 0.2 * $e^{\{0.8545[\ln(\text{hardness})-1.465\}}$
5 Lead guideline is calculated using an equation based on water hardness: long-term guideline = $e^{\{1.273[\ln(\text{hardness})]-4.705}$
6 Manganese guideline is calculated using an equation based on water hardness: short-term guideline = exp(0.878[ln(hardness)]+4.76
7 Zinc guideline is calculated using an equation based on dissolved organic carbon, pH, and water hardness: short-term guideline = exp(0.833[ln(hardness)]+0.240[ln(DOC)]+0.526; long-term guideline = exp(0.947[ln(hardness)]-0.815[pH]+0.398[ln(DOC)]+4.625)
A CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Short-Term Guideline
B CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Long-Term Guideline
C Health Canada Guidelines for Canadian Drinking Water Quality, Maximum Acceptable Concentration
D Health Canada Guidelines for Canadian Drinking Water Quality, Aesthetic Objective or Operational Guidance Value

6.B.1.2.1 Reference Sites

Two of the ponds sampled during the aquatic survey (AMEC 2008) were classified as Reference sites (Keneachel Pond [AM-4] and Three Boulder Pond [AM-5]). Both ponds are located east of Highway 418, approximately 1,250 metres (m) north of the Boundary Shaft (Figure 6.B.1) and are connected to each other, with Three Boulder Pond located upstream of Keneacheal Pond.

The Reference sites reported similar concentrations of total aluminum, total iron, total manganese, and field pH. Total aluminum concentrations at the two Reference sites ranged from 58 µg/L (Three Boulder Pond) to 60 µg/L (Keneachel Pond); total iron concentrations ranged from 74 µg/L (Keneachel Pond) to 93 µg/L (Three Boulder Pond); total manganese concentrations ranged from 5 µg/L (Keneachel Pond) to 11 µg/L (Three Boulder Pond); and field pH ranged from 7.98 / 8.05 (Keneachel Pond) to 8.16 (Three Boulder Pond). These concentrations are not in exceedance of the CWQG-FAL or Guidelines for Canadian Drinking Water Quality (GCDWQ) guidelines. Based on these results, Keneachel Pond and Three Boulder Pond are considered to represent baseline conditions not influenced by historical local mining activities.

6.B.1.2.2 Project Area Sites

Two of the ponds sampled during the aquatic survey (AMEC 2008) were classified as Project Area sites – Vincers Pond and Jesse's Pond. Vincers Pond is located adjacent to the Boundary Shaft. Jesse's Pond is located east of Highway 418, approximately 1,000 m north of the Boundary Shaft (Figure 6.B.1).

Vincers Pond reported CWQG-FAL exceedances of total aluminum (2,500 µg/L), total cadmium (8.3 µg/L), total copper (4,700 µg/L), total iron (17,000 µg/L), total lead (2.9 µg/L), and total manganese (410 µg/L), and pH (3.94 and 4.12). These parameters, except for total lead, also reported exceedances of applicable GCDWQ guidelines. Jesse's Pond reported concentrations of total aluminum (18 µg/L), total iron (110 µg/L), and total manganese (9 µg/L), which were below the CWQG-FAL values. These parameters did not exceed GCDWQ guidelines. Based on these results, Vincers Pond water quality is considered to be affected by historical mining activities, whereas Jesse's Pond water quality is considered to be unaffected by historical mining activities and represents a Reference site.

6.B.1.2.3 Upstream South Brook Sites

None of the ponds that were sampled during the aquatic survey (AMEC 2008) were classified as Upstream South Brook sites.

6.B.1.2.4 Downstream South Brook Sites

South Brook Pond (P01) was classified as a Downstream South Brook site. South Brook Pond is located approximately 400 m west of Highway 418 (Figure 6.B.1).

South Brook Pond reported CWQG-FAL exceedances of total aluminum (350 µg/L), total copper (55 µg/L), total iron (2,500 µg/L), total lead (1.3 µg/L), pH (5.11, 5.82, 5.87, 6.19), and total zinc (83 µg/L). Based on these results, South Brook Pond water quality is considered to be influenced by historical mining activities. These parameters, except for total copper, total lead, and total zinc, also reported exceedances of applicable GCDWQ guidelines.

6.B.1.3 Surface Water and Sediment Quality Sampling Program (GEMTEC 2019)

In 2019, GEMTEC conducted a surface water and sediment sampling program that assessed the environmental conditions in the vicinity of the historical Ming Mine area (GEMTEC 2019). Surface water samples were collected from three areas around the historical Ming Mine area: Ming Mine, Boundary Shaft, and South Brook Pond (Figure 6.3.3 of the Environmental Registration). These locations are downstream of historical mining activities and tailings areas and within the Project Area. Fifteen surface water samples were collected from one monitoring event in October 2018 and were analyzed for general chemistry parameters and a total metals package.

Table 6.B.3 summarizes the surface water quality results for select parameters for the GEMTEC (2019) surface water quality sampling program. Parameters presented in were selected based on reported exceedances of the CWQG-FAL values.

Table 6.B.3 Summary of CWQG-FAL Exceedances of Surface Water Quality Data from 2019 Sampling Program (GEMTEC 2019)

Parameter	Units	Boundary Shaft				Ming Mine			South Brook Pond / South Brook							
		SW1	SW2	SW3	SW4	SW16	SW16A	SW18	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW17
Site Type[1]		Project Area	Project Area	Project Area	Project Area	Project Area	Project Area	Project Area	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Upstream South Brook	Downstream South Brook
Results																
Total Aluminum	µg/L	**11,000**	**154**	**8,090**	**2,870**	**2,250**	**2,000**	**564**	**4,570**	**499**	**340**	**560**	**554**	**350**	**751**	**104**
Total Arsenic	µg/L	**90**	-	**16**	2	-	-	-	**181**	-	3	-	-	-	3	-
Total Cadmium	µg/L	12.4	-	8.84	4.59	95.2	73.2	5.36	73.7	1.34	5.65	2.65	0.63	3.15	0.94	1.28
Total Copper	µg/L	**12,000**	**9**	**7,990**	**3,760**	**7,950**	**7,900**	**680**	**6,210**	**878**	**581**	**303**	**133**	**460**	**176**	**33**
Total Iron	µg/L	**73,800**	**874**	**35,200**	**5,480**	**532**	**531**	**476**	**20,600**	**602**	**709**	**2,720**	**3,680**	295	**2,340**	-
Total Lead	µg/L	**9.8**	-	**7.9**	**3**	**10.2**	**10.6**	**2.7**	**24.8**	-	0.9	**1.9**	**2.3**	**1.2**	**3.3**	-
Total Manganese	µg/L	829	146	671	609	4,280	4,830	858	4,540	1,010	573	296	204	531	208	186
Total Nickel	µg/L	38	-	27	15	99	121	11	43	**65**	7	4	3	6	4	2
Nitrite (as N)	mg/L	-	-	-	-	0.06	**0.1**	-	**0.09**	-	-	-	-	-	-	-
pH, Lab	-	**2.91**	**6.33**	**3.04**	**3.28**	**4.74**	**4.87**	**5.38**	7.06	**4.74**	6.53	**4.24**	**4.20**	6.61	**4.02**	6.67
Total Selenium	µg/L	**2**	-	-	-	**10**	**10**	-	**16**	-	**2**	-	-	-	-	-
Total Thallium	µg/L	-	-	-	-	**1.3**	**1.4**	0.1	0.6	-	0.1	-	-	-	-	-
Total Zinc	µg/L	**3,610**	-	**2,640**	**885**	**21,100**	**16,900**	**1,330**	**11,300**	**262**	**941**	**561**	**179**	**792**	**260**	**139**
Guidelines																
Aluminum[2]	µg/L	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]	5[B]; 2,900[C] / 100[D]	100[B]; 2,900[C] / 100[D]
Arsenic	µg/L	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]	5[B]; 10[C]
Cadmium[3]	µg/L	2.4[A] / 0.17[B]; 7[C]	0.41[A] / 0.04[B]; 7[C]	2[A] / 0.15[B]; 7[C]	1[A] / 0.09[B]; 7[C]	7.7[A] / 0.37[B]; 7[C]	7.7[A] / 0.37[B]; 7[C]	1.7[A] / 0.13[B]; 7[C]	7.7[A] / 0.37[B]; 7[C]	0.63[A] / 0.06[B]; 7[C]	0.35[A] / 0.26[B]; 7[C]	0.89[A] / 0.08[B]; 7[C]	0.45[A] / 0.05[B]; 7[C]	1.3[A] / 0.11[B]; 7[C]	0.55[A] / 0.05[B]; 7[C]	2.2[A] / 0.17[B]; 7[C]
Copper[4]	µg/L	2.6[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2.31[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	4[B]; 2,000[C] / 1,000[D]	4[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	4[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	3.89[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2[B]; 2,000[C] / 1,000[D]	2.51[B]; 2,000[C] / 1,000[D]
Iron	µg/L	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]	300[BD]
Lead[5]	µg/L	3.68[B]; 5[C]	1[B]; 5[C]	3.06[B]; 5[C]	1[B]; 5[C]	7[B]; 5[C]	7[B]; 5[C]	2.4[B]; 5[C]	7[B]; 5[C]	1[B]; 5[C]	6.68[B]; 5[C]	1[B]; 5[C]	1[B]; 5[C]	1.82[B]; 5[C]	1[B]; 5[C]	3.47[B]; 5[C]
Manganese[6]	µg/L	510[A]; 120[C] / 20[D]	200[A]; 120[C] / 20[D]	450[A]; 120[C] / 20[D]	280[A]; 120[C] / 20[D]	1,200[A]; 120[C] / 20[D]	1,200[A]; 120[C] / 20[D]	450[A]; 120[C] / 20[D]	1,100[A]; 120[C] / 20[D]	280[A]; 120[C] / 20[D]	830[A]; 120[C] / 20[D]	280[A]; 120[C] / 20[D]	190[A]; 120[C] / 20[D]	460[A]; 120[C] / 20[D]	280[A]; 120[C] / 20[D]	670[A]; 120[C] / 20[D]
Nickel[7]	µg/L	104.17[B]	25[B]	93.46[B]	25[B]	150[B]	150[B]	80.82[B]	150[B]	25[B]	148.77[B]	25[B]	25[B]	68.57[B]	25[B]	100.62[B]
Nitrite (as N)	mg/L	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]	0.06[B]; 1[C]
pH	-	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]	6.5 to 9.0[B]; 7.5 to 10.5[D]
Selenium	µg/L	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]	1[B]; 50[C]
Thallium	µg/L	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]	0.8[B]

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Table 6.B.3 Summary of CWQG-FAL Exceedances of Surface Water Quality Data from 2019 Sampling Program (GEMTEC 2019)

Parameter	Units	Boundary Shaft				Ming Mine			South Brook Pond / South Brook							
		SW1	SW2	SW3	SW4	SW16	SW16A	SW18	SW5	SW6	SW7	SW8	SW9	SW10	SW11	SW17
Site Type[1]		Project Area	Project Area	Project Area	Project Area	Project Area	Project Area	Project Area	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Downstream South Brook	Upstream South Brook	Downstream South Brook
Zinc[8]	µg/L	126[A] / 84[B]; 5,000[D]	37[A] / 26[B]; 5,000[D]	112[A] / 73[B]; 5,000[D]	61[A] / 36[B]; 5,000[D]	574[A] / 206[B]; 5,000[D]	504[A] / 210[B]; 5,000[D]	122[A] / 92[B]; 5,000[D]	1,069[A] / 185[B]; 5,000[D]	41[A] / 23[B]; 5,000[D]	200[A] / 143[B]; 5,000[D]	60[A] / 37[B]; 5,000[D]	37[A] / 23[B]; 5,000[D]	96[A] / 62[B]; 5,000[D]	44[A] / 27[B]; 5,000[D]	138[A] / 87[B]; 5,000[D]

Notes:

Underlined – Concentration exceeds the CWQG-FAL Short-Term Guideline

Bold – Concentration exceeds the CWQG-FAL Long-Term Guideline

Underlined & Bold – Concentration exceeds both the CWQG-FAL Short-Term and Long-Term values

"-" parameter was not detected at a concentration greater than the laboratory reporting limit

[1] Site classified based on relation to the Project Area (Reference – upstream of Project activities and outside the influence of historical mining activities; Project Area – located within the proposed Project Area; Upstream South Brook – upstream of the Project Area and potentially influenced by historical mining activities; Downstream South Brook – downstream of the Project Area and potentially influenced by historical mining activities)

[2] Aluminum guideline varies depending on pH: 5 µg/L if pH < 6.5; 100 µg/L if pH ≥ 6.5

[3] Cadmium guideline is calculated using an equation based on water hardness: short-term guideline = $10^{\{1.016(\log[\text{hardness}])-1.71\}}$; long-term guideline = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$

[4] Copper guideline is calculated using an equation based on water hardness: long-term guideline = $0.2 * e^{\{0.8545[\ln(\text{hardness})-1.465\}}$

[5] Lead guideline is calculated using an equation based on water hardness: long-term guideline = $e^{\{1.273[\ln(\text{hardness})]-4.705}$

[6] Manganese guideline is calculated using an equation based on water hardness: short-term guideline = $\exp(0.878[\ln(\text{hardness})]+4.76$

[7] Nickel guideline is calculated using an equation based on water hardness: long-term guideline = $e^{\{0.76[\ln(\text{hardness})]+1.06\}}$

[8] Zinc guideline is calculated using an equation based on dissolved organic carbon, pH, and water hardness: short-term guideline = $\exp(0.833[\ln(\text{hardness})]+0.240[\ln(\text{DOC})]+0.526$; long-term guideline = $\exp(0.947[\ln(\text{hardness})]-0.815[\text{pH}]+0.398[\ln(\text{DOC})]+4.625)$

[A] CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Short-Term Guideline

[B] CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life, Long-Term Guideline

[C] Health Canada Guidelines for Canadian Drinking Water Quality, Maximum Acceptable Concentration

[D] Health Canada Guidelines for Canadian Drinking Water Quality, Aesthetic Objective or Operational Guidance Value

6.B.1.3.1 Reference Sites

None of the surface water features that were sampled for the GEMTEC (2019) sampling program were classified as Reference sites.

6.B.1.3.2 Project Area Sites

Seven surface water features from the Boundary Shaft and Ming Mine areas were classified as Project Area sites. These include SW1, SW2, SW3, and SW4 from the Boundary Shaft area and SW16, SW16A, and SW18 from the Ming Mine area (Figure 6.B.1). These sites reported CWQG-FAL exceedances of the following parameters:

- Total Aluminum – ranging from 154 µg/L (SW2) to 11,000 µg/L (SW1)
- Total Arsenic – ranging from 16 µg/L (SW3) to 90 µg/L (SW1)
- Total Cadmium – ranging from 4.59 µg/L (SW4) to 95.2 µg/L (SW16)
- Total Copper – ranging from 9 µg/L (SW2) to 12,000 µg/L (SW1)
- Total Iron – ranging from 476 µg/L (SW18) to 73,800 µg/L (SW1)
- Total Lead – ranging from 3 µg/L (SW4) to 10.6 µg/L (SW16A)
- Total Manganese – ranging from 146 µg/L (SW2) to 4,830 µg/L (SW16A)
- Nitrite (as N) – 0.1 mg/L reported at SW16A
- Total Selenium – ranging from 2 µg/L (SW1) to 10 µg/L (SW16 and SW16A)
- Total Thallium – ranging from 1.3 µg/L (SW16) to 1.4 µg/L (SW16A)
- Total Zinc – ranging from 885 µg/L (SW4) to 21,100 µg/L (SW16)

Of the seven Project Area sites sampled, SW1 and SW16/16A generally reported the highest concentrations of the analyzed parameters. These sites are both located in close proximity to historical mine workings. SW1 is located adjacent to the Boundary Shaft, and SW16/16A is located adjacent to Ming Mine (Figure 6.B.1). Overall, based on the results presented in Table 6.B.3, the Boundary Shaft and Ming Mine sites' water quality within the Project Area are considered to be influenced by historical mining activities.

Except for total nickel, nitrite (as N), and total selenium, the parameters listed above also reported exceedances of applicable GCDWQ guidelines.

6.B.1.3.3 Upstream South Brook Sites

One of the surface water features from the South Brook area was classified as an Upstream South Brook site – SW11. This site reported CWQG-FAL exceedances of total aluminum (751 µg/L), total cadmium (0.94 µg/L), total copper (176 µg/L), total iron (2,340 µg/L), total lead (3.3 µg/L), pH (4.02), and total zinc (260 µg/L). Values reported for total aluminum, total iron, total manganese, and pH also reported exceedances of applicable GCDWQ guidelines. SW11 is located along the portion of South Brook that crosses Highway 414, to the west of the Project Area, which is downstream of the Historical Tailings Area. Based on the elevated metals concentrations and acidic pH values, SW11 water quality is considered to be influenced by historical mining activities.

6.B.1.3.4 Downstream South Brook Sites

Eight surface water features from the South Brook Pond (P01) and South Brook areas were classified as Downstream South Brook sites. These include SW5, SW6, SW7, SW8, SW9, SW10, SW11, and SW17 (Figure 6.B.1). These sites reported CWQG-FAL exceedances of the following parameters:

- Total Aluminum – ranging from 104 µg/L (SW17) to 4,570 µg/L (SW5)
- Total Arsenic – 181 µg/L reported at SW5
- Total Cadmium – ranging from 0.63 µg/L (SW9) to 73.7 µg/L (SW5)
- Total Copper – ranging from 33 µg/L (SW17) to 6,210 µg/L (SW5)
- Total Iron – ranging from 602 µg/L (SW6) to 20,600 µg/L (SW5)
- Total Lead – ranging from 1.2 µg/L (SW10) to 24.8 µg/L (SW5)
- Total Manganese – ranging from 204 µg/L (SW9) to 4,540 µg/L (SW5)
- Total Nickel – 65 µg/L reported at SW6
- Nitrite (as N) – 0.09 mg/L reported at SW5
- Total Selenium – ranging from 2 µg/L (SW7) to 16 µg/L (SW5)
- Total Zinc – ranging from 139 µg/L (SW17) to 11,300 µg/L (SW5)

Of the eight Downstream South Brook sites samples, SW5 generally reported the highest concentrations of the analyzed parameters. This site is located downstream of the effluent discharge outlet but before the inlet to South Brook Pond (Figure 6.B.1). Overall, based on the results presented in Table 6.B.3, the Downstream South Brook site water quality is considered to be influenced by historical mining activities.

Except for total nickel, nitrite (as N), total selenium, and total thallium, the parameters listed above also reported exceedances of applicable GCDWQ guidelines.

6.B.1.4 Environmental Effects Monitoring Studies (Stantec 2013; 2019; 2023)

Between 2011 and 2021, water samples were collected from South Brook Pond and Scrape Pond four times per year (Stantec 2013; 2019; 2023), in accordance with Schedule 5 of the MDMER (formerly Schedule 7). Specific locations within the ponds that were sampled are not presented in Figure 6.B.1. For the Phase I EEM study (Stantec 2013), South Brook Pond and Scrape Pond were sampled in March 2011, June 2012, September 2012 and October 2012. For the Phase II EEM study (Stantec 2019), South Brook Pond and Scrape Pond were sampled in February 2016, May 2016, August 2016, and November 2016. For the Phase III EEM study (Stantec 2023), South Brook Pond and Scrape Pond were sampled in February 2019, April 2019, July 2019, and October 2019. Samples were analyzed for general chemistry, total metals, strong acid dissociable cyanide, and radium-226.

Table 6.B.4 summarize the surface water quality statistics of the EEM studies between 2011 and 2021. Parameters were selected based on parameters listed in Table 2, Schedule 4 of MDMER Table 6.B.4 and observed exceedances of the CWQG-FAL values (Table 6.B.4).

Table 6.B.4 Summary of MDMER Surface Water Quality Statistics from Phase I, Phase II, and Phase III Environmental Effects Monitoring (Stantec 2013; 2019; 2023)

Parameter	Units	Number of Sampling Events	Guidelines	Number of MDMER Exceedances	South Brook Pond Site Type[1]: Downstream South Brook			Scrape Site Type[1]: Reference		
					Minimum	Maximum	Median	Minimum	Maximum	Median
Total Arsenic	mg/L	28	0.10[A]; 0.01[B]	SBP 0, SP 0	<0.001	0.00555	0.0018	<0.0002	0.004	0.00025
Total Copper	mg/L	28	0.10[A]; 2[B] / 1[C]	SBP 7, SP 0	0.0055	**9.73**	0.094	<0.002	0.0096	0.002
SAD Cyanide	mg/L	26	0.50[A]; 0.2[B]	SBP 0, SP 0	<0.001	0.007	0.0014	<0.001	0.002	0.0016
pH, Lab	-	28	6.0 to 9.5[A]; 7.5 to 10.5[C]	SBP 18, SP 1	**2.74**	7.16	**5.79**	**5.89**	9.22	7.15
Total Lead	mg/L	28	0.08[A]; 0.005[B]	SBP 0, SP 0	<0.0005	0.0315	0.0018	<0.00001	0.0133	0.00091
Total Nickel	mg/L	28	0.25[A]	SBP 0, SP 0	<0.002	0.054	0.0033	<0.002	0.005	0.00037
Total Zinc	mg/L	28	0.40[A]; 5[C]	SBP 9, SP 0	<0.005	**12.5**	0.20	<0.00233	0.0173	0.0083
TSS	mg/L	28	15[A]	SBP 6, SP 0	<1	**22**	4.45	<1	9.2	1.7
Radium-226	Bq/L	28	0.37[A]; 0.5[B]	SBP 0, SP 0	<0.005	0.04	0.006	<0.005	0.02	0.007

Notes:

Bold – Concentration exceeds MDMER Schedule 4, Table 2 Maximum Authorized Monthly Mean Concentration guideline

SAD – strong acid dissociable

TSS – total suspended solids

Bq/L – becquerel per litre

[1] Site classified based on relation to the Project Area (Reference – upstream of Project activities and outside the influence of historical mining activities; Project Area – located within the proposed Project Area; Upstream South Brook – upstream of the Project Area and potentially influenced by historical mining activities; Downstream South Brook – downstream of the Project Area and potentially influenced by historical mining activities)

[A] MDMER Schedule 4, Table 2 Maximum Authorized Monthly Mean Concentration guideline

[B] Health Canada Guidelines for Canadian Drinking Water Quality, Maximum Acceptable Concentration

[C] Health Canada Guidelines for Canadian Drinking Water Quality, Aesthetic Objective or Operational Guidance Value

6.B.1.4.1 Reference Sites

One of the ponds sampled for the Phase I, Phase II, and Phase III EEM studies (Stantec 2013, 2019, 2023) was classified as a Reference site – Scrape Pond. Scrape Pond is located west of Highway 418, approximately 2,000 m north of the FDP (Figure 6.B.1).

Based on results presented in and, Scrape Pond reported a laboratory pH of 5.89 in October 2021, which is below the MDMER and CWQG-FAL lower limit of 6.5. This was the only noted exceedance of the MDMER criteria and/or CWQG-FAL values for Scrape Pond. Laboratory pH values can deviate substantially from field pH measurement values and cannot be used to confirm regulatory compliance. Therefore, Scrape Pond is considered to be unaffected by historical mining activities.

When comparing to GCDWQ guidelines, the Scrape Pond parameters presented in Table 6.B.3 and Table 6.B.4 also reported exceedances of pH and total lead.

6.B.1.4.2 Project Area Sites

None of the surface water features that were sampled for the Phase I, Phase II, and Phase III EEM studies were classified as Project Area sites.

6.B.1.4.3 Upstream South Brook Sites

None of the surface water features that were sampled for the Phase I, Phase II, and Phase III EEM studies were classified as Upstream South Brook sites.

6.B.1.4.4 Downstream South Brook Sites

One of the ponds sampled for the Phase I, Phase II, and Phase III EEM studies (Stantec 2013, 2019, 2023) was classified as a Downstream South Brook site – South Brook Pond. South Brook Pond is located approximately 400 m west of Highway 418, just downstream of the historical and proposed FDP (Figure 6.B.1).

Based on the results presented in, South Brook Pond reported a total of seven exceedances of total copper, nine exceedances of total zinc, six exceedances of total suspended solids, and 18 pH values that were reported below the MDMER lower limit criteria. The total copper exceedances ranged from 0.397 to 9.73 mg/L; total zinc exceedances ranged from 0.683 to 12.5 mg/L; total suspended solids exceedances ranged from 16 to 22 mg/L; and pH exceedances ranged from 2.74 to 5.98. Based on the elevated total metals and acidic pH values, South Brook Pond is considered to be influenced by historical mining activities.

When comparing to GCDWQ guidelines, the South Brook Pond parameters presented in Table 6.B.3 and Table 6.B.4 also reported exceedances of total copper, pH, total lead, and total zinc.

6.B.2 References

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Appendix 6.C South Brook Pond Assimilative Capacity Assessment

Stantec

Memo

To:	Tabatha LeBlanc FireFly Metals Canada	From:	Mahyar Shafii, Igor Iskra Stantec Consulting Ltd.
Project/File:	121418199	Date:	April 15, 2025

Reference: Green Bay Ming Mine Project - South Brook Pond Assimilative Capacity Assessment

1 Introduction

FireFly Metals (FireFly) is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of the existing approved underground Ming Mine. The Project, which is located on the Baie Verte peninsula in the province of Newfoundland and Labrador, comprises the extension of underground mine works, an increase in the annual production rate, and the construction of a new process plant and tailings management facility (TMF) adjacent to the mine. The Project plans to discharge treated effluent from a wastewater management plant (WWMP) via a pipeline outlet to South Brook Pond, which is a waterbody located along the main stem of South Brook. South Brook eventually empties into Baie Verte. The location of the pipeline outlet is the same final discharge point (FDP) for the existing approved underground mine (Stantec 2023).

The Environmental Registration completed for the Project includes an assessment of potential environmental effects on surface water quality and quantity (FireFly 2025). This memo provides the results of an assimilative capacity (AC) study of the receiving waters downstream of the treated effluent discharge point.

In this AC study, mass balance analyses are used to quantify water quality changes within the receiving waters and determine the extents of the mixing zone in South Brook Pond and in the South Brook channel downstream. The AC study considers two scenarios including high-flow and average operation conditions in average and high-flow discharge conditions, respectively, which are represented by the following:

Both:

- The Ecometrix (2024) data (90th percentile concentrations) were used in the AC study to describe effluent quality prior to treatment
- Parameters of potential concern (PoPCs) in discharge at maximum effluent criteria values, including maximum average monthly regulatory criteria concentrations (e.g., Metal and Diamond Mine Effluent Regulations (MDMER))
- 75th percentile concentrations for PoPCs in the immediate receiver (South Brook Pond) and inflows from sub-watersheds downstream of South Brook Pond

High-flow operation:

- Maximum discharge flow rate at FDP
- 80th percentile flows in receivers (sub-watersheds delineated within the South Brook watershed)

Average operation:

- Average discharge flow rate at FDP
- Mean annual flow (MAF) rate in the receiver

The rationale for considering two discharge rate scenarios is that mine effluent discharge being largely from open sources such as the TMF, waste rock stockpiles and process plant area reflects natural climate-driven flow regimes, as it is influenced by environmental conditions such as precipitation, snowmelt, and seasonal variability. The TMF, polishing pond, and catch basins that send overflow to the WWMP are open to the environment and would have higher storage volumes and flows during precipitation and snowmelt events, and reduced flow during dry periods, changing the discharge rate from the WWMP.

The main objective in this AC study is to determine the extent of the mixing zone in the two scenarios (high-flow and average based on the resulting concentrations when effluent and receiver flows are fully mixed within South Brook Pond and further downstream when concentrations return to baseline or regulatory guideline conditions. Effluent quality limits and objectives are derived based on the outcome of the AC study and MDMER criteria.

The Canadian Council of Ministers of the Environment (CCME) defines the mixing zone, also referred to as the initial dilution zone, as, “the area contiguous with a point source (effluent) where the effluent mixes with ambient water and where concentrations of some substances may not comply with water quality guidelines or objectives” (CCME 2003). The Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG-FAL) (CCME 2003) is used as water quality guidelines, indicating that the end of mixing zones is where concentrations return to CWQG-FAL values. However, in the context of the AC study, for parameters with the 75th percentile background concentration higher than CWQG-FAL values, background quality is used to identify the extent of mixing zones. For such parameters, because background conditions already reflect natural geochemical characteristics and impacts of historical mining activities, comparisons against background levels provide a more realistic evaluation of environmental effects. This approach accounts for site-specific conditions as opposed to relying solely on generic guideline values.

1.1 Background

The Project Area is located on the Baie Verte Peninsula on the northern coast of the Island of Newfoundland, primarily encompassing parts of the South Brook, with the freshwater intake located in Trimms Brook watersheds (FireFly 2025). South Brook and South Brook Pond are impacted by historical mining activities, pre-dating the Ming Mine operation. The Project is an expansion of an existing and approved operation and infrastructure. The Ming Mine was in production from 2011 to 2023. Existing components and activities that will require modification, as well as new components and activities are within the scope of the Environmental Registration. These include underground mining works (e.g., expanding underground workings), processing and mine waste management (e.g., TMF and tailings management) and supporting infrastructure (e.g., site roads), as detailed in FireFly (2025).

Baseline studies began in 1995 (Firefly 2025) with Environmental Effects Monitoring (EEM) studies ongoing since the start of production in 2011. The Ming Mine Phase 4 EEM study (Stantec 2023) was conducted for the previously operating Ming Mine in support of EEM requirements in the MDMER. The Phase 4 EEM study included a mixing zone assessment, which presented receiving water quality data at the outflow of South Brook at South Brook Pond (Figure 6.C.1; Attachment A), referred to as EEM-A in the AC study. Water quality sampling in the EEM study was conducted between October 25-28, 2021. Field measured parameters (pH and temperature), general chemistry parameters (hardness, nitrate as nitrogen, total ammonia as nitrogen, and total phosphorus), and total metals from the EEM water quality dataset were used in the AC study.

A baseline surface water quantity and quality monitoring field program was conducted in 2024 to support Project development. The South Brook watershed was further delineated into 27 sub-watersheds as presented in Figure 6.C.1 (Attachment A). Sub-watersheds were used in this AC study to estimate flows in South Brook and its tributaries. The MAF results of the regional and local hydrological assessment (FireFly

2025) were used to estimate average flows at sub-watershed outlets to quantify discharge. In addition, regional hydrology assessment flow statistics were used to estimate the 80th percentile discharge flow rate for each sub-watershed.

In 2024, surface water quality was monitored at 13 stations with 10 stations on watercourses (SW-1 to SW-4; SW-7 to SW-9; SW-11 to SW-13) and 3 on waterbodies (SW-5, SW-6 and SW-10) (Figure 6.C.1, Attachment A). Six monitoring events were conducted with water samples collected and sent for laboratory analysis and *in situ* water quality measurements taken between May and December 2024. A number of monitoring sites (including SW-1, SW-2, SW-4, SW-8, SW-11, and SW-13) were grouped as reference watercourse sites that were not influenced by historical mining activities. The 2024 surface water quality data were used in the AC study to determine PoPC concentrations in South Brook, unnamed tributaries within the Project Area, including those historically impacted by mining activities (e.g., Boundary Shaft), its headwaters and the unnamed watercourses flowing into South Brook downstream of the FDP. Historical mining activities have increased concentrations of several parameters in South Brook, South Brook Pond and the impacted tributaries (e.g., total copper, total lead, total zinc, total cadmium).

In 2024, Ecometrix conducted a preliminary evaluation of the expected influent water quality to be received by the proposed Project WWMP (Ecometrix 2024). The study characterized representative water quality by the combined contributions of various potential source areas on the Project site, including the TMF, underground workings, and surface water collected from the proposed mill site including runoff and seepage from waste rock piles located at the legacy site Boundary Shaft. Assuming full mixing of waters coming from these three source areas, the study presented the median and 90th percentile concentrations associated with the representative effluent (Ecometrix 2024). The Ecometrix (2025) data (90th percentile concentrations) were used in the AC study to describe effluent quality prior to treatment.

2 Methods

2.1 Parameters of Potential Concern & Effluent Quality

The 90th percentile raw water quality concentrations presented in Ecometrix (2024) were compared with CWQG-FAL values to identify the PoPCs. These parameters included MDMER parameters (total arsenic, total copper, total lead, total nickel, and total zinc) and non-MDMER parameters (total aluminum, total cadmium, total chromium, total iron, total manganese, nitrate as nitrogen, total phosphorus, total selenium, total silver, and total thallium) (Table 1). For total chromium, there is no CWQG-FAL value although the CWQG-FAL guideline presents values for chromium oxidation states +3 (trivalent; III) and +6 (hexavalent, VI). In this AC study, total chromium concentrations are assessed in comparison to the hexavalent guideline value (1 µg/L) as it is the lower of the two guideline values. Other MDMER parameters (suspended solids and un-ionized ammonia) were not identified by the PoPC analysis as PoPCs. As particulate matter may be in the effluent, suspended solids were included as a PoPC. Similar to suspended solids, unionized ammonia as nitrogen and pH were also assessed as part of the AC study as nitrogen-based explosives will potentially be used by the project. Unionized ammonia, as the toxic form of ammonia, could be harmful to aquatic life and pH is a key indicator of the acid-base balance of the water influencing the toxicity of many contaminants. Unionized ammonia concentration is calculated based on the total ammonia concentration, water temperature and pH. At lower temperature and pH, a smaller proportion of total ammonia exists in the unionized form. As per MDMER, the maximum monthly mean concentration of MDMER parameters for existing mines presented in Table 1 cannot exceed the MDMER values (Table 2 of Schedule 4 of MDMER). In addition, the pH of the effluent has to be between 6.0 and 9.5 and the effluent shall not be acutely lethal. These criteria were considered in the AC study as effluent discharge criteria to assess mixing in the receiving waters. Radium 226 is the only MDMER parameter not included in the AC study as it is typically associated with uranium mining and milling and the raw water quality 90th percentile concentration

(0.0065 Bq/L) was 56 times lower than the MDMER maximum monthly mean value of 0.37 Bq/L, which does not identify it as a PoPC.

Effluent quality for MDMER PoPCs, identified in the raw effluent as well as suspended solids, was derived from the maximum mean monthly concentrations, except for lead where the concentration of 13 μg/L was used in the assessment of the corresponding mixing zone (Table 1). The total lead concentration of 13 μg/L was the 90th percentile concentration associated to untreated effluent as per Ecometrix (2024). As such, it was assumed that the maximum mean monthly concentration of total lead cannot be higher than 13 μg/L, and that concentration was used as the worst case in the AC study. Similar effluent quality was used in both average and high-flow scenarios.

For non-MDMER PoPCs, the following concentrations were used for the AC study (Table 1):

- the concentration equal to 10 times CWQG-FAL values or treatment criteria, whichever was higher, for other non-MDMER parameters (total phosphorus, total aluminum, total cadmium, total chromium, total iron, nitrate as nitrogen, total selenium, total silver and total thallium)
- 90th percentile raw effluent quality concentration of 2,350 μg/L (presented in column five in Table 1) for the total manganese effluent quality

Reference: **Green Bay Ming Mine Project - South Brook Pond Assimilative Capacity Assessment**

Table 1 Study Parameters including Parameters of Potential Concern (PoPCs)

Parameter *	Unit	MDMER (Maximum Monthly Mean Concentration)	CWQG-FAL	Modelled Effluent Quality	Effluent Quality Source
Arsenic, Total	µg/L	300	5	300	MDMER Maximum Monthly Mean Concentration
Copper, Total	µg/L	300	2 [1]	300	MDMER Maximum Monthly Mean Concentration
Cyanide, Total	µg/L	500	n/a [2]	500	MDMER Maximum Monthly Mean Concentration
Lead, Total	µg/L	100	1[3]	13.0	Treatment System Maximum Mean Monthly Criteria
Nickel, Total	µg/L	500	25 [4]	500	MDMER Maximum Monthly Mean Concentration
Zinc, Total [#]	µg/L	500	64 [5]	500	MDMER Maximum Monthly Mean Concentration
Total Suspended Solids [Ω]	mg/L	15	15 [11]	15	MDMER Maximum Monthly Mean Concentration
Unionized Ammonia as N (Calculated [φ]) [Ω]	mg/L	0.5	0.016	0.5	MDMER Maximum Monthly Mean Concentration
pH, Field [Ω]	S.U.	6.00 – 9.50	6.50 – 9.00	6.51	MDMER Maximum Monthly Mean Concentration
Aluminum, Total [#]	µg/L	-	100 [6]	1,000	10x CWQG-FAL value
Total Ammonia as Nitrogen [Ω]	mg/L	-	39.60 [7]	5.10	MDMER Maximum Monthly Mean Concentration
Cadmium, Total	µg/L	-	0.09 [8]	5.00	Treatment System Maximum Mean Monthly Criteria
Chromium, Total [ψ]	µg/L	-	1.0	15.0	Treatment System Maximum Mean Monthly Criteria
Iron, Total	µg/L	-	300	3,000	10x CWQG-FAL value
Manganese, Total [#]	µg/L	-	190 [9]	2,350	90th percentile raw water quality concentration
Nitrate as N	mg/L	-	3.00	30	10x CWQG-FAL value
Phosphorus, Total	mg/L	-	0.020 [10]	0.2	10x CWQG-FAL value
Selenium, Total	µg/L	-	1.0	20	Treatment System Maximum Mean Monthly Criteria
Silver, Total	µg/L	-	0.25	2.5	10x CWQG-FAL value
Thallium, Total	µg/L	-	0.8	8	10x CWQG-FAL value

Notes:

* PoPCs are shown in bold. PoPCs are for both average and high-flow scenarios.

[#] Concentrations are compared with the guideline value for dissolved.

[ψ] Total chromium was compared with the CWQG-FAL value for the hexavalent (VI) state (1 µg/L), which is the smaller of the guideline values for the trivalent and hexavalent states. There is no CWQG-FAL value for total chromium.

[Ω] Concentration in untreated effluent does not exceed CWQG-FAL. However, the parameter was considered as PoPC to get insight into the extent of the corresponding mixing zone.

[φ] Calculated as a proportion of total ammonia as nitrogen depending on water temperature and pH. At lower pH and temperature, a smaller proportion of total ammonia exists in the unionized form.

[1] 2 µg/L if hardness is <82 mg CaCO3·L^{-1}, 0.2×exp{0.8545×[ln(hardness)]-1.465} if hardness ≥82 to ≤180 mg Ca CO3·L^{-1}, and 4 µg/L if hardness >180 mg CaCO3·L^{-1}.

[2] CWQG-FAL value of free cyanide is 5 µg/L, which is not applicable to total cyanide.

[3] 1 µg/L if hardness is <60 mg CaCO3·L^{-1}, exp{1.273×[ln(hardness)]-4.705 } if hardness ≥60 to ≤180 mg CaCO3·L^{-1}, 7 µg/L if hardness >180 mg CaCO3·L^{-1}.

[4] 25 µg/L if hardness ≤60 mg CaCO3·L^{-1}, exp{0.76×[ln(hardness)]+1.06} if hardness >60 to ≤180 mg CaCO3·L^{-1}, and 150 µg/L if hardness >180 mg CaCO3·L^{-1}.

[5] Calculated for dissolved zinc using the equation exp(0.947×[ln(hardness mg·L^{-1})]-0.815×[pH]+0.398×[ln(DOC mg·L^{-1})]+4.625) for hardness 23.4 and 399 mg CaCO3·L^{-1}, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L^{-1} where DOC is dissolved organic carbon set at 0.5 mg/L.

[6] 5 µg/L if pH <6.5, 100 µg/L if pH ≥6.5.

[7] Function of pH and temperature. Values used to determine CWQG-FAL are for the mix of effluent and receiver waters.

[8] 0.04 µg/L if hardness is <17 mg CaCO3·L^{-1}, 10×{0.83×(log[hardness])–2.46} if hardness ≥17 to ≤280 mg CaCO3·L^{-1}, 0.37 µg/L if hardness >280 mg CaCO3·L^{-1}.

[9] CWQG-FAL calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese (CCME 2000).

[10] Trigger Ranges; see Guidance Framework for Phosphorus factsheet (CCME 2004): ultra-oligotrophic <0.004 mg/L, oligotrophic 0.004-0.01 mg/L, mesotrophic 0.01-0.02 mg/L, meso-eutrophic 0.02-0.035 mg/L, eutrophic 0.035-0.1 mg/L, hyper-eutrophic >0.1 mg/L. Receiving environment is assumed to be mesotrophic.

[11] Maximum average increase of 5 mg/L from background levels for longer term exposures (e.g., inputs lasting between 24 h and 30 d).

2.2 Receiving Environment

Post-development MAF associated with individual sub-watersheds within the larger South Brook watershed were calculated as part of the regional hydrology assessment in Chapter 6.3 of the Registration (FireFly 2025) (Table 2). The MAF values were used to represent flow at each sub-watershed outlet in the AC study of the average scenario. The 80th percentile flow, used in the high-flow scenario, was calculated for each sub-watershed (Table 2), illustrated on Figure 6.C.1, based on a regional hydrology assessment considering seven watersheds selected based on the outcome of the homogeneity test, as described in Section 6.3 of the Registration (FireFly 2025).

Table 2 Sub-watershed Areas, Mean Annual and 80th Percentile Flows and Associated Water Quality Monitoring Stations

Sub-watershed	Post-Development Catchment Area (km^2)	Post-Development MAF (m^3/s)	Post-Development 80th Percentile (m^3/s)	Associated Water Quality Monitoring Stations
SB12	98.12	2.695	3.716	SW-9, EEM-A
SB13	0.06	0.001	0.002	
SB14	0.82	0.021	0.026	SW-3
SB15	2.67	0.068	0.089	SW-4
SB16	3.56	0.092	0.120	Reference [1]
SB17	104.18	2.865	3.954	
SB20	106.82	2.939	4.057	
SB21	108.94	2.998	4.141	
SB23	117.70	3.244	4.485	

Note:
[1] Reference riverine quality as presented in surface water study (Chapter 6.3 of Stantec (2025))

Sub-watershed outlet water quality was set at 75th percentile parameter concentration values based on water quality data monitored in 2024 (FireFly 2025) and the Phase 4 EEM report (Stantec 2023). Water quality data at surface water monitoring station SW-9 (six samples) and water quality data from EEM-A (one sample) were used for the calculation of 75th percentile concentrations of flow into South Brook Pond from South Brook (Attachment A). The upstream area of SB-12 and SB-13 that drain to South Brook Pond cover approximately 38% of the total South Brook watershed.

Sub-watershed SB-16 and its upstream sub-watersheds SB-14 and SB-15, drain into South Brook Pond via an unnamed watercourse. SB-14 includes historic mining activities such as the Boundary Shaft. SB-15 has a named waterbody located within it, Three Boulder Pond. The 2024 surface water quality monitoring program included six sampling events at SW-3 (located in SB-14) and SW-4 (located in SB-15). The combination of waters drained from sub-watersheds SB-14 and SB-15 (i.e., flow-weighted mixing of SW-3 and SW-4 concentration results) and from SB-16 flows at the pourpoint of SB-16 into South Brook Pond. The quality of SB-16 was set at 75th percentile concentrations at reference stations. Therefore, the flow-weighted combination of 75th percentile concentrations at SW-3, SW-4 and reference stations (for SB-16) were used to represent the quality of water draining into South Brook Pond at the outflow of SB-16.

For sub-watersheds located downstream of South Brook Pond, including tributaries to South Brook, quality was represented by 75th percentile reference data described in Section 1.1 of this memo. Table 2 provides information about surface water quantity and quality at individual sub-watersheds in the downstream receiver. Attachment B presents 75th percentile concentrations used in the AC study including those at SW3, SW4, flow-weighted mix of SW-3 and SW-4 (for water flowing into SB-16), SW-9 and reference stations (used for SB-16 and sub-watersheds downstream of South Brook Pond).

2.3 Effluent Quantity

The maximum FDP discharge rate for the WWMP is 200 m^3/hr (0.056 m^3/s). This value represents the worst case for the discharge capacity of the WWMP and was used in the high-flow AC scenario. The expected average FDP discharge of 128 m^3/hr (0.036 m^3/s) was used in the average AC scenario.

2.4 Mixing Zone Assessment

Complete mixing of the FDP discharge and local receiver water was assumed to occur within South Brook Pond and the edge of full mixing (EFM) was considered to be the outflow from South Brook Pond. A mass balance assessment was used for the two flow scenarios (average, high-flow) to determine the concentrations of PoPCs at the outflow from South Brook Pond and further downstream at the outlet of sub-watersheds along South Brook, down to the outflow into Baie Verte. Sub-watersheds SB-17, SB-20, SB-21 and SB-23 represent sub-watershed outlets downstream of South Brook Pond on the South Brook main channel and identified as P1 to P4, respectively. The concentrations and flows at each point were incorporated into mass balance calculations (Table 3). Discharge at the EFM was estimated as the sum of SB-1 through SB-16 sub-watershed flows using MAF in the average scenario and 80th percentile discharge in the high-flow scenario. Water quality at the EFM was calculated as a flow-weighted average between SB-12, SB-13 and SB-16 and the FDP discharge (Table 2). Using a similar approach, discharge and concentrations were calculated at the P1 to P4 downstream points on the South Brook main channel (Figure 6.C.1, Attachment A).

Table 3 Location of Points of Presenting Mass Balance Analysis Results

Point	Description	Total Watershed Area (km^2)	Distance to FDP along watercourse (km)	Contributing Terms
EFM *	Edge of Full Mixing in South Brook Pond	101.8 Ψ	1.03	SB-1 through SB-16 and FDP
P1	Pourpoint of SB-17	104.2	2.65	EFM, SB-17
P2	Pourpoint of SB-20	106.8	3.39	P1, SB-19, SB-20
P3	Pourpoint of SB-21	108.9	5.21	P2, SB-18, SB-21
P4	Pourpoint of SB-23	117.7	6.96	P3, SB-22, SB-23

Notes:
* Edge of Full Mixing
Ψ Sum of drainage areas of sub-watersheds upstream of South Brook Pond, this includes the upstream subwatersheds of South Brook not shown in Fig 6.C.1. The total South Brook watershed is117.7 sq km. The mixing area within South Brook Pond was not included.

Baseline conditions were incorporated into the mass balance calculations. Baseline water quality and quantity were based on the flow-weighted contributions from SB-12, SB-13, SB-16, excluding the FDP discharge. A number of the PoPC baseline concentrations in South Brook Pond exceeded CWQG-FAL values. The end of the mixing zone for a given parameter was determined based on the mass balance calculated concentration. If the baseline concentration was lower than the CWQG-FAL value, then the edge of mixing zone for that parameter was defined by the CWQG-FAL value. However, when the baseline concentration was higher than the CWQG-FAL value, the end of the mixing zone was defined by the baseline value.

3 Results and Discussion

3.1 Average Scenario

Table 4 provides concentrations calculated using the mass balance approach described in Section 2.4 for MDMER and non-MDMER PoPCs at the EFM and at the P1 to P4 outlets of the downstream South Brook sub-watersheds. Highlighted cells in Table 4 indicate that concentrations were either lower than the CWQG-FAL value (when the baseline 75th percentile concentration was lower than the CWQG-FAL value) or lower than baseline (when baseline was higher than the CWQG-FAL value) representing the extent of the mixing zone for that parameter.

Table 4 Average Scenario Mass Balance Analysis Results

Parameter	Unit	CWQG -FAL	FDP	Baseline	EFM	P1	P2	P3	P4
Distance From FDP (km)					1.03	2.65	3.38	5.21	6.96
MDMER									
Arsenic, Total *	µg/L	5	300	2	5	5	5	5	5
Copper, Total *	µg/L	2	300	219	220	214	209	205	189
Cyanide, Total *	mg/L	#	0.500	0.000	0.006	0.006	0.006	0.006	0.005#
Lead, Total *	µg/L	1.0	13.0	2.1	2.2	2.2	2.1	2.1	2.0
Nickel, Total *	µg/L	25	500	4	10	10	9	9	9
Zinc, Total *	µg/L	A	500	184	188	183	179	175	163
Total Suspended Solids	mg/L	15	15	10	10	10	10	9	9
Unionized Ammonia as N (Calculated φ)	mg/L	0.016	0.5	1.4E-07	7.9E-07	8.9E-07	9.9E-07	1.1E-06	1.5E-06
pH, Field	S.U.	6.5-9	6.51	4.48	4.51	4.57	4.63	4.68	4.84
Non-MDMER									
Aluminum, Total	µg/L	B	1,000	623	628	617	608	600	572
Ammonia as N, Total	mg/L	Variable	5.100	0.015	0.079	0.077	0.075	0.074	0.070
Cadmium, Total	µg/L	C	5.00	0.58	0.64	0.62	0.61	0.60	0.56

Table 4 Average Scenario Mass Balance Analysis Results

Parameter	Unit	CWQG-FAL	FDP	Baseline	EFM	P1	P2	P3	P4
Distance From FDP (km)					1.03	2.65	3.38	5.21	6.96
Chromium, Total	µg/L	1.0 [D]	17.0	1.6	1.7	1.7	1.7	1.7	1.6
Iron, Total	µg/L	300	3,000	3,292	3,289	3,214	3,145	3,092	2,893
Manganese, Total	µg/L	[E]	2,350	224	251	245	240	236	221
Nitrate-N	mg/L	3.00	30.00	0.03	0.40	0.39	0.38	0.38	0.35
Phosphorus, Total	mg/L	0.020 [F]	0.200	0.018	0.021	0.020	0.020	0.020	0.020
Selenium, Total	µg/L	1.0	20.0	0.3	0.5	0.5	0.5	0.5	0.5
Silver, Total	µg/L	0.25	2.50	0.05	0.08	0.08	0.08	0.08	0.08
Thallium, Total	µg/L	0.8	8.0	0.1	0.2	0.1	0.1	0.1	0.1

Notes:
- * MDMER parameter
- \# The CWQG-FAL value (0.005 mg/L) is for free cyanide and not applicable to total cyanide. Total cyanide includes the following dissolved species: free cyanide, weak metal cyanide complexes and strong metal cyanide complexes. Comparison between mass balance concentrations and the CWQG-FAL guideline was conducted under the assumption that total cyanide is not fully in the free cyanide forms. The free cyanide concentration at P4 is expected to be not greater than 0.005 mg/L based on the predicted total cyanide concentration.
- φ Calculated as a proportion of total ammonia depending on water temperature and pH. At lower pH and temperature, a smaller proportion of total ammonia exists in the unionized form.
- A Ranges between 64 and 370 µg/L
- B Ranges between 5 and 100 µg/L
- C Ranges between 0.05 and 0.09 µg/L
- D CWQG-FAL is for chromium VI, which is the lower value between CWQG-FAL values for chromium III and VI. Total chromium values were compared against the guideline value for chromium VI.
- E Ranges between 190 and 290 µg/L
- F Application of upper value of mesotrophic range (20 µg/L) as guideline limit to reduce likelihood of the receiver moving into a higher phosphorus trophic status range (meso-eutrophic).

The baseline concentrations of total copper, total lead, total zinc, pH, total aluminum, total cadmium, and total iron are above the CWQG-FAL value ranges and therefore concentrations of these parameters in the mixing zone are also outside the CWQG-FAL value ranges.

The mass balance analysis results assess water quality conditions in the receiver and determine the estimated length of the mixing zone when PoPC concentrations reach baseline or CWQG-FAL values, whichever is higher. The MDMER parameter results have a decreasing trend from the FDP toward P4, with concentrations of a number of parameters being below guideline/baseline values within the EFM at the outlet of South Brook Pond. Total lead, total copper, total cyanide and total zinc reduce to baseline concentrations farther downstream with total copper and total zinc at P1, total lead at P2, and total cyanide at P4 (Table 4). For cyanide, the CWQG-FAL value (0.005 mg/L) is for free cyanide (hydrogen cyanide (HCN) or ionic cyanide (CN-)) and not total cyanide. Free cyanide is a fraction of total cyanide (free cyanide, weak metal cyanide complexes and strong metal cyanide complexes) and the free cyanide concentration at P4 is expected to be less than the CWQG-FAL value at this location.

The effluent pH is 6.51, which is within the CWQG-FAL and MDMER criteria ranges, while South Brook is acidic with a baseline pH of 4.49.

Among non-MDMER parameters, concentrations of total ammonia as nitrogen, total iron, total manganese, nitrate as nitrogen, total selenium, total silver and total thallium at the EFM (outlet of South Brook Pond) reach CWQG-FAL or baseline values, whichever is higher in value.

For total phosphorus, the concentration at the EFM is slightly higher than the CWQG-FAL upper limit of the mesotrophic trophic range (10 to 20 µg/L). The total phosphorus concentration returns to the mesotrophic range at point P1. The total aluminum concentration is below baseline the concentration at P1.

Total cadmium concentrations exhibit a decreasing trend from the EFM (0.64 µg/L) to point P4 (0.55 µg/L), which is lower than the baseline concentration. Total chromium shows the same trend, returning to baseline concentration at P4 (1.6 µg/L).

The ultimate extents of the average condition mixing zone is defined by total cyanide, total cadmium and total chromium, which reach CWQG-FAL or baseline concentrations 6.96 km downstream of the FDP at P4, which is prior to South Brook discharging to Baie Verte.

3.2 High-Flow Scenario

Concentrations calculated using the mass balance approach in the high-flow scenario are presented in Table 5. These concentrations are for MDMER and non-MDMER PoPCs at the EFM and further downstream (P1–P4).

Table 5 High-Flow Scenario Mass Balance Analysis Results

Parameter	Unit	CWQG-FAL	FDP	Baseline	EFM	P1	P2	P3	P4
MDMER									
Arsenic, Total *	µg/L	5	300	2	6	6	6	6	5
Copper, Total *	µg/L	2	300	214	216	209	204	200	185
Cyanide, Total *	Mg/L	#	0.500	0.000	0.007	0.007	0.007	0.007	0.006#
Lead, Total *	µg/L	1.0	13.0	2.1	2.3	2.2	2.2	2.1	2.0
Nickel, Total *	µg/L	25	500	4	11	10	10	10	9
Zinc, Total *,Ψ	µg/L	A	500	183	188	183	178	175	162
Total Suspended Solids *	mg/L	15	15	10	10	10	10	9	9
Unionized Ammonia as N (Calculated) *	mg/L	0.016	0.5	1.4E-07	7.9E-07	8.9E-07	9.9E-07	1.1E-06	1.5E-06
pH, Field *	S.U.	6.5-9	6.51	4.48	4.51	4.58	4.64	4.68	4.85
Non-MDMER									
Aluminum, Total	µg/L	B	1,000	622	627	616	606	598	570
Ammonia as N, Total	mg/L	Variable	5.10	0.02	0.09	0.09	0.08	0.08	0.08
Cadmium, Total	µg/L	C	5.00	0.58	0.64	0.63	0.61	0.60	0.56
Chromium, Total	µg/L	1.0 D	17.0	1.6	1.7	1.7	1.7	1.7	1.6

Table 5 High-Flow Scenario Mass Balance Analysis Results

Parameter	Unit	CWQG-FAL	FDP	Baseline	EFM	P1	P2	P3	P4
Iron, Total	µg/L	300	3,000	3,280	3,276	3,194	3,125	3,072	2,872
Manganese, Total	µg/L	E	2,350	223	254	247	242	238	223
Nitrate-N	mg/L	3.00	30.00	0.03	0.45	0.44	0.43	0.42	0.39
Phosphorus, Total	mg/L	0.020 F	0.200	0.018	0.021	0.021	0.021	0.020	0.020
Selenium, Total	µg/L	1.0	20.0	0.3	0.5	0.5	0.5	0.5	0.5
Silver, Total	µg/L	0.25	2.50	0.05	0.08	0.08	0.08	0.08	0.08
Thallium, Total	µg/L	0.8	8.0	0.1	0.2	0.2	0.2	0.2	0.1

Notes:
- * MDMER parameter
- \# The CWQG-FAL value (0.005 mg/L) is for free cyanide and not applicable to total cyanide. Total cyanide includes the following dissolved species: free cyanide, weak metal cyanide complexes and strong metal cyanide complexes. Comparison between mass balance concentrations and the CWQG-FAL guideline was conducted under the assumption that total cyanide is not fully in the free cyanide forms. The free cyanide concentration at P4 is expected to be not greater than 0.005 mg/L based on the predicted total cyanide concentration.
- Ψ Total zinc was assumed to be completely in dissolved form to apply the CWQG-FAL.
- A Ranges between 64 and 370 µg/L
- B Ranges between 5 and 100 µg/L
- C Ranges between 0.05 and 0.09 µg/L
- D CWQG-FAL is for chromium VI, which is the lower value between CWQG-FAL values for chromium III and VI. Total chromium values were compared against the guideline value for chromium VI.
- E Ranges between 190 and 290 µg/L
- F Application of upper value of mesotrophic range (20 µg/L) as guideline limit to reduce likelihood of the receiver moving into a higher phosphorus trophic status range (meso-eutrophic).

As the same receiver water quality (75th percentile values) is used for the high-flow scenario, the baseline concentrations that exceed CWQG-FAL values/ranges are the same as the average scenario (total copper, total lead, total zinc, pH, total aluminum, total cadmium and total iron).

The MDMER parameter results that do not return to baseline or CWQG-FAL values by the EFM are total arsenic, total copper, total cyanide, total lead and total zinc. Total copper and zinc reach baseline concentrations at P1, and lead by P2. Total arsenic is equal to the CWQG-FAL value at P4, 6.96 km downstream of the FDP. As observed for the average scenario, free cyanide is a fraction of total cyanide, and the free cyanide concentration at P4 is expected to be less than the CWQG-FAL value at this location.

pH of the effluent is within the CWQG-FAL and MDMER acceptable criteria range, but with the acidic trending conditions of the receiver are reduced below the CWQG-FAL lower range value at the South Brook Pond outlet (EFM).

Among non-MDMER parameters, for total ammonia as nitrogen, total iron, total manganese, nitrate as nitrogen, total selenium, total silver and total thallium, concentrations meet the CWQG-FAL and/or baseline value, whichever is higher at the EFM.

For total phosphorus, the concentration at the EFM is slightly higher than the CWQG-FAL upper limit of the mesotrophic trophic range (10 to 20 µg/L). The total phosphorus concentration returns to the mesotrophic range at point P3 (5.21 km downstream of the FDP). The total aluminum concentration is below the baseline concentrations at P1.

Total cadmium concentrations exhibit a decreasing trend from the EFM (0.64 µg/L) to point P4 (0.58 µg/L), which is equal to the baseline concentration. Total chromium shows the same trend in the high-flow scenario and returns to the baseline concentration of 1.6 µg/L at P4.

The ultimate extents of the high-flow condition mixing zone are defined by total arsenic, total cadmium, total cyanide and total chromium with P4, 6.96 km downstream of the FDP, representing the downstream edge of mixing zones. The point P4 is prior to South Brook discharging to Baie Verte. This is the same ultimate extent as the average condition scenario.

4 Recommended Effluent Criteria

Based on the AC study results (average condition and high-flow scenarios), the recommended effluent criteria based on MDMER parameters and limits for the FDP are presented in Table 6. MDMER criteria limits have reasonable mixing zone extents in South Brook. Total lead in the raw effluent quality has a 90th percentile value of 0.013 mg/L, which is well below the MDMER Schedule 4 Table 2 value of 0.1 mg/L, and is recommended as the total lead mean monthly objective for the FDP. The recommended effluent criteria were developed for the average and maximum effluent discharge rates of 128 and 200 m^3/hr, respectively.

Table 6 Recommended Effluent Criteria

Parameter	MDMER		CWQG-FAL (mg/L)	Monthly Mean Objective (mg/L)
	Maximum Authorized Monthly Mean Concentration (mg/L)	Maximum Authorized Concentration in a Grab Sample (mg/L)		
Arsenic, Total	0.30	0.60	5	0.30
Copper, Total	0.30	0.60	0.002–0.004 [A]	0.30
Cyanide, Total	0.50	1.00	n/a [B]	0.50
Lead, Total	0.100	0.200	0.001–0.007 [A]	0.013
Nickel	0.50	1.00	0.025–0.150 [A]	0.50
Zinc, Total	0.50	1.00	0.005–0.078 [C]	0.50
Total Suspended Solids	15.00	30.00	15.00 [D]	15.00
Un-ionized Ammonia as N	0.50	1.00	0.016	0.50
pH	6.0 – 9.5		6.0 – 9.5	

Notes:
[A] Depends on hardness.
[B] CWQG-FAL is for free cyanide that is not applicable to total cyanide.
[C] Variable and a function of pH, hardness and dissolved organic carbon.
[D] Narrative "clear flow: Maximum increase of 25 mg/L from background levels for any short-term exposure (e.g., 24-hr period). Maximum average increase of 5 mg/L from background levels for longer term exposures (e.g., inputs lasting between 24 hr and 30 d)."

5 Summary

FireFly is expanding its underground mining operations in the Green Bay Ming Mine Project, located in Newfoundland and Labrador. This expansion involves increased production, a new process plant, and a TMF. An AC study was conducted to evaluate potential water quality changes in South Brook Pond (South Brook Pond) and the downstream South Brook watercourse due to the discharge of treated operations effluent. The AC study used mass balance analyses to determine surface water quality changes in South Brook under expected average and high-flow operational conditions. Effluent quality limits and objectives were established based on MDMER criteria, expected operations WWMP system effluent quality, CWQG-FAL values and effluent raw water quality, and the results of this AC study. PoPCs identified within the receiver were total copper, total lead, total zinc, pH, total aluminum, total cadmium, total chromium, and total iron. Mixing zones were identified where effluent parameter concentrations exceeded CWQG-FAL values but returned to either the CWQG-FAL or baseline receiver concentration (receiver PoPCs), whichever were higher in value.

For the average operation condition (average flow at FDP and receiver), most effluent parameters were at CWQG-FAL or baseline receiver concentration values by the EFM (outlet of South Brook Pond; 1.02 km downstream of the FDP). The MDMER parameters total copper, total lead and total zinc returned to baseline conditions at P1 (2.65 km downstream of FDP), P2 (3.38 km downstream of FDP) and P1 respectively. For total cyanide, P4 (6.96 km downstream of FDP) was identified as the downstream edge of the mixing zone with the free cyanide concentration expected to be below the CWQG-FAL value. The non-MDMER parameters total phosphorus, total aluminum, total chromium and total cadmium, returned to CWQG-FAL or baseline condition ranges/values at P1, P1, P4 and P4 (6.96 km downstream of FDP), respectively. The extent of the ultimate mixing zone, determined by total cyanide, total cadmium and total chromium, is prior to where South Brook discharges into the Baie Verte marine environment.

In the high-flow scenario, where maximum discharge at the FDP and 80th percentile discharge at sub-watersheds were used, results were similar to the average scenario. The differences from the average condition scenario were for total lead and total phosphorus with mixing zones ending farther downstream at P3, and total arsenic with P4 being the downstream edge of the mixing zone.

The results obtained in two scenarios indicate that the assimilative capacity of South Brook Pond and downstream receivers is sufficient to accommodate the projected effluent discharge while maintaining water quality within regulatory limits prior to discharge to the marine environment.

Attachments:	Attachment A	Figure
	Attachment B	75th Percentile Receiver Water Quality

6 References

Canadian Council of Ministers of the Environment (CCME). 2000. Canadian Council of Ministers of the Environment. Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life for Cadmium. Canadian Council of Ministers of the Environment.

CCME. 2003. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Guidance on the Site-Specific Application of water quality guidelines in Canada: Procedures for deriving numerical water quality objectives. In: Canadian Environmental Quality Guidelines. Winnipeg

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Ecometrix Consulting Inc (Ecometrix). 2024. Preliminary Effluent Quality Evaluation in Support of the Green Bay Ming Mine Project. Memo.

Stantec Consulting Limited (Stantec). 2023. Ming Mine Phase 4 Environmental Effects Monitoring (EEM) Interpretive Report – Complete Submission. Prepared for Rambler Metals and Mining Canada Ltd., Baie Verte, NL. March 10, 2023.

FireFly Metals Canada Limited (FireFly). 2025. Green Bay Ming Mine Project – Environmental Registration. Section 6.3 – Surface Water Resources.

Attachment A Figure

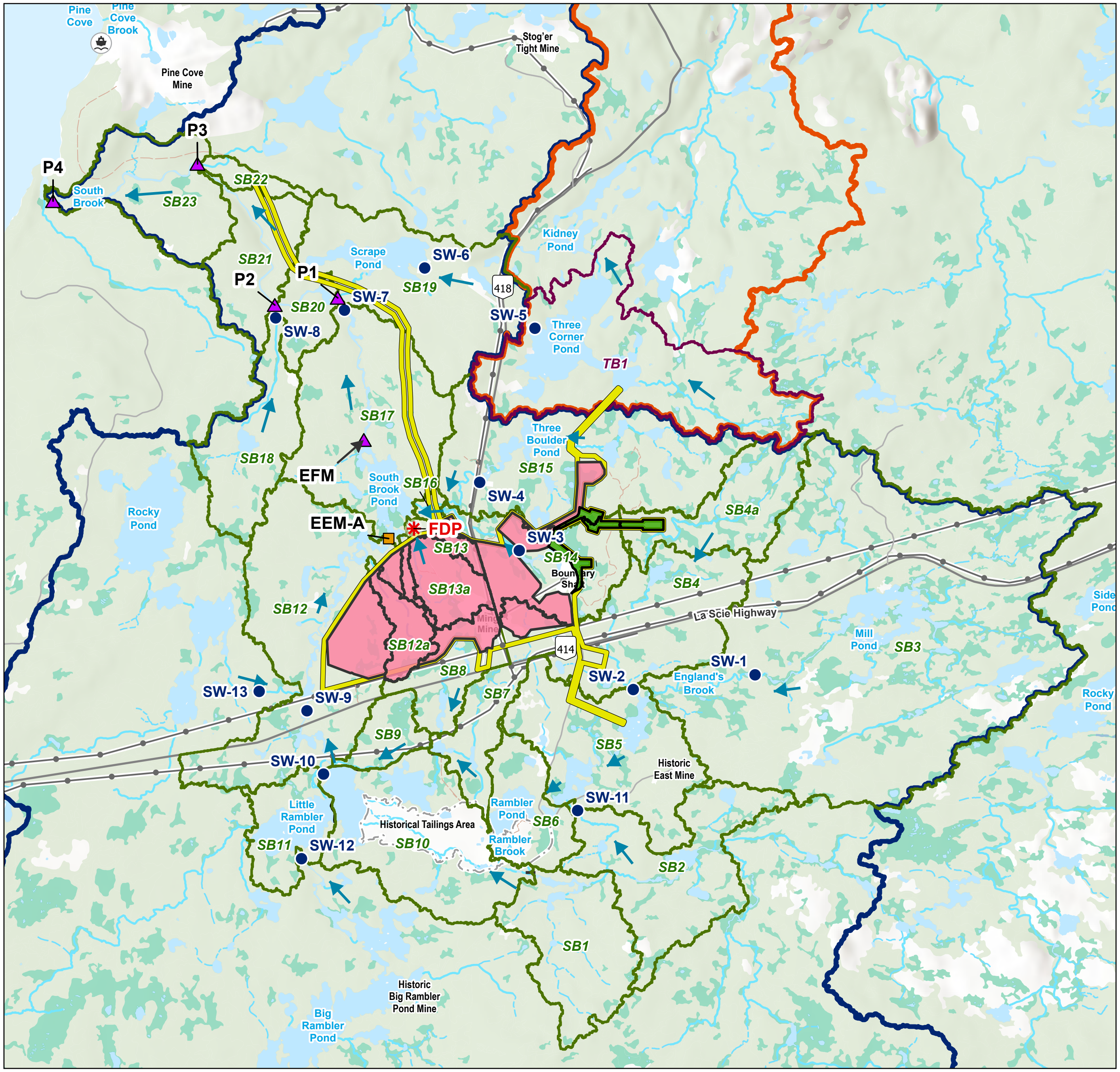
Figure A1 Sub-watersheds within South Brook Watershed and Monitoring Sites

Figure No.
6.C.1
Title
Assimilative Capacity Assessment

Client/Project 121418199_2_002
FireFly Metals Ltd
Green Bay Copper-Gold Project

Project Location
Baie Verte, NL

Prepared by MB on 2025-03-28
Revised 2025-04-14
IR by AS 2025-04-07



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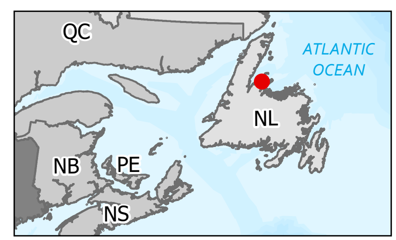
- Environmental Effects Monitoring
- Mass Balance Analysis Point
- Surface Water Quality Monitoring Station
- Site Drainage to Wastewater Management Plant (WWMP)
- Site Drainage to WWMP or FDP
- South Brook subcatchment
- Three Corner Pond subcatchment
- Trimms Brook Watershed
- South Brook Watershed
- Project Area
- Final Discharge Point (FDP)
- Port
- Dam
- Flow Direction
- Highway
- Arterial / Collector
- Powerline
- Highway
- Arterial / Collector
- Indeterminate Stream
- Intermittent Watercourse
- Definite Watercourse
- Waterbody



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

Attachment B 75th Percentile Receiver Water Quality

Table B1 PoPCs 75th Percentile Concentrations

Parameter	Unit	SW-3	SW-4	SW-3/SW-4 Mixed	SW-9	Reference [1]
pH, Field	S.U.	3.29	6.70	5.96	4.44	6.91
Cyanide, Total [2]	µg/L	0	0	0	0	0
Nitrate (as N)	mg/L	0.03	0.03	0.03	0.03	0.03
Phosphorus, Total	mg/L	0.092	0.020	0.036	0.018	0.014
Total Ammonia as N, Tota	mg/L	0.02	0.02	0.02	0.02	0.02
Unionized Ammonia as N (Calculated)	mg/L	5.8E-09	1.8E-05	3.6E-06	1.3E-07	3.5E-05
Aluminum, Total	µg/L	4,500	116	1,081	607	224
Arsenic, Total	µg/L	24	1	6	2	1
Cadmium, Total	µg/L	6.29	0.05	1.41	0.56	0.05
Chromium, Total	µg/L	11.0	1.0	3.2	1.5	1.0
Copper, Total	µg/L	8,713	4	1,912	160	1
Iron, Total	µg/L	32,493	227	7,306	3,150	443
Lead, Total	µg/L	2.8	0.3	0.8	2.2	0.3
Manganese, Total	µg/L	852	413	495	215	40
Nickel, Total	µg/L	26	1	6	4	1
Selenium, Total	µg/L	1.4	0.2	0.4	0.3	0.2
Silver, Total	µg/L	0.05	0.05	0.05	0.05	0.05
Thallium, Total	µg/L	0.1	0.1	0.1	0.1	0.1
Zinc, Total	µg/L	1,258	9	283	180	10
Total Suspended Solids	mg/L	10	1	3	10	1

Notes:

1 Reference riverine quality as presented in Chapter 6.3 of Environmental Registration (FireFly 2025)

2 As total cyanide is not a naturally occurring compound and water quality monitoring results in the receiver were below detection (2 µg/L), the receiver concentration was assumed to be 0 µg/L)

Appendix 6.D Vegetation and Wetlands Baseline Survey Report

FireFly
METALS

Green Bay Ming Mine Project – 2024 Vegetation and Wetland Baseline Survey

Final Report

March 31, 2025

Prepared for:
Firefly Metals Canada
P.O. Box 610
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Prepared by:
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File Number:
121418199

Limitations and Sign-off

The conclusions in the Report titled Green Bay Ming Mine Project – 2024 Vegetation and Wetland Baseline Survey are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Firefly Metals Canada (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Executive Summary

FireFly Metals Canada Ltd is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador, Canada. The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district.

To support the development and environmental assessment of the Project, Stantec Consulting Ltd. conducted a vegetation and wetland baseline program. The purpose of the program was to gain an understanding of conditions related to vegetation and wetlands within the Project Area to support the environmental assessment of the Project.

Prior to the commencement of field surveys, a literature review was conducted to compile known information on the surrounding terrestrial environment, which included an Atlantic Canada Conservation Data Centre data request. No vascular plant Species at Risk (SAR) and four vascular plant Species of Conservation Concern (SOCC) have previously been recorded on the Baie Verte Peninsula within reviewed sources. No lichen SAR have been recorded on the peninsula, and lichen SAR are considered unlikely to occur in this area.

Vascular plant surveys were conducted within representative habitats throughout the Project Area and surrounding Study Area. All vascular plants were recorded on first encounter, and any rare species were recorded each time they were encountered, along with information such as habitat and population size. During these surveys, encountered vegetation community descriptions were recorded. Lichen field surveys were not conducted. During surveys, 230 vascular plant species or genera were observed, including three vascular plant SOCC. One of the vascular plants SOCC, bog willow (*Salix pedicellaris*, S2S3), is within the Project Area.

Wetland functional assessment was completed within eight wetlands or portions of wetlands currently within or overlapping with the Project Area using the Wetland Ecosystems Services Protocol for Atlantic Canada: Non-tidal Wetlands method. Most of the functional assessments were completed in portions of expansive peatlands that are common within the Project Area. The assessed wetlands frequently scored higher for many types of aquatic and wildlife habitat functions, and also phosphorus retention function and organic nutrient export function. Functional assessments were not completed in areas that have been impacted by past mining activities, and wetland functions in these areas may differ from assessed wetlands.

Wetland interpretation was completed within the Project Area using various data sources, including Project-flown high-resolution imagery and a hillshade model created from Project-flown light detecting and ranging (LiDAR) data. Within the Project Area, 137.4 hectares (ha) of wetland were interpreted, representing 44% of the Project Area. This is an increase in area relative to provincially mapped wetlands, which commonly under represent wetland area within the Province.

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Acronyms / Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
GIS	Geographic Information System
ha	hectares
km	kilometre
NBDELG	New Brunswick Department of Environment and Local Government
NL	Newfoundland and Labrador
NLDFFA	Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture
NL ESA	Newfoundland and Labrador *Endangered Species Act*
SAR	Species at Risk
SARA	*Species at Risk Act*
SOCC	Species of Conservation Concern
WESP-AC	Wetland Ecosystem Services Protocol for Atlantic Canada

1 Introduction

FireFly Metals Canada Ltd (FireFly) is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador (NL), Canada (Figure 1.1). The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district. To support the development and environmental assessment of the Project, Stantec Consulting Ltd. (Stantec) was retained by FireFly to complete a vegetation and wetlands baseline program. This report summarizes the field methods and results from the 2024 surveys.

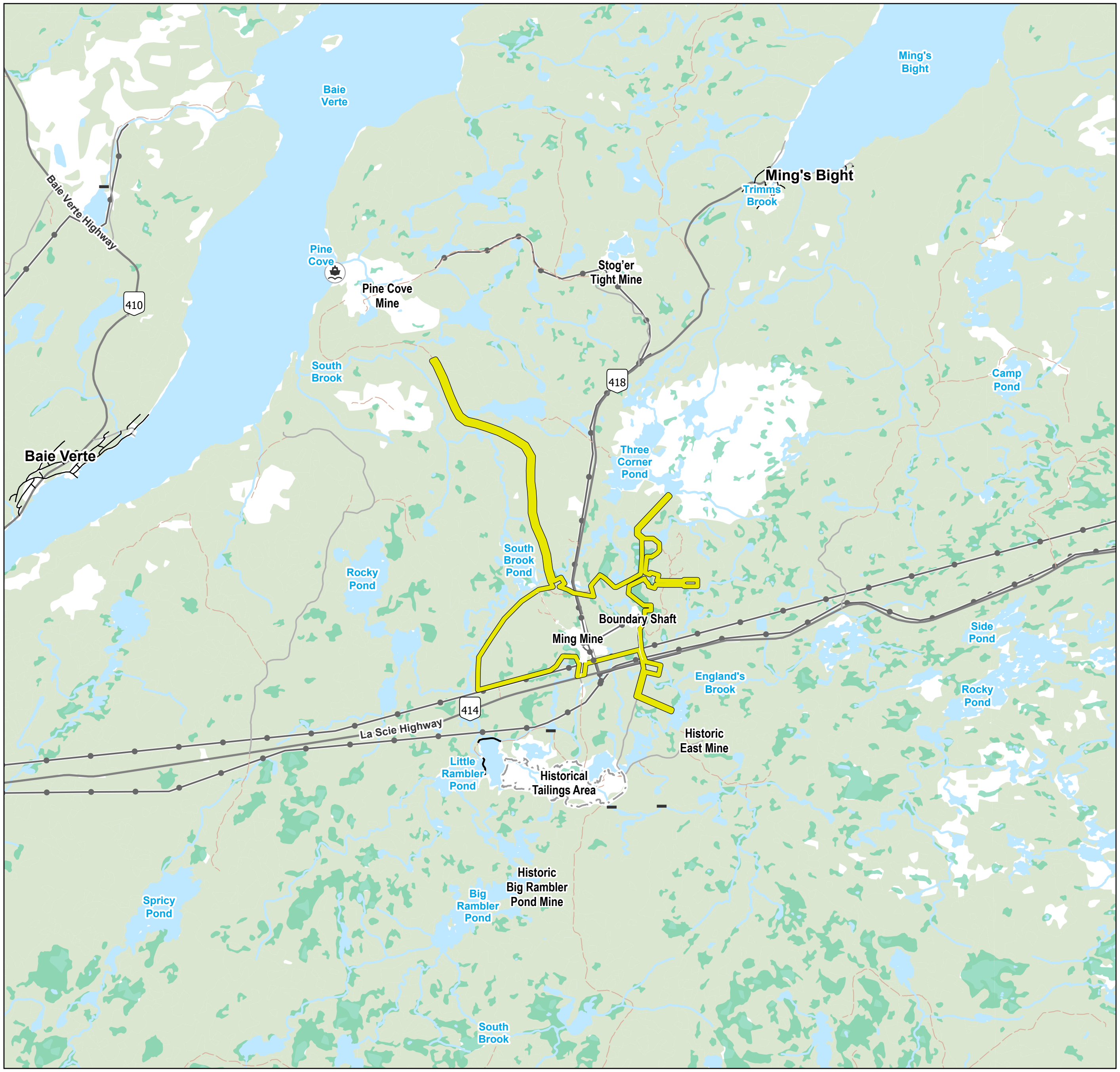


Figure No.
1.1

Title
Green Bay Ming Mine Project Location

Client/Project 121418199_008
FireFly Metals Ltd
Green Bay Ming Mine Project

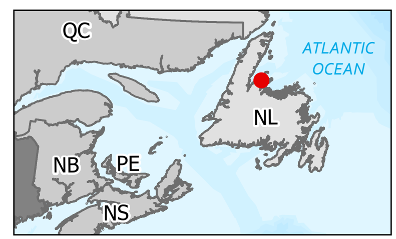
Project Location
Baie Verte, NL

Prepared by MB on 2024-12-09
Revised 2025-03-19
TR by NW on 2025-01-07

N

0 1 2 Kilometres
(At original document size of 8.5x11)
1:90,000

- Project Area
- Port
- Dam
- Highway
- Arterial / Collector
- Local Road
- Resource Road / Trail
- Powerline
- Watercourse
- Waterbody
- Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec,
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

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1.1 Regulatory Setting

For the purposes of this report, Species at Risk (SAR) are defined as:

- species listed as endangered, threatened, or special concern on Schedule 1 of the federal *Species at Risk Act* (SARA)
- species listed as endangered, threatened, or vulnerable on the Newfoundland and Labrador *Endangered Species Act* (NL ESA)
- species assessed as endangered, threatened, or special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Species of Conservation Concern (SOCC) are defined as those species not meeting the above criteria, but with a provincial S-Rank of S1, S1S2, S2, or S2S3, as assigned by the Atlantic Canada Conservation Data Centre (AC CDC). Rank definitions for SARA, NL ESA, COSEWIC, and AC CDC can be found in Appendix A.

Provincially, wetland conservation is addressed by the Newfoundland and Labrador *Policy for Development in Wetlands* (Government of Newfoundland and Labrador 2001). The policy identifies developments that are not permitted within wetlands and defines activities that require permitting under Section 48 of the NL *Water Resources Act*. Those developments that are not permitted include:

- Infilling, drainage, dredging, channelization, removal of vegetation cover or removal of soil or organic cover of wetlands which could aggravate flooding problems, or have unmitigable adverse water quality, water quantity or hydrologic impacts.
- Development in wetlands which are located within the recharge zones of domestic, municipal or private groundwater wells.
- Placing, depositing or discharging any raw sewage, refuse, municipal or industrial wastes, fuel or fuel containers, pesticides, herbicides or other chemicals or their containers, or any other material which impairs or has the potential to impair the water quality of wetlands.

Permitting is required for developments such as disturbances to wetlands for the extraction of peat, for agricultural or forestry operations, construction of linear corridors, and infilling, dredging or other disturbance of wetlands for the construction of residential, commercial, industrial and institutional facilities, or extension and upgrading of existing buildings and facilities within wetland areas.

The Lieutenant-Governor in Council may, under Section 64 of the NL *Water Resources Act*, make regulations related to the use of and modification of wetlands, including drainage for any purpose, though no specific regulations protecting wetlands currently exist.

2 Methods

2.1 Literature Review

Existing data sources from federal and provincial government agencies, peer-reviewed published literature, other publications and data sources, and communications with the NL Department of Fisheries, Forestry and Agriculture (NLDFFA) - Wildlife Division were reviewed to compile information on the terrestrial environment, including SAR and SOCC. The following key public resources were consulted:

- NLDFFA forest and non-forest spatial data
- AC CDC observation data on SAR / SOCC within 5 kilometres (km) of the Project
- COSEWIC Assessment and Status Update Reports
- Provincial Status and Recovery Plans for SAR / SOCC
- Stog'er Tight Expansion Project Environmental Registration (Stantec 2022)
- Hammerdown Gold Project – Environmental Assessment Registration (Maritime Resources Corporation 2020)
- Argyle Gold Project – Appendix A (Environmental Baseline Studies) of the Environmental Assessment (GEMTEC 2018)

2.2 Vegetation Surveys

Vegetation surveys were completed using an intelligent meandering approach within the range of habitats in the Project Area from July 27 to August 1, 2024. During these surveys, vascular plant including potentially invasive species were recorded on first observation. Rare species encountered were recorded within the ESRI Field Maps app each time they were observed, and pertinent details such as population size were also recorded. Provincial forest, wetland, and non-forest inventory data were summarized for the Project Area. Vegetation community descriptions were also recorded within each newly encountered habitat, including dominant species in each stratum. Vegetation surveys were conducted within the Project Area as it was defined at the time of surveys. The Project design has since been refined and some surveyed areas are now outside of the Project Area within the larger Study Area.

A land cover dataset was compiled for the Project Area from NLDFFA forest and non-forest spatial data, which was updated to reflect recent changes to cleared areas from mining activities in the area. Interpreted wetland boundaries (Section 2.4) were merged with the land cover information compiled from NLDFFA forest and non-forest spatial data to create an updated land cover dataset for the Project Area.

Lichen SAR are considered unlikely to occur in the Project Area or Study Area (AC CDC 2024), and lichen field surveys were not conducted in support of the Project. The assessment of lichens is based on the known distributions of lichen SAR as described in COSEWIC status reports.

2.3 Wetland Functional Assessment

Wetland functional assessments were completed for ten wetlands or portions of wetlands that were within the Project Area at the time of survey using the Wetland Ecosystems Services Protocol for Atlantic Canada: Non-tidal Wetlands (WESP-AC, New Brunswick Department of Environment and Local Government [NBDELG] 2018) assessment form version 3.3. This method includes both a field form completed during a site visit and an office form completed using a Geographic Information System (GIS). Together the results of these assessments calculate scores for twenty different wetland functions and benefits that largely fall into the categories of hydrologic, water and climate protection, aquatic support, aquatic habitat, and transition habitat. The scores for assessed functions are ranked as lower, moderate, or higher, based on their relationship to a set of regional calibration wetlands (NBDELG 2018). Wetlands in areas that contain visibly historically affected soils were not assessed. The surveyor marked the location where they completed the functional assessment using the ESRI Field Maps app. Several of the locations where functional assessment forms were completed are outside of the current Project Area boundary. Two of these locations are far enough outside of the Project Area that they are not included in this report, but three other functional assessment locations are adjacent to the Project Area and assess wetlands that are largely within the Project Area; these functional assessments have been included in this report.

2.4 Wetland Interpretation

Wetland interpretation was completed within the Project Area using a variety of sources, including a hillshade model created from Project-flown light detection and ranging (LiDAR) data, Project-flown high-resolution imagery, satellite imagery, and provincial land use data.

Using these datasets, the Project Area was reviewed for areas that are deemed likely to be wetlands based on the available information and a wetland shape following assumed boundaries was created. To supplement the accuracy of the created polygons, incidental field observations of wetland boundaries and wetland community field descriptions were used where possible to more accurately interpret the wetland boundaries (Section 2.2).

3 Results

The Project is located within the Northcentral Subregion of the Central Newfoundland Forest Ecoregion, near the boundary of the North Shore Forest Ecoregion (Newfoundland and Labrador Department of Environment and Climate Change n.d.). The landscape in the general area of the Project is a mix of dense vegetation, wetlands, and ponds. Black spruce (*Picea mariana*), balsam fir (*Abies balsamea*) and, to a lesser extent, white birch (*Betula papyrifera*), are common (Meades 1990). White spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*), and alders (*Alnus* spp.) also occur in some areas. Barrens dominate along coastal headlands to the north and east of the Project Area (Meades 1990). Several historical mining sites exist within or upstream of the Project Area or larger Study Area. The Project Area includes areas associated with the Boundary Shaft) and areas downstream of Rambler Consolidated Tailings (historic tailings), where surface water is considered to be affected by historic mining activities, with elevated levels of metals / metalloids (e.g., zinc, copper), and acidic conditions (Figure 1.1).

3.1 Vegetation Literature Review

No vegetation SAR and four vegetation SOCC were previously reported on the Baie Verte Peninsula from the reviewed data sources: data received from AC CDC, the Stog'er Tight Registration document, and the Anaconda Argle baseline report (Table 3.1; GEMTEC 2018; Stantec 2022; AC CDC 2024).

Table 3.1 Vascular Plant SOCC Previously Reported on the Baie Verte Peninsula

Scientific Name	Common Name	AC CDC S Rank[1]	Data Source
Chimaphila umbellata	common wintergreen	S2	GEMTEC 2018; Stantec 2022; AC CDC 2024
Potamogeton amplifolius	large-leaf pondweed	S2S3	Stantec 2022
Potamogeton praelongus	white-stem pondweed	S2S4	Stantec 2022
Sparganium fluctuans	floating bur-reed	S2S3	AC CDC 2024

[1] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S#S# = range of uncertainty about the status (AC CDC 2023, 2025).

The AC CDC Expert Opinion Maps indicate that mountain holly fern (*Polystichum scopulinum*), a fern with no provincial S Rank, but listed as threatened by COSEWIC and on Schedule 1 of SARA, is possible within the Project Area (AC CDC 2024). There are no records of it within 5 km of the Project Area, and the only record of it within the province is from 1950, when it was found on serpentine soils in Humber West, in western Newfoundland. This population could not be relocated during surveys of the reported area conducted in 2000 (COSEWIC 2005). Black ash (*Fraxinus nigra*) and other vascular plant SAR are not mentioned in the AC CDC Expert Opinion Maps (AC CDC 2024). The published range of black ash extends to the southern portion of the Baie Verte Peninsula but does not include the northern portion of the peninsula or the Project Area (COSEWIC 2018).

Boreal felt lichen (*Erioderma pedicellatum*, boreal population ranked special concern by COSEWIC) is considered possible but unlikely to occur within the Project Area by the AC CDC Expert Opinion Maps (AC CDC 2024). On the Island of Newfoundland, this species is primarily known from the east coast and south-central areas, with the only two records in the northern half of the Island on the Northern Peninsula (COSEWIC 2014). Other lichen SAR known to occur on the Island of Newfoundland are not known from this region and thus are unlikely to occur within the Project Area. Vole ears (*Erioderma mollissimum*, ranked endangered by COSEWIC) is currently only known from the Avalon Peninsula on very old balsam fir of a stage that was not noted within the Project Area (COSEWIC 2021). Wrinkled shingle lichen or wrinkled shield lichen (*Pannaria lurida*, ranked threatened by COSEWIC) is historically known from only two locations on the Island of Newfoundland, the closest of which was on the Northern Peninsula (COSEWIC 2016). This species is known to occur within 10 m of cliff edges on white spruce, habitat that was not encountered in the Project Area and thus this species is unlikely to occur within the Project Area. Blue felt lichen (*Degelia plumbea*, ranked special concern by COSEWIC) is known from the Avalon Peninsula and southern coast of the Island of Newfoundland (COSEWIC 2010). On the Island of Newfoundland, this species has only been recorded on yellow birch (*Betula alleghaniensis*) and white spruce, as well as Norway maple (*Acer platanoides*) and other non-native species, which were not recorded within the Project Area.

3.2 Vegetation Surveys

A total of 230 vascular plant species or genera were observed during field surveys conducted in support of the Project (Appendix A). No vegetation SAR and three vascular plant SOCC were observed during these field surveys (Table 3.2). The observations of slender cotton-grass (*Eriophorum gracile*, S1S2) are outside of the current Project Area; although, three observations of this species were recorded within the Study Area (Figure 3.1). Similarly, wild calla (*Calla palustris*, S2S3) was not observed within the Project Area, but was observed at two locations within the same wetland within the Study Area. Bog willow (*Salix pedicellaris*, S2S3) was observed within two separate wetlands within the Project Area. One observation was in a wetland adjacent to the current boundary shaft area (Figure 3.1). The other was in a lacustrine wetland adjacent to the water intake area (Point A), located on England's Brook.

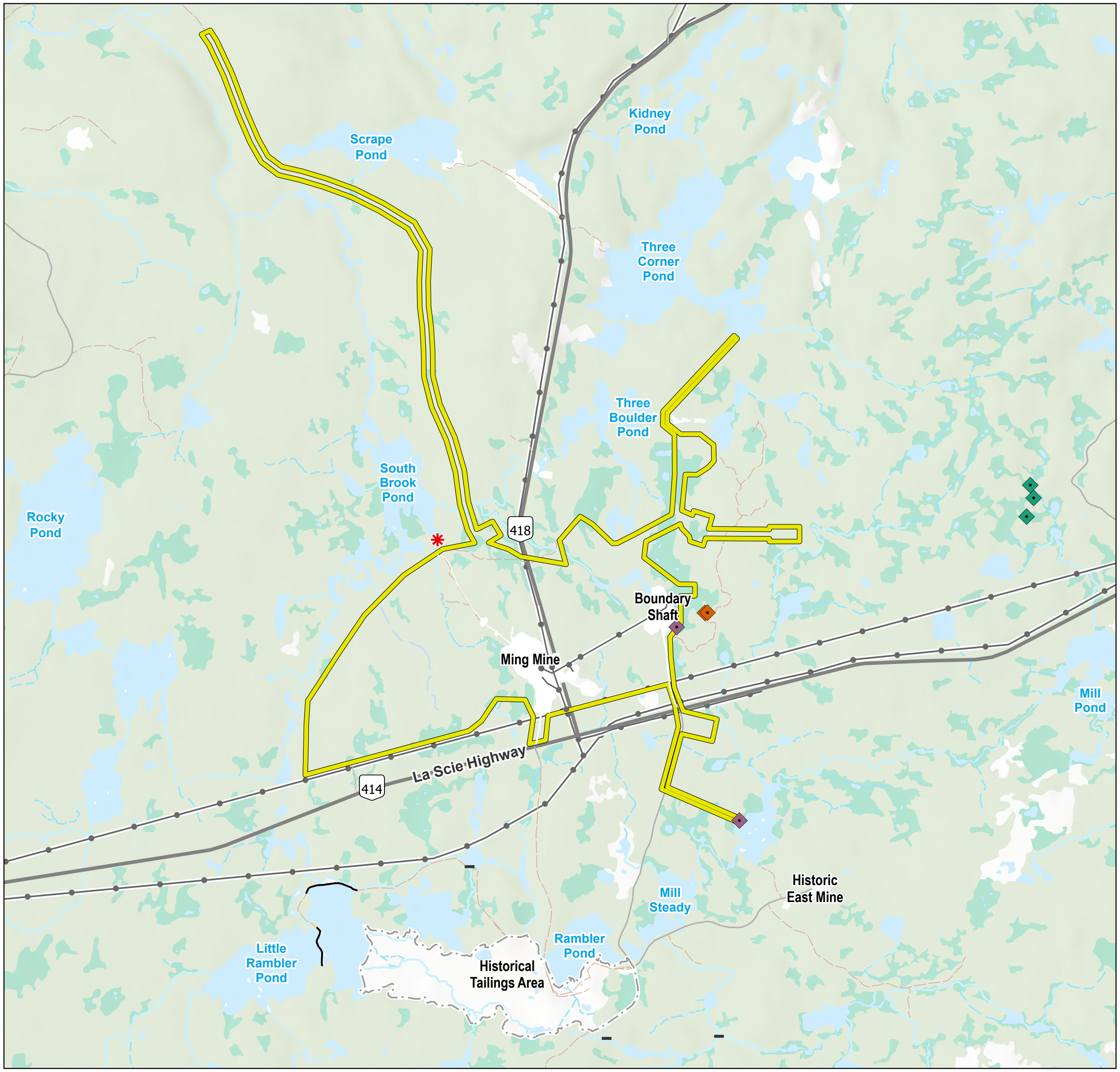

Figure No.
3.1

Title
Vascular Plant SOCC Observed Within and Near the Project Area

Client/Project
FireFly Metals Ltd
Green Bay Ming Mine Project

121418199_6_003

Project Location
Baie Verte, NL

Prepared by SC on 2024-12-18
Revised on 2025-03-19
TR by MB on 2025-03-19

N

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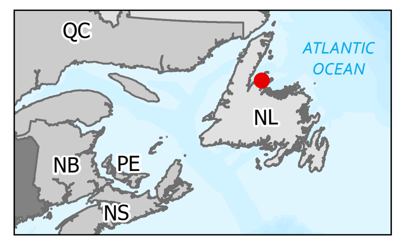
Metres
(At original document size of 8.5x11)
1:40,000

- Project Area
- Bog Willow, *Salix pedicellaris*
- Slender Cotton-Grass, *Eriophorum gracile*
- Wild Calla, *Calla palustris*
- Final Discharge Point (FDP)
- Dam
- Highway
- Arterial / Collector
- Resource Road / Trail
- Power Line
- Indeterminate Stream
- Intermittent Watercourse
- Definite Watercourse
- Forested Area
- Wetland
- Waterbody



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

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Table 3.2 Vascular Plant SOCC Observed During 2024 Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]	Observations in Project Area (n)	Observations in Study Area, outside Project Area (n)
Eriophorum gracile	slender cotton-grass	S1S2	0	3
Calla palustris	wild calla	S2S3	0	2
Salix pedicellaris	bog willow	S2S3	2	0

[1] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S#S# = range of uncertainty about the status (AC CDC 2023, 2025).

Eleven other uncommon vascular plant species ranked S3 (vulnerable) were observed within or near the Project Area (Appendix A).

Although NL has no official list of invasive species present within the province, the list of plants observed during field surveys was reviewed for species that are considered potentially invasive in other jurisdictions. Three potentially invasive species, creeping buttercup (*Ranunculus repens*), colt's-foot (*Tussilago farfara*), and reed canary grass (*Phalaris arundinacea*) were noted during vascular plant surveys. Creeping buttercup was noted in two locations, both of which are outside of the current Project Area. Colt's-foot was noted in four locations: two adjacent to existing roads within the Project Area, one adjacent to Highway 414 in the Study Area, and one within a transmission line right-of-way within the Study Area. Reed canary grass was noted adjacent to an existing road within the Project Area.

3.2.1 Vegetation Community Descriptions

Six vegetation communities were encountered within the Project Area and are described below.

Open coniferous woodlands are upland areas that are dominated by an open canopy of young to mid-aged black spruce and balsam fir that are regenerating from past cutting or disturbance. Shrubs such as rhodora (*Rhododendron canadensis*), late lowbush blueberry (*Vaccinium angustifolium*), and sheep-laurel (*Kalmia angustifolia*), grow abundantly in the openings. Other shrubs, such as wild red raspberry (*Rubus idaeus* subsp. *strigosus*), and common Labrador-tea (*Rhododendron groenlandicum*), occur occasionally. Common species of herbaceous flora include Clinton lily (*Clintonia borealis*), dwarf dogwood (*Cornus canadensis*), twinflower (*Linnaea borealis*), northern starflower (*Lysimachia borealis*), pearly everlasting (*Anaphalis margaritacea*), fireweed (*Chamerion angustifolium*), woodland horsetail (*Equisetum sylvaticum*), and bracken (*Pteridium aquilinum*). Bare areas within these cut over / disturbed areas are often covered in *Cladonia* lichen.

Upland forests in the Project Area have a closed canopy and are generally dominated by mid-aged balsam fir. Associated tree and large shrub species, such as paper birch, heartleaf birch (*Betula cordifolia*), mountain maple (*Acer spicatum*), and black spruce, occur sporadically. The ground layer in these forests is relatively sparse due to shading. Common ground layer species include twinflower, northern starflower, creeping snowberry (*Gaultheria hispidula*), dwarf dogwood, wild sarsaparilla (*Aralia nudicaulis*), wild lily-of-the-valley (*Maianthemum canadense*), and bracken.

Wetland habitats including fens, bogs (shrub dominated and treed), marshes, and shrub swamps were encountered in the Project Area.

Fens are common and widespread in the Project Area. They are mainly open graminoid peatlands dominated by sedges with sporadic shrubs or stunted trees. Characteristic and dominant herbaceous plant species include deergrass (*Trichophorum cespitosum*), slender sedge (*Carex lasiocarpa*), yellow sedge (*Carex flava*), few-seeded sedge (*Carex oligosperma*), Buxbaum's sedge (*Carex buxbaumii*), white beakrush (*Rhynchospora alba*), water horsetail (*Equisetum fluviatile*), and coast sedge (*Carex exilis*). Other herbaceous species that occur frequently, but not in great abundance include bog goldenrod (*Solidago uliginosa*), northern pitcher-plant (*Sarracenia purpurea*), and bog aster (*Oclemena nemoralis*). Common shrub species in these communities include golden-hardhack (*Dasiphora fruticosa*), bog rosemary (*Andromeda polifolia*), swamp birch (*Betula pumila*), sweet bayberry (*Myrica gale*), creeping juniper (*Juniperus horizontalis*), Newfoundland dwarf birch (*Betula michauxii*), and alderleaf buckthorn (*Endotropis alnifolia*). Stunted and sporadic American larch (*Larix laricina*) are common. Stunted black spruce is present but is less common than American larch. Sphagnum mosses occur occasionally to abundantly throughout fen areas.

Fens can receive water from multiple input types, and water movement within fens is both horizontal and vertical (Vitt 2013). Peat depths in various types of fens can range from 1 to 3 m (National Wetlands Working Group [NWWG] 1997). The fens in the Project Area and surrounding Study Area can largely be classified as poor fens (i.e., relatively nutrient poor, with a pH less than 5.5, typically containing more than 20% abundance of *Sphagnum* mosses), based on their dominant vegetation (Environment and Climate Change Canada [ECCC] 2023).

Bogs are less common than fens in the Project Area. They typically have an open canopy of black spruce as well as small, shrub-level black spruce. The shrub layer is comprised of Ericaceous shrubs such as common Labrador-tea, rhodora, leatherleaf (*Chamaedaphne calyculata*), sheep-laurel, and pale laurel (*Kalmia polifolia*). Creeping shrubs, such as small cranberry (*Vaccinium oxycoccos*), cloudberry (*Rubus chamaemorus*), and creeping snowberry, are also common. Characteristic herbaceous species include boreal bog sedge (*Carex magellanica*), three-leaf Solomon's-plume (*Maianthemum trifolium*), goldthread (*Coptis trifolia*), few-flowered sedge (*Carex pauciflora*), tawny cotton-grass (*Eriophorum virginicum*), and roundleaf sundew (*Drosera rotundifolia*). Sphagnum mosses occur abundantly throughout bog areas, and underlying peat can be many meters thick (NWWG 1997). Bogs receive water from precipitation, snowmelt, and sometimes fog, and water movement is vertical (NWWG 1997; Vitt 2013). They often contain open water depressions in their centres known locally as bogholes (also called flarks). The pH of bogs is lower than that of fens; many bogs form from fens over time, and transitional areas exist within the Project Area.

Marshes in the Project Area are generally small and associated with watercourses. They are dominated by sedges and to a lesser extent grasses, rushes and other wetland forbs. Bear sedge (*Carex utriculata*) is a dominant species of sedge in marshes in the Project Area. Other characteristic species include Canada manna-grass (*Glyceria canadensis*), black-girdle bulrush (*Scirpus atrocinctus*), swamp aster (*Symphyotrichum puniceum*), sensitive fern (*Onoclea sensibilis*), little prickly sedge (*Carex echinata*), stalk-grain sedge (*Carex stipata*), blueflag (*Iris versicolor*), water horsetail, soft rush (*Juncus effusus*), narrow-panicled rush (*Juncus tweedyi*), yellow sedge and small fruit bulrush (*Scirpus microcarpus*). Water levels in marshes vary in response to climatic conditions and are highly dynamic (NWWG 1997).

Shrub swamps in the Project Area are typically small and grow in depressions between upland areas. They are dominated by dense green alder (*Alnus alnobetula*), and to a lesser extent speckled alder (*Alnus incana*). The ground layer in these swamps contains many of the same herbaceous species found in marsh communities, but in different relative amounts. Common ground species include three-seed sedge (*Carex trisperma*), tall meadow-rue (*Thalictrum pubescens*), northern oak fern (*Gymnocarpium dryopteris*), purple avens (*Geum rivale*), fowl manna-grass (*Glyceria striata*), rough-leaved aster (*Eurybia radula*), northern beech fern (*Phegopteris connectilis*) and cinnamon fern (*Osmundastrum cinnamomeum*). Smaller shrubs such as squashberry (*Viburnum edule*), Bartram shadbush (*Amelanchier bartramiana*) and mountain holly (*Ilex mucronata*) occur occasionally.

3.3 Wetland Functional Assessment

Appendix B provides the WESP-AC complete assessment datasheets. Grouped function ratings for assessed wetlands are presented in Table 3.3. The locations where the wetland functional assessments were completed are shown in Figure 3.2.

Table 3.3 Grouped Function Ratings of Wetlands Assessed for Function in the Project Area

Wetland FA ID	Grouped Function Ratings				
	Hydrologic	Water & Climate Protection[1]	Aquatic Support	Aquatic Habitat	Transition Habitat
WL1	Lower	Higher	Higher	Higher	Higher
WL2	Moderate	Moderate	Higher	Higher	Higher
WL3	Moderate	Higher	Higher	Higher	Higher
WL4	Moderate	Higher	Higher	Higher	Higher
WL5	Moderate	Higher	Higher	Higher	Higher
WL6	Moderate	Higher	Higher	Higher	Higher
WL7	Moderate	Higher	Moderate	Moderate	Higher
WL8	Lower	Moderate	Higher	Higher	Higher

Note:

The Wetland FA IDs differ from the Wetland IDs presented in Table 3.4. Some wetland FAs were completed in different portions of large, expansive wetlands within the Project Area.

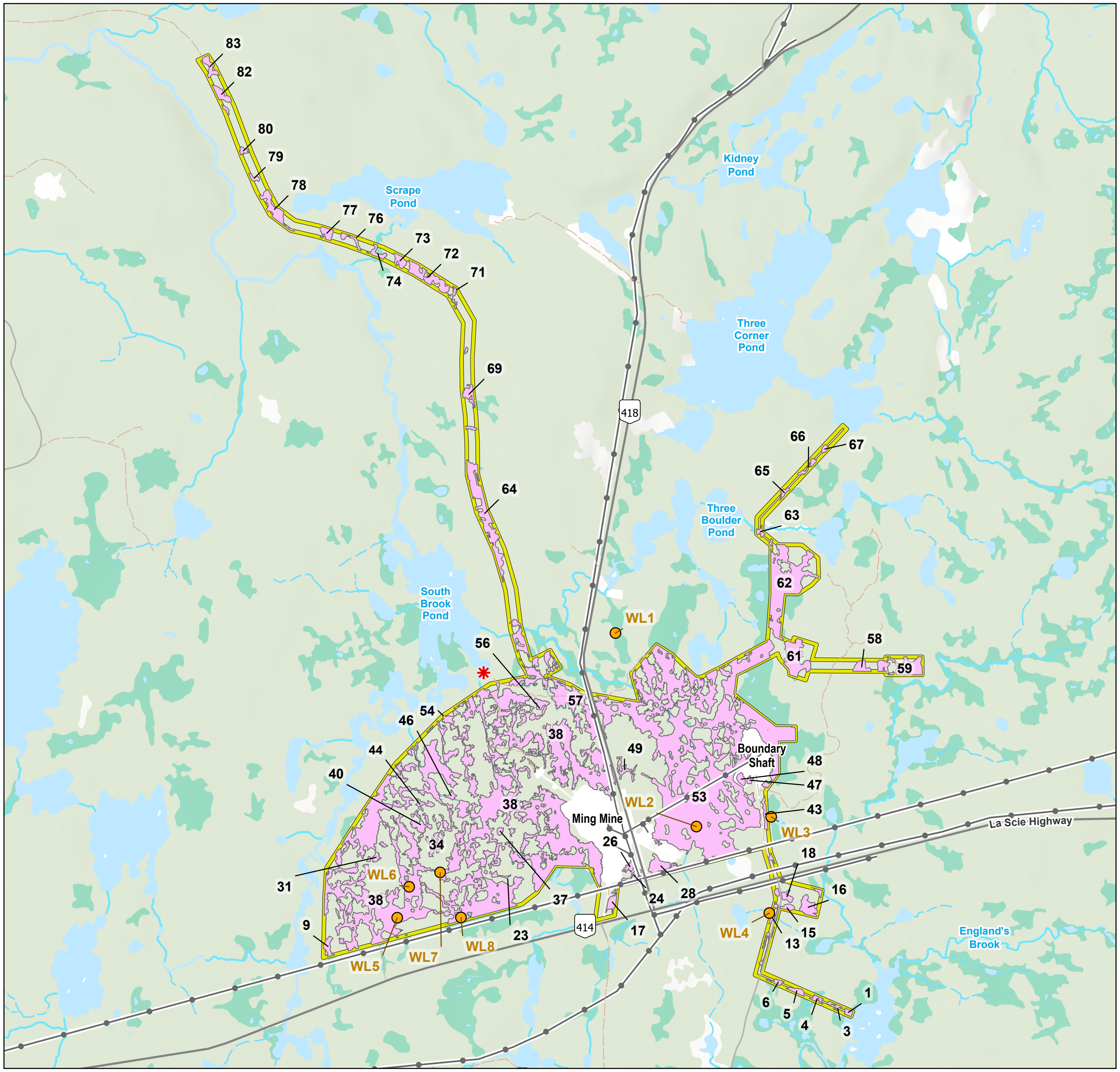

Figure No.
3.2

Title
Interpreted Wetland Boundaries within the Project Area

Client/Project
FireFly Metals Ltd
Green Bay Ming Mine Project
121418199_6_005

Project Location
Baie Verte, NL
Prepared by MB on 2025-03-18

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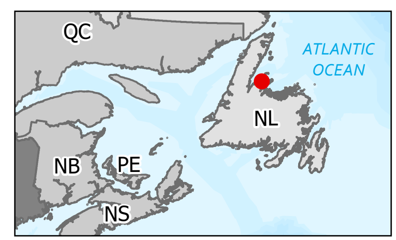
0 400 800
Metres
(At original document size of 8.5x11)
1:33,000

- Project Area
- Wetland Functional Assessment Location
- Final Discharge Point (FDP)
- Interpreted Wetland
- Dam
- Highway
- Arterial / Collector
- Resource Road / Trail
- Powerline
- Indeterminate Stream
- Intermittent Watercourse
- Definite Watercourse
- Waterbody
- Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

V:\1214\active\121418199\03_data\gis_cad\gis_data\mapping\aprx\3_121418199_FFM_2024Field_OtherReporting\121418199_FFM_GreenBayCuAu_FieldReporting_Terrestrial.aprx Revised: 2025-03-28 By: mblackwood

Many of the portions of wetlands assessed for function within the Project Area are part of expansive peatlands that are common in the area. These wetlands tend to have Higher function ratings for a number of ecological / habitat functions that fall within the Aquatic Habitat and Transition Habitat groups, including Waterbird Feeding Habitat, Waterbird Nesting Habitat, Raptor and Wetland Songbird Habitat, Keystone Mammal Habitat, and Pollinator Habitat. Assessed wetlands also commonly have Higher ratings in Phosphorus Retention and Organic Nutrient Export functions. All assessed wetlands had Lower function ratings for Anadromous Fish Habitat and Resident and Other Fish Habitat. The function scores and ratings of assessed wetlands are not unexpected for the classes, forms, types, and sizes of wetlands in the area.

Some portions of the Project Area, particularly wetland areas downstream of the Rambler Historic Tailings Area and the Boundary Shaft area, have been impacted by past mining activities. In those areas, there are few plants currently growing, but the historical impact appears localized, as nearby vegetation communities appear visually unaffected. However, it is assumed that the wetlands in these areas may provide different levels of function than assessed wetlands which are in relatively unaffected areas

3.4 Wetland Interpretation

Within the Project Area, a total of 137.4 ha of wetland was interpreted, representing 44% of the Project Area (Figure 3.2); provincially mapped wetlands account for 11.7%. Many of the interpreted wetlands continue outside of the Project Area. Because of the large number and density of wetlands, only those wetland polygons with an area greater than 0.1 ha are labelled on Figure 3.2. Interpreted wetlands were merged with provincial land cover information (i.e., forest and non-forest spatial data) (Table 3.4). Some land use types listed in Table 3.4 exist in relatively small amounts (e.g., mixedwood stands) and may not have been encountered, which is why not all listed land use types are described in Section 3.2.1.

Table 3.4 Land Cover Types within the Project Area

Land Cover Type	Area within Project Area	
	ha	% of total
Wooded		
Coniferous Scrub	56.26	18.10
Deciduous Scrub	0.50	0.16
Mixedwood - Immature	10.38	3.34
Mixedwood - Semi-mature	0.17	0.05
Mixedwood - Over-mature	0.57	0.18
Softwood - Regenerating	12.48	4.01
Softwood - Immature	30.00	9.65
Softwood - Semi-mature	9.87	3.17
Softwood - Mature	3.46	1.11
Softwood - Over-mature	14.52	4.67
Softwood - Uneven aged	0.37	0.12

Table 3.4 Land Cover Types within the Project Area

Land Cover Type	Area within Project Area	
	ha	**% of total**
Unknown Forest	3.92	1.26
Unclassified Upland[1]	2.77	0.89
Wetlands / Waterbodies		
Wetland – Interpreted	137.41	44.20
Water	0.06	0.02
Disturbed		
Past Disturbance - Harvest		
Road Corridor	3.41	1.10
Transmission Line Corridor	1.95	0.63
Cleared Land	17.23	5.54
Total	**310.91**	100

Note:
[1] Unclassified upland refers to areas included in provincially mapped wetlands that were not included in interpreted wetland boundaries, and are thus assumed to be upland.

4 Summary

Vegetation surveys conducted within the Project Area and surrounding areas identified 230 vascular plant species or genera. No vascular plant SAR were observed. Three vascular plant SOCC were observed including slender cotton-grass (*Eriophorum gracile*, S1S2), wild calla (*Calla palustris*, S2S3), and bog willow (*Salix pedicellaris*, S2S3). Due to ongoing changes to the Project Area boundary, only one of the vascular plant SOCC (bog willow) was observed within the Project Area.

Wetland functions were assessed for eight portions of wetlands within the Project Area. Higher function ratings for many habitat-based or ecological functions were common, as were higher function ratings for Phosphorus Retention and Organic Nutrient Export. Function was not assessed within portions of wetlands visibly affected by historic mining activities. Function in these areas may differ from assessed areas.

Wetland interpretation resulted in 137.41 ha of wetland within the Project Area, representing 44.2% of the Project Area. This is an increase from 11.7% of the Project Area represented by provincially mapped wetlands.

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Appendices

Appendix A Vascular Plants Observed During Field Surveys

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Abies balsamea	balsam fir	S5
Acer spicatum	mountain maple	S5
Agrostis capillaris	colonial bentgrass	SNA
Agrostis gigantea	black bentgrass	SNA
Agrostis scabra	rough bentgrass	S5
Agrostis stolonifera	spreading bentgrass	SNA
Alchemilla sp.	a lady's-mantle	-
Alnus alnobetula	green alder	S5
Alnus incana	speckled alder	S5
Amelanchier bartramiana	Bartram shadbush	S5
Anaphalis margaritacea	pearly everlasting	S5
Andromeda polifolia	bog rosemary	S5
Anthoxanthum odoratum	sweet vernal grass	SNA
Apocynum androsaemifolium	spreading dogbane	S3
Aralia hispida	bristly sarsaparilla	S3S4
Aralia nudicaulis	wild sarsaparilla	S5
Athyrium filix-femina	lady-fern	S5
Avenella flexuosa	wavy hairgrass	S5
Betula cordifolia	heartleaf birch, mountain white birch	S4S5
Betula michauxii	Newfoundland dwarf birch	S5
Betula papyrifera	paper birch	S5
Betula pumila	swamp birch	S5
Bromus ciliatus	fringed brome	S5
Calamagrostis canadensis	blue-joint reedgrass	S5
Calamagrostis pickeringii	Pickering's reed bent-grass	S5
Calla palustris	**wild calla**	**S2S3**
Carex brunnescens	brownish sedge	S5
Carex buxbaumii	Buxbaum's sedge	S4S5
Carex canescens	hoary sedge	S5
Carex crawfordii	Crawford sedge	S4S5
Carex deflexa	short-stemmed sedge	S4S5
Carex disperma	softleaf sedge	S4S5
Carex echinata	little prickly sedge	S5
Carex exilis	coast sedge	S5
Carex flava	yellow sedge	S4S5

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Carex lasiocarpa	slender sedge	S5
Carex leptalea	bristly-stalk sedge	S4S5
Carex leptonervia	finely-nerved sedge	S4S5
Carex limosa	mud sedge	S5
Carex livida	livid sedge	S5
Carex magellanica	boreal bog sedge	S5
Carex michauxiana	Michaux sedge	S4S5
Carex oligosperma	few-seeded sedge	S5
Carex pauciflora	few-flowered sedge	S4S5
Carex projecta	necklace sedge	S3
Carex rostrata	beaked sedge	S3S4
Carex saxatilis	russet sedge	S4S5
Carex stipata	stalk-grain sedge	S4S5
Carex trisperma	three-seed sedge	S5
Carex utriculata	bear sedge	S4S5
Carex vaginata	sheathed sedge	S3S4
Carex vesicaria	inflated sedge	S4S5
Carex viridula	little green sedge	S5
Carex wiegandii	Wiegand's sedge	S3
Chamaedaphne calyculata	leatherleaf	S5
Chamerion angustifolium	fireweed	S5
Cinna latifolia	slender wood reedgrass	S5
Circaea alpina	small enchanter's nightshade	S5
Clintonia borealis	Clinton lily	S5
Conioselinum chinense	hemlock parsley	S5
Coptis trifolia	goldthread	S5
Corallorhiza maculata	spotted coralroot	S3S4
Cornus canadensis	dwarf dogwood	S5
Cornus sericea subsp. *sericea*	red osier dogwood	S5
Cypripedium acaule	pink lady's-slipper	S4
Danthonia spicata	poverty oat-grass	S5
Dasiphora fruticosa	golden-hardhack	S4S5
Doellingeria umbellata	parasol white-top	S5
Drosera intermedia	spoon-leaved sundew	S4S5
Drosera rotundifolia	roundleaf sundew	S5

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Dryopteris campyloptera	mountain wood-fern	S5
Dryopteris cristata	crested wood fern	S3S4
Dryopteris intermedia	glandular wood fern	S5
Empetrum nigrum	black crowberry	S5
Endotropis alnifolia	alderleaf buckthorn	S5
Epilobium ciliatum	hairy willow-herb	S5
Epilobium leptophyllum	linear-leaved willow-herb	S3
Epilobium palustre	marsh willow-herb	S5
Equisetum arvense	field horsetail	S5
Equisetum fluviatile	water horsetail	S4
Equisetum sylvaticum	woodland horsetail	S5
Eriocaulon aquaticum	seven-angled pipewort	S5
Eriophorum angustifolium	narrow-leaved cotton-grass	S4S5
Eriophorum gracile	**slender cotton-grass**	**S1S2**
Eriophorum russeolum	russet cotton-grass	S3
Eriophorum virginicum	tawny cotton-grass	S4S5
Eriophorum viridicarinatum	green keeled cottongrass	S4S5
Euphrasia nemorosa	common eyebright	S4S5
Eurybia radula	rough-leaved aster	S5
Euthamia graminifolia	flat-top fragrant-golden-rod	S5
Fragaria virginiana	Virginia strawberry	S5
Galium triflorum	sweet-scent bedstraw	S5
Gaultheria hispidula	creeping snowberry	S5
Geocaulon lividum	northern comandra	S5
Geum rivale	purple avens	S4S5
Glyceria borealis	small floating manna-grass	S4S5
Glyceria canadensis	Canada manna-grass	S5
Glyceria striata	fowl manna-grass	S5
Gymnocarpium dryopteris	northern oak fern	S5
Heracleum maximum	cow parsnip	S5
Hieracium umbellatum	umbellate hawkweed	S4
Hippuris vulgaris	common mare's-tail	S4S5
Hypericum canadense	Canadian St. John's-wort	S4
Ilex mucronata	mountain holly	S5
Iris versicolor	blueflag	S5

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Juncus alpinoarticulatus	a rush	S3S4
Juncus articulatus	jointed rush	S5
Juncus effusus	soft rush	S5
Juncus stygius subsp. *americanus*	American Moor Rush	S3S4
Juncus tweedyi	narrow-panicled rush	S5
Juniperus communis	ground juniper	S5
Juniperus horizontalis	creeping juniper	S5
Kalmia angustifolia	sheep-laurel	S5
Kalmia polifolia	pale laurel	S5
Larix laricina	American larch	S5
Leucanthemum vulgare	oxeye daisy	SNA
Linnaea borealis	twinflower	S5
Lobelia dortmanna	water lobelia	S5
Lonicera villosa	mountain fly-honeysuckle	S5
Luzula multiflora	common woodrush	S5
Lycopodiella inundata	bog clubmoss	S5
Lycopodium clavatum	running pine	S5
Lycopus uniflorus	northern bugleweed	S5
Lysimachia borealis	northern starflower	S5
Maianthemum canadense	wild lily-of-the-valley	S5
Maianthemum trifolium	three-leaf Solomon's-plume	S5
Malaxis unifolia	green adder's-mouth	S3
Matricaria discoidea	pineapple-weed chamomile	SNA
Menyanthes trifoliata	bog buckbean	S5
Mitella nuda	naked bishop's-cap	S5
Moneses uniflora	one-flower wintergreen	S5
Monotropa uniflora	ghost pipe	S5
Muhlenbergia glomerata	marsh muhly	S3S4
Myrica gale	sweet bayberry	S5
Nabalus trifoliolatus	three leaf rattlesnake-root	S5
Nuphar variegata	yellow cowlily	S5
Oclemena nemoralis	bog aster	S5
Omalotheca sylvatica	woodland cudweed	S3S4
Onoclea sensibilis	sensitive fern	S4S5
Orthilia secunda	one-sided wintergreen	S5

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Osmunda claytoniana	interrupted fern	S4
Osmundastrum cinnamomeum	cinnamon fern	S5
Packera aurea	golden groundsel	S3S4
Packera paupercula	balsam groundsel	S4
Pedicularis palustris subsp. *palustris*	purple lousewort	S3S4
Phalaris arundinacea	reed canary grass	SNA
Phegopteris connectilis	northern beech fern	S5
Phleum pratense	meadow timothy	SNA
Picea mariana	black spruce	S5
Pilosella aurantiaca	orange hawkweed	SNA
Plantago major	nipple-seed plantain	SNA
Platanthera aquilonis	leafy northern green orchis	S4
Platanthera blephariglottis	white fringed orchid	S4
Platanthera clavellata	club-spur orchid	S5
Platanthera dilatata	leafy white orchid	S5
Platanthera huronensis	green orchid	S4
Platanthera psycodes	small purple fringed orchid	S4S5
Poa compressa	Canada bluegrass	SNA
Pogonia ophioglossoides	snakemouth	S4
Polystichum braunii	braun's holly-fern	S3S4
Populus tremuloides	quaking aspen	S4S5
Potamogeton gramineus	grassy pondweed	S5
Potamogeton sp.	a pondweed	-
Prunella vulgaris	self-heal	S3S5
Prunus pensylvanica	fire cherry	S4S5
Pteridium aquilinum	bracken	S4S5
Pyrola americana	American wintergreen	S3S4
Ranunculus acris	tall butter-cup	SNA
Ranunculus flammula var. *reptans*	lesser spearwort	S5
Ranunculus repens	creeping butter-cup	SNA
Rhinanthus minor	little yellow-rattle	S3
Rhododendron canadense	rhodora	S5
Rhododendron groenlandicum	common Labrador-tea	S5
Rhynchospora alba	white beakrush	S4S5
Rhynchospora fusca	brown beakrush	S3S4

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Ribes glandulosum	skunk currant	S5
Ribes hirtellum	smooth gooseberry	S3S4
Ribes lacustre	bristly black currant	S4
Rosa nitida	shining rose	S4S5
Rubus arcticus	northern blackberry	S3S4
Rubus chamaemorus	cloudberry	S5
Rubus idaeus subsp. *strigosus*	wild red raspberry	S5
Rubus pubescens	dwarf red raspberry	S5
Salix bebbiana	Bebb's willow	S5
Salix discolor	pussy willow	S5
Salix eriocephala	heart-leaved willow	S3
Salix lucida	shining willow	S5
Salix pedicellaris	**bog willow**	**S2S3**
Salix pyrifolia	balsam willow	S4
Salix sp.	a willow	-
Sanguisorba canadensis	Canada burnet	S5
Sarracenia purpurea	northern pitcher-plant	S5
Scheuchzeria palustris	pod grass	S3S4
Schoenoplectus subterminalis	water bulrush	S3
Scirpus atrocinctus	black-girdle bulrush	S5
Scirpus microcarpus	small-fruit bulrush	S4S5
Scorzoneroides autumnalis	autumn hawkbit	SNA
Solidago brendae	Brenda's goldenrod	S3
Solidago macrophylla	large-leaf goldenrod	S5
Solidago rugosa	rough-leaf goldenrod	S5
Solidago uliginosa	bog goldenrod	S5
Sorbus americana	American mountain-ash	S4S5
Sorbus decora	northern mountain-ash	S5
Sparganium acaule	green-fruited burreed	S4
Spinulum annotinum	stiff clubmoss	S5
Spiranthes romanzoffiana	hooded ladies'-tresses	S4S5
Symphyotrichum puniceum	swamp aster	S5
Taxus canadensis	Canadian yew	S3S4
Thalictrum pubescens	tall meadow-rue	S5
Triadenum fraseri	marsh St. John's-wort	S5

Table A.1 Vascular Plants Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank[1]
Triantha glutinosa	sticky false-asphodel	S5
Trichophorum alpinum	alpine cotton-grass	S4S5
Trichophorum cespitosum	deergrass	S5
Trifolium aureum	yellow clover	SNA
Trifolium pratense	red clover	SNA
Trifolium repens	white clover	SNA
Triglochin maritima	common bog arrow-grass	S5
Triglochin palustris	slender bog arrow-grass	S4S5
Tussilago farfara	colt's-foot	SNA
Typha latifolia	broad-leaf cattail	SNA
Utricularia cornuta	horned bladderwort	S5
Utricularia intermedia	flatleaf bladderwort	S5
Vaccinium angustifolium	late lowbush blueberry	S5
Vaccinium boreale	northern blueberry	S4S5
Vaccinium oxycoccos	small cranberry	S5
Vaccinium vitis-idaea	mountain cranberry	S5
Viburnum cassinoides	northern wild raisin	S5
Viburnum edule	squashberry	S5
Vicia cracca	tufted vetch	SNA
Viola sp.	a violet	-

Note: SOCC are in bold font.

[1] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = Apparently Secure, S5 = Secure, S#S# = range of uncertainty about the status (AC CDC 2023, 2025).

Appendix B Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC) Data

Table B.1 Functional Assessment Score for Wetland FA 1

Wetland FA ID:	WL1	Observer:	H. Button
Date:	Sept. 17, 2024	Latitude & Longitude:	49.923728 N,56.084634 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Surface Water Storage (WS)	1.91	Lower	1.39	Lower
Stream Flow & Temperature Support (SFTS)	6.78	Higher	6.33	Higher
Sediment & Toxicant Retention & Stabilisation (SR)	2.60	Lower	12.07	Higher
Phosphorus Retention (PR)	6.69	Higher	10.00	Higher
Nitrate Removal & Retention (NR)	1.99	Lower	10.00	Higher
Wildfire Resistance (WFR)	1.94	Lower	0.00	Lower
Carbon Stock Preservation (CSP)	4.98	Moderate		
Carbon Capture (CC)	5.44	Moderate		
Organic Nutrient Export (OE)	8.38	Higher		
Aquatic Primary Productivity (APP)	4.12	Moderate	4.41	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	8.91	Higher	6.67	Higher
Waterbird Nesting Habitat (WBN)	8.60	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.33	Higher	10.00	Higher
Keystone Mammal Habitat (KMH)	12.92	Higher	10.00	Higher
Native Plant Habitat (PH)	5.24	Moderate	5.72	Moderate
Pollinator Habitat (POL)	9.20	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.30	Lower
Wetland Sensitivity (Sens)			3.75	Moderate
Wetland Stressors (STR)			1.47	Lower

Table B.1 Functional Assessment Score for Wetland FA 1

Wetland FA ID:	**WL1**	**Observer:**	**H. Button**	
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.923728 N,56.084634 W	
Results for this Assessment Area (AA):				
Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	1.91	Lower	1.39	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.38	Higher	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	7.40	Higher	5.85	Higher
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	6.64	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.39	Higher	8.73	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.2 Functional Assessment Score for Wetland FA 2

Wetland FA ID:	**WL2**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.914089 N,56.078602 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Surface Water Storage (WS)	4.20	Moderate	1.53	Lower
Stream Flow & Temperature Support (SFTS)	3.72	Moderate	3.39	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	2.02	Lower	12.07	Higher
Phosphorus Retention (PR)	5.17	Moderate	10.00	Higher
Nitrate Removal & Retention (NR)	1.05	Lower	10.00	Higher
Wildfire Resistance (WFR)	3.44	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	6.45	Moderate		
Carbon Capture (CC)	2.93	Lower		
Organic Nutrient Export (OE)	9.38	Higher		
Aquatic Primary Productivity (APP)	2.19	Lower	4.53	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	5.93	Moderate	6.67	Higher
Waterbird Nesting Habitat (WBN)	7.69	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	7.95	Higher	4.06	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	3.33	Moderate
Native Plant Habitat (PH)	6.51	Moderate	5.68	Moderate
Pollinator Habitat (POL)	9.33	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.16	Lower
Wetland Sensitivity (Sens)			4.14	Moderate
Wetland Stressors (STR)			2.71	Lower

Table B.2 Functional Assessment Score for Wetland FA 2

Wetland FA ID:	WL2	Observer:	H. Button
Date:	Sept. 17, 2024	Latitude & Longitude:	49.914089 N,56.078602 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	4.20	Moderate	1.53	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.06	Moderate	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	7.24	Higher	4.25	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	5.55	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.63	Higher	6.07	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.3 Functional Assessment Score for Wetland FA 3

Wetland FA ID:	WL3	Observer:	H. Button
Date:	Sept. 17, 2024	Latitude & Longitude:	49.914527 N,56.072852 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Surface Water Storage (WS)	5.39	Moderate	2.72	Moderate
Stream Flow & Temperature Support (SFTS)	3.47	Moderate	3.43	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	3.19	Lower	12.07	Higher
Phosphorus Retention (PR)	8.16	Higher	10.00	Higher
Nitrate Removal & Retention (NR)	1.47	Lower	10.00	Higher
Wildfire Resistance (WFR)	5.41	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	6.63	Moderate		
Carbon Capture (CC)	3.25	Lower		
Organic Nutrient Export (OE)	9.39	Higher		
Aquatic Primary Productivity (APP)	3.75	Lower	4.75	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	8.05	Higher	5.00	Moderate
Waterbird Nesting Habitat (WBN)	7.82	Higher	5.00	Moderate
Raptor & Wetland Songbird Habitat (RSB)	8.40	Higher	1.20	Lower
Keystone Mammal Habitat (KMH)	12.92	Higher	3.33	Moderate
Native Plant Habitat (PH)	6.73	Moderate	10.00	Higher
Pollinator Habitat (POL)	9.47	Higher	10.00	Higher
Cultural & Recreational Importance (CRI)			0.26	Lower
Wetland Sensitivity (Sens)			4.98	Moderate
Wetland Stressors (STR)			3.53	Moderate

Table B.3 Functional Assessment Score for Wetland FA 3

Wetland FA ID:	**WL3**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.914527 N,56.072852 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	5.39	Moderate	2.72	Moderate
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	6.51	Higher	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	7.46	Higher	4.42	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	6.01	Higher	3.75	Moderate
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.84	Higher	8.53	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.4 Functional Assessment Score for Wetland FA 4

Wetland FA ID:	WL4	Observer:	H. Button
Date:	Sept. 17, 2024	Latitude & Longitude:	49.909759 N,56.073087 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Surface Water Storage (WS)	4.49	Moderate	1.45	Lower
Stream Flow & Temperature Support (SFTS)	4.20	Moderate	2.91	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	3.33	Lower	5.87	Moderate
Phosphorus Retention (PR)	6.47	Higher	4.76	Higher
Nitrate Removal & Retention (NR)	1.59	Lower	10.00	Higher
Wildfire Resistance (WFR)	6.02	Higher	0.00	Lower
Carbon Stock Preservation (CSP)	5.83	Moderate		
Carbon Capture (CC)	3.87	Moderate		
Organic Nutrient Export (OE)	8.61	Higher		
Aquatic Primary Productivity (APP)	3.54	Lower	4.74	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	7.49	Higher	6.67	Higher
Waterbird Nesting Habitat (WBN)	8.40	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.44	Higher	3.85	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	0.00	Lower
Native Plant Habitat (PH)	6.07	Moderate	5.74	Moderate
Pollinator Habitat (POL)	9.25	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.23	Lower
Wetland Sensitivity (Sens)			3.74	Moderate
Wetland Stressors (STR)			2.04	Lower

Table B.4 Functional Assessment Score for Wetland FA 4

Wetland FA ID:	**WL4**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.909759 N,56.073087 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	4.49	Moderate	1.45	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.39	Higher	8.44	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	7.03	Higher	4.28	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	6.19	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.58	Higher	6.04	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.5 Functional Assessment Score for Wetland FA 5

Wetland FA ID:	WL5	Observer:	H. Button	
Date:	Sept. 17, 2024	Latitude & Longitude:	49.909753 N,56.101651 W	
Results for this Assessment Area (AA):				
Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Surface Water Storage (WS)	5.05	Moderate	1.38	Lower
Stream Flow & Temperature Support (SFTS)	3.34	Moderate	1.95	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	2.36	Lower	12.07	Higher
Phosphorus Retention (PR)	6.15	Higher	10.00	Higher
Nitrate Removal & Retention (NR)	1.28	Lower	10.00	Higher
Wildfire Resistance (WFR)	2.30	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	6.84	Moderate		
Carbon Capture (CC)	3.57	Moderate		
Organic Nutrient Export (OE)	8.44	Higher		
Aquatic Primary Productivity (APP)	3.51	Lower	4.09	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	6.36	Moderate	6.67	Higher
Waterbird Nesting Habitat (WBN)	8.14	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.21	Higher	4.31	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	10.00	Higher
Native Plant Habitat (PH)	6.46	Moderate	5.84	Moderate
Pollinator Habitat (POL)	9.11	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.18	Lower
Wetland Sensitivity (Sens)			4.30	Moderate
Wetland Stressors (STR)			1.80	Lower

Table B.5 Functional Assessment Score for Wetland FA 5

Wetland FA ID:	**WL5**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.909753 N,56.101651 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	5.05	Moderate	1.38	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.50	Higher	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	6.77	Higher	3.56	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	5.88	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.52	Higher	6.13	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.6 Functional Assessment Score for Wetland FA 6

Wetland FA ID:	**WL6**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.911278 N,56.100703 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Surface Water Storage (WS)	5.05	Moderate	1.38	Lower
Stream Flow & Temperature Support (SFTS)	3.34	Moderate	3.17	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	2.36	Lower	12.07	Higher
Phosphorus Retention (PR)	6.15	Higher	10.00	Higher
Nitrate Removal & Retention (NR)	1.83	Lower	10.00	Higher
Wildfire Resistance (WFR)	2.30	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	6.77	Moderate		
Carbon Capture (CC)	4.21	Moderate		
Organic Nutrient Export (OE)	8.39	Higher		
Aquatic Primary Productivity (APP)	4.21	Moderate	4.26	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	6.39	Moderate	6.67	Higher
Waterbird Nesting Habitat (WBN)	8.23	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.24	Higher	4.10	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	3.33	Moderate
Native Plant Habitat (PH)	6.19	Moderate	5.84	Moderate
Pollinator Habitat (POL)	9.11	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.18	Lower
Wetland Sensitivity (Sens)			3.56	Moderate
Wetland Stressors (STR)			1.80	Lower

Table B.6 Functional Assessment Score for Wetland FA 6

Wetland FA ID:	**WL6**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.911278 N,56.100703 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	5.05	Moderate	1.38	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.52	Higher	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	6.85	Higher	3.99	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	5.94	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.48	Higher	6.10	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.7 Functional Assessment Score for Wetland FA 7

Wetland FA ID:	WL7	Observer:	H. Button
Date:	Sept. 17, 2024	Latitude & Longitude:	49.911974 N,56.098312 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Surface Water Storage (WS)	5.05	Moderate	1.41	Lower
Stream Flow & Temperature Support (SFTS)	3.53	Moderate	1.93	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	0.92	Lower	12.07	Higher
Phosphorus Retention (PR)	6.22	Higher	10.00	Higher
Nitrate Removal & Retention (NR)	1.63	Lower	10.00	Higher
Wildfire Resistance (WFR)	2.65	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	7.20	Higher		
Carbon Capture (CC)	2.22	Lower		
Organic Nutrient Export (OE)	7.98	Moderate		
Aquatic Primary Productivity (APP)	1.59	Lower	4.09	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	5.22	Moderate	6.67	Higher
Waterbird Nesting Habitat (WBN)	7.14	Moderate	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.16	Higher	4.10	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	3.33	Moderate
Native Plant Habitat (PH)	8.22	Higher	5.84	Moderate
Pollinator Habitat (POL)	9.18	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.79	Lower
Wetland Sensitivity (Sens)			3.79	Moderate
Wetland Stressors (STR)			2.30	Lower

Table B.7 Functional Assessment Score for Wetland FA 7

Wetland FA ID:	**WL7**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.911974 N,56.098312 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	Function Score (norm.)	Function Rating	Benefits Score (norm.)	Benefits Rating
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	5.05	Moderate	1.41	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	5.60	Higher	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	6.17	Moderate	3.55	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	5.11	Moderate	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.85	Higher	6.10	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Table B.8 Functional Assessment Score for Wetland FA 8

Wetland FA ID:	**WL8**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.909726 N,56.096757 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Surface Water Storage (WS)	1.62	Lower	1.45	Lower
Stream Flow & Temperature Support (SFTS)	6.72	Higher	3.85	Moderate
Sediment & Toxicant Retention & Stabilisation (SR)	2.02	Lower	12.07	Higher
Phosphorus Retention (PR)	5.50	Moderate	10.00	Higher
Nitrate Removal & Retention (NR)	0.64	Lower	10.00	Higher
Wildfire Resistance (WFR)	2.70	Moderate	0.00	Lower
Carbon Stock Preservation (CSP)	5.52	Moderate		
Carbon Capture (CC)	4.29	Moderate		
Organic Nutrient Export (OE)	9.39	Higher		
Aquatic Primary Productivity (APP)	3.68	Lower	4.22	Moderate
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Amphibian Habitat (AM)	-	-	-	-
Waterbird Feeding Habitat (WBF)	5.86	Moderate	6.67	Higher
Waterbird Nesting Habitat (WBN)	7.79	Higher	6.67	Higher
Raptor & Wetland Songbird Habitat (RSB)	8.02	Higher	4.54	Moderate
Keystone Mammal Habitat (KMH)	12.92	Higher	10.00	Higher
Native Plant Habitat (PH)	7.00	Higher	5.90	Moderate
Pollinator Habitat (POL)	9.16	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			0.82	Lower
Wetland Sensitivity (Sens)			5.13	Moderate
Wetland Stressors (STR)			6.18	Moderate

Table B.8 Functional Assessment Score for Wetland FA 8

Wetland FA ID:	**WL8**	**Observer:**	**H. Button**
Date:	**Sept. 17, 2024**	**Latitude & Longitude:**	49.909726 N,56.096757 W

Results for this Assessment Area (AA):

Wetland Functions or Other Attributes:	**Function Score (norm.)**	**Function Rating**	**Benefits Score (norm.)**	**Benefits Rating**
Summary Ratings for Grouped Functions:				
HYDROLOGIC (HYg) (WS)	1.62	Lower	1.45	Lower
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	4.47	Moderate	11.38	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	7.99	Higher	4.13	Moderate
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	5.60	Higher	5.00	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	8.61	Higher	6.19	Higher

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means that this wetland has equal or less capacity than the lowest-scoring one, for that function or attribute, from among the calibration wetlands that were assessed previously in its region during development of this WESP-AC.

The Normalised Score column presents the numeric score of a function or attribute after the raw score has been mathematically adjusted (normalised) to a full 0-10 scale, based on minimum and maximum scores from among the calibration sites. See the Manual for a description of the normalisation process. A normalised score greater than 10 indicates a wetland's raw function or benefit score was greater than that of any of the calibration wetlands. A normalised score less than 0 indicates a wetland's raw function or benefit score was less than that of any of the calibration wetlands.

The Rating column indicates which of three rating categories (Lower, Moderate, Higher) each normalised score is assigned to. Ratings convey the relative meaning of the numeric score and allow for comparison across different functions or attributes. The score thresholds that determine the ratings differ for each row, as based on the distribution of scores for that function or attribute from among all the calibration wetlands. See the Manual for a description of the process.

Appendix 6.E Avifauna Baseline Survey Report

FireFly
METALS

Green Bay Ming Mine Project – 2024 Baseline Avifauna Program

Final Report

March 31, 2025

Prepared for:
FireFly Metals Canada
P.O. Box 610
Baie Verte NL A0K 1B0

Prepared by:
Stantec Consulting Ltd.
141 Kelsey Drive
St. John’s NL A1B 0L2

File Number:
121418199

Limitations and Sign-off

The conclusions in the Report titled Green Bay Ming Mine Project – 2024 Baseline Avifauna Program are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from FireFly Metals Canada Limited (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Executive Summary

FireFly Metals Canada Ltd is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador, Canada. The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district.

To support the development and environmental assessment of the Project, Stantec Consulting Ltd. conducted a Baseline Avifauna Program (BAP) in 2024 to characterize the avian community during the breeding season. The survey aimed to generate an observed species list, assess species abundance, evaluate the presence of Species at Risk (SAR) and Species of Conservation Concern (SOCC), and provide baseline information on habitat use and species distribution.

The BAP included point count surveys, autonomous recording unit surveys, area search surveys, and incidental observations. A total of 58 bird species were documented, including three SAR (Evening Grosbeak [*Coccothraustes vespertinus*], Olive-Sided Flycatcher [*Contopus cooperi*], and Rusty Blackbird [*Euphagus carolinus*]) and two SOCC (Bay-breasted Warbler [*Setophaga castanea*] and Cape May Warbler [*Setophaga tigrina*]). Historical records of these SAR/SOCC exist elsewhere in the region (e.g., citizen science records).

The results of the BAP provide baseline data to inform the environmental assessment and management plans for the Project, related to the avian community in the Project Area.

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Acronyms / Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
ARU	autonomous recording unit
BAP	Baseline Avifauna Program
BBS	Breeding Bird Survey
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
FireFly	FireFly Metals Canada Ltd.
km	kilometre
Hz	Hertz
m	metre
NBBA	Newfoundland Breeding Bird Atlas
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador *Endangered Species Act*
SAR	species at risk
SARA	*Species at Risk Act*
SOCC	species of conservation concern
SOI	signal of interest
Stantec	Stantec Consulting Ltd.
TPD	Tonnes per day
TMF	Tailings Management Facility
WWMP	Wastewater Management Plant

1 Introduction

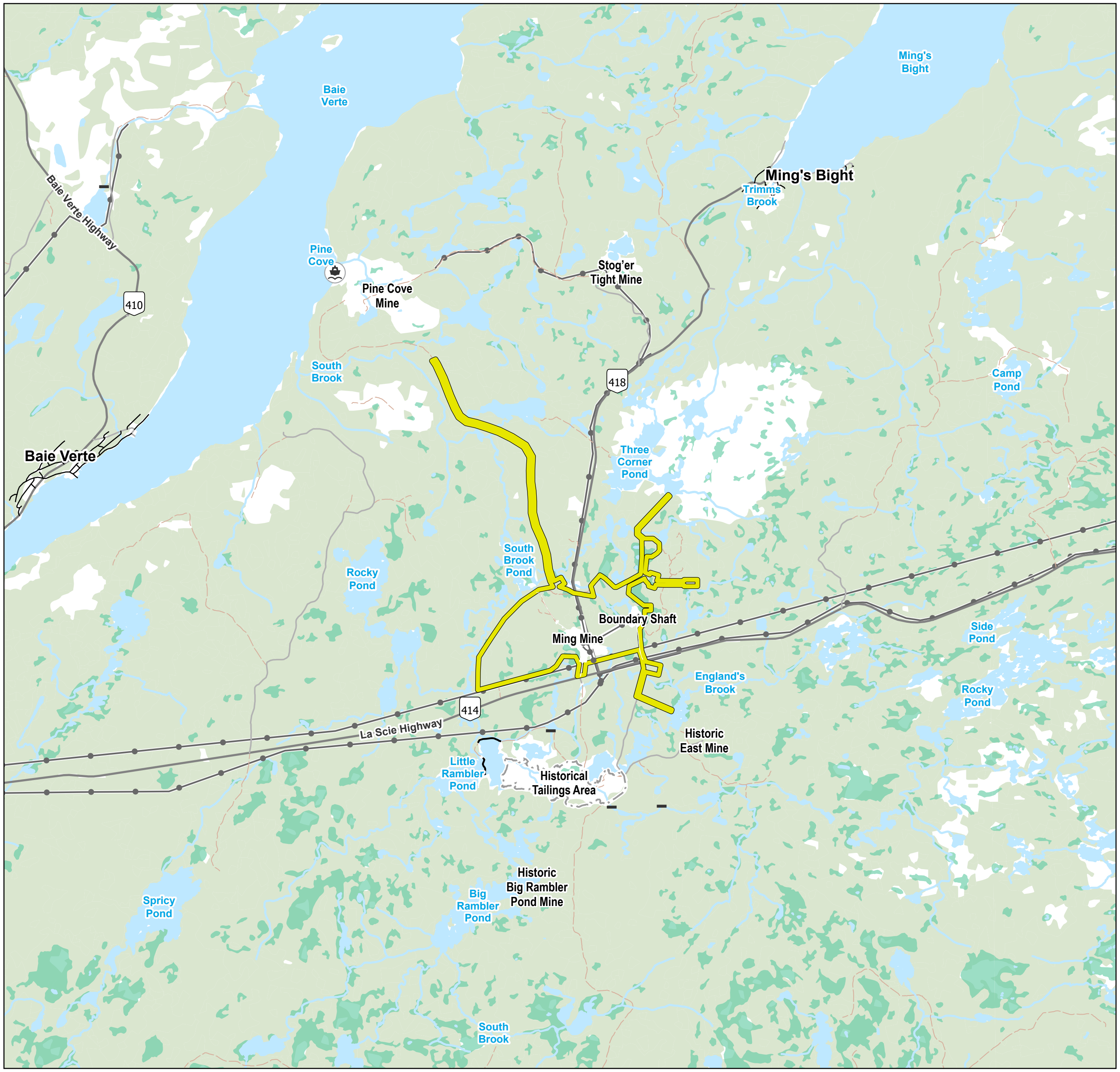
FireFly Metals Canada Ltd (FireFly) is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador (NL), Canada (Figure 1.1). The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district. To support the development and environmental assessment of the Project, Stantec Consulting Ltd. (Stantec) was retained by FireFly to characterize the avian community in the vicinity of the Project. This report summarizes the field methods and results from the 2024 surveys.

Figure No.
1.1
Title
Green Bay Ming Mine Project Location

Client/Project 121418199_008
FireFly Metals Ltd
Green Bay Ming Mine Project

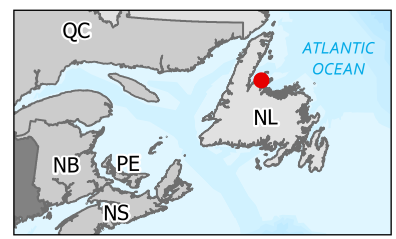
Project Location
Baie Verte, NL

Prepared by MB on 2024-12-09
Revised 2025-03-19
TR by NW on 2025-01-07



N
0 1 2 Kilometres
(At original document size of 8.5x11)
1:90,000

- Project Area
- Port
- Dam
- Highway
- Arterial / Collector
- Local Road
- Resource Road / Trail
- Powerline
- Watercourse
- Waterbody
- Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec,
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

V:\1214\active\121418199\03_data\gis_cad\gis_data\mapping\aprx\3_121418199_FFM_2024Field_OtherReporting\121418199_FFM_GreenBayCuAu_FieldReporting_Terrestrial.aprx Revised: 2025-03-28 By: mblackwood

1.1 2024 Survey Objectives

The objective of the 2024 survey is to establish the baseline characteristics of the avian community in and around the Project during the breeding season. The program consists of both in-person and remote acoustic avian surveys, and specifically aims to satisfy the following:

- Generate an observed species list along with breeding information when evident
- Assess relative abundance of observed species to characterize the overall avian community
- Evaluate the presence of Species at Risk (SAR) and Species of Conservation Concern (SOCC) (see section 3.1.5)
- Provide baseline information on habitat use and species distribution

1.2 Species at Risk and Species of Conservation Concern

For the purposes of this report, SAR include those species designated as Endangered, Threatened, or Special Concern under Schedule 1 of the federal *Species at Risk Act* (SARA) and/or the Newfoundland and Labrador *Endangered Species Act* (NL ESA). SOCC are defined herein as those species that do not meet the definition of SAR, but are ranked S1 (Critically Imperiled), S2 (Imperiled), or combinations thereof (e.g., S1S2) on the Island of Newfoundland by the Atlantic Canada Conservation Data Centre (AC CDC) (AC CDC 2025); by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC); or recommended for listing by the Species Status Advisory Committee as Endangered, Threatened, Vulnerable, or Special Concern but not yet listed under the NL ESA or SARA. Rank definitions for SARA, NL ESA, COSEWIC, and AC CDC can be found in Appendix A.

SAR and SOCC are discussed in Section 4 but are also included in the overall analyses.

2 Methods

2.1 Field Methods

Data for this report were obtained using a combination of targeted point counts, autonomous recording unit (ARU) surveys, and area searches with supplemental data from incidental observations. This combination of methods allows for a more holistic characterization of the avifauna community. Protocols were based on the Canadian Wildlife Service Guidance Regarding Information Needed to Support Assessment of Project Effects on Birds draft document (CWS 2022).

2.1.1 Breeding Bird Point Count Surveys

Point count surveys for breeding birds were completed by two biologists from June 12-14. A total of 29 point counts were completed in locations selected to sample a diversity of habitats in the vicinity of the Project (Table 2.1). Point count locations were spaced a minimum of 300 m apart, and final locations were refined by field staff in consideration of access. Locations are shown on Figure 2.1.

Table 2.1 Survey Effort by Habitat Type in 2024

Habitat Type	# Point Counts	# ARUs	Total Locations
Forested			
Softwood	12	2	14
Mixedwood	3	1	4
Scrub	7	-	7
Unknown	1	-	1
Non-Forested			
Barrens	1	-	1
Disturbed*	3	-	3
Wetland	2	2	4
Total	**29**	**5**	**34**

Note:
* includes naturally disturbed (fire) and anthropogenically disturbed (harvest, development)

At each location, biologists completed a 10-minute point count following a protocol based on a fixed-radius (100 m for forested habitats, 300 m for open habitats) point count sampling procedure (Bibby et al. 2000). Bird species detected by sight or ear during the point count surveys were recorded along with their locations relative to the observer. Surveys began near dawn and continued for approximately four hours. Additional data collected included date and time of survey, weather conditions, and general habitat information. Species detected outside the 100 m radius were recorded as incidental observations.

Surveys were completed during appropriate environmental conditions (light winds and little to no precipitation) when birds are most likely to be singing and can be heard at a distance. Bibby et al. (2000) recommends the restriction of point counts to wind conditions of less than 19 km/hour (Beaufort 3), with a preference for winds under 12 km/h (Beaufort 2) if possible, and to avoid conducting point counts in precipitation exceeding occasional light drizzle or brief showers. The 2024 surveys were conducted during these preferred conditions and detailed environmental data are available in Appendix B.

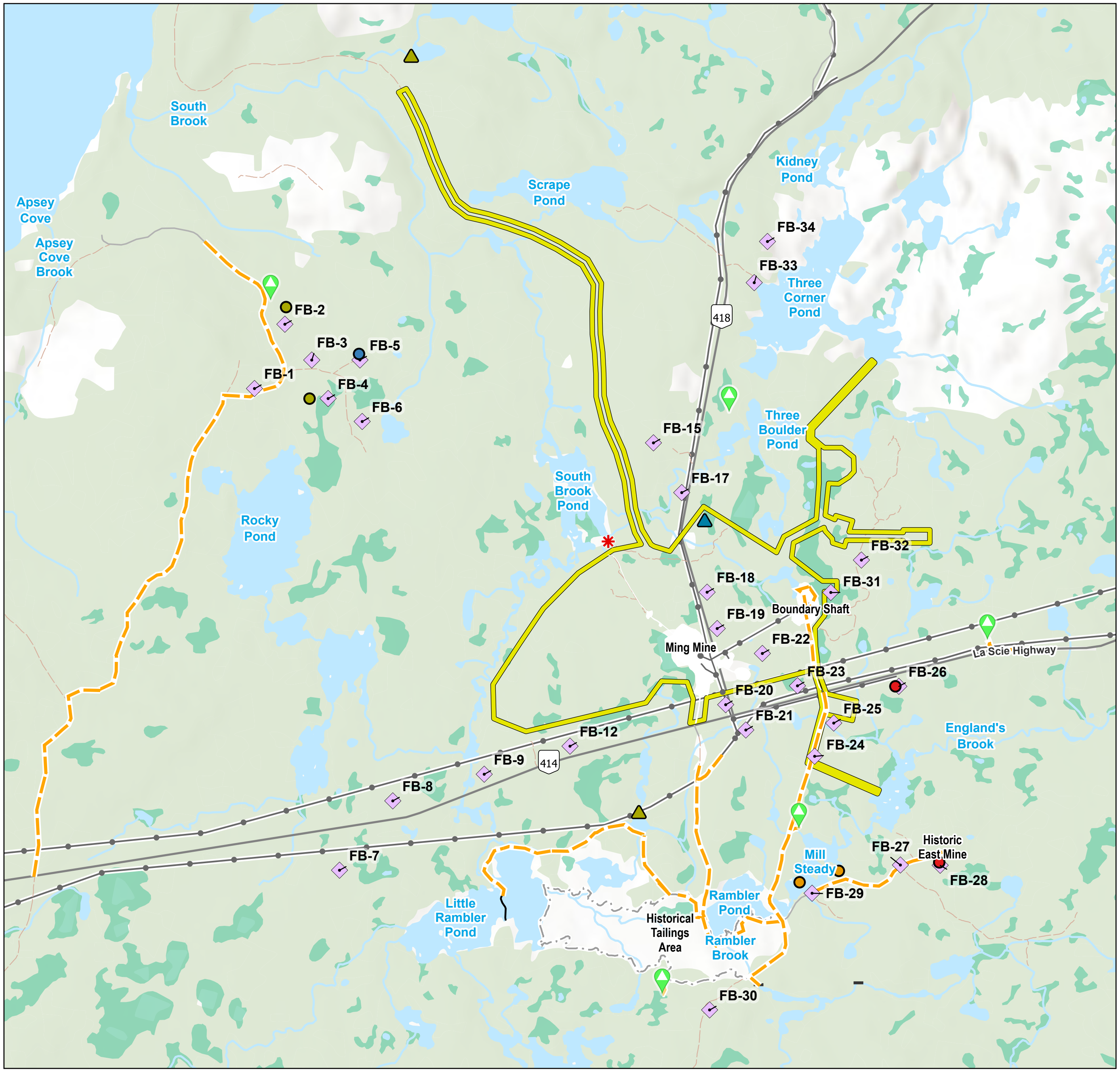


Figure No.
2.1

Title
2024 Survey Locations and Avifauna SAR/SOCC Observations

Client/Project 121418199_3_003
FireFly Metals Ltd
Green Bay Ming Mine Project

Project Location Prepared by MB on 2025-02-12
Baie Verte, NL

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Metres
(At original document size of 8.5x11)
1:45,000

Bird ARU
Breeding Bird Survey Point Count

Species at Risk (SAR) or Species of Conservation Concern (SOCC)

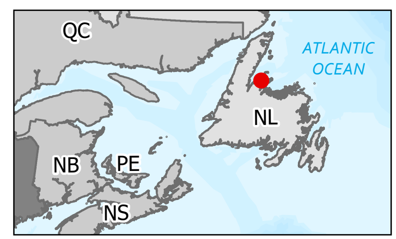
Bay-breasted Warbler
Evening Grosbeak
Olive-sided Flycatcher
Rusty Blackbird

Incidental Observation

Evening Grosbeak
Rusty Blackbird

Area Search Track

Project Area
Final Discharge Point (FDP)
Dam
dam_1
Highway
Arterial / Collector
Resource Road / Trail
Powerline
Watercourse
Waterbody
Wetland
Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec
3. Background: CanVec, GovNL, OpenStreetMap

Stantec

2.1.2 Autonomous Recording Unit Surveys

Five Wildlife Acoustics Song Meter Mini ARUs were deployed to supplement point count survey data. Units were distributed to sample major habitat classes in the vicinity of the Project (i.e., softwood, mixedwood, wetlands; Table 2.1). Each unit is self-contained for sustained deployment and uses its internal battery function and large capacity data storage card. Units were deployed in locations aimed to survey the diversity of habitats in the vicinity of the Project (Table 2.1 above). ARUs were deployed on June 12 and were retrieved June 25. Deployment locations are shown in Figure 2.1, and detailed ARU information is available in Appendix B.

Each ARU was mounted on a tree, approximately 2 metres (m) above the ground, and equipped with an omnidirectional microphone to sample the airspace around the microphone. Surrounding vegetation was removed to reduce acoustic interference. ARUs were programmed to record beginning at 04:00 each day and continued until 10:00. This schedule produced six one-hour files for each unit on each day of deployment, sampling with a gain of 16 decibels (dB), no high-pass filter, 24 kilohertz (kHz) sampling rate, and 1-hour maximum duration per file. Recorded data were saved as compressed .wav files on high-capacity SD cards inside the units.

Photo 1 Example ARU deployment showing ARU affixed to a tree with clutter in the immediate area removed.

2.1.3 Area Search Surveys

To supplement point count and ARU surveys, area search surveys were conducted following morning point counts. These surveys involved qualified biologists walking roadside transects through habitats that are typically underrepresented during traditional surveys (e.g. edge habitats). Tracks can be seen on Figure 2.1.

2.1.4 Incidental Observations

Incidental observations of avifauna were also made during non-avifauna programs (e.g., vegetation (July 27 – Aug 1, 2024) and wetland (Sept 17 – 18, 2024) surveys). Along with species information, the location and date of each observation was recorded. These data were collected opportunistically and are presented in section 3.1.4.

2.2 Data Analysis

2.2.1 Breeding Bird Point Count Surveys

During breeding season, point count survey data were collected electronically through Stantec's in house data application and converted to an Excel file for further data organization and analysis. Species richness (the total number of species detected) was calculated for each point count location and habitat type. Cumulative species richness was also determined for the combined point counts.

2.2.2 Autonomous Recording Unit Surveys

Following current regulatory draft guidance (CWS 2022), a subset of the ARU data was selected for analysis. All ARU data, including data not selected for analysis, was archived for potential future use. Each 1-hour recording was clipped to produce two recordings which included the first five minutes of each half hour. These files were then converted from their compressed form into full spectrum .wav files.

The data was processed using Wildlife Acoustics Kaleidoscope Pro (available online at https://www.wildlifeacoustics.com/products/kaleidoscope-pro) and Cornell Lab's BirdNET acoustic identification program (available online at https://birdnet.cornell.edu/). This tool is an artificial neural network designed to identify bird vocalizations. Recorded call files are defined as signals of interest (SOIs) and not bird vocalizations, because non-bird audio recordings (e.g., amphibian, mammal, and insect noise, equipment noise, splashing or dropping water) may also meet the processing parameters and would be included in the initial analysis results. The BirdNET application provides a highly accurate characterization of the bird species present within acoustic recordings. This is particularly useful for vocalizations that occur in relatively low numbers. These less commonly occurring calls can be difficult to find using only traditional analysis methods because a low volume of a specific set of similar vocalizations may not be apparent when contained within a data set of several million SOIs. BirdNET provides suggested species identifications, including less commonly observed species, resulting in more accurate results. The software is programmed to include SOIs with durations from 0.05 to 3 seconds (s) and with frequency levels between 250 Hertz (Hz) and 12,000 Hz. Once the preliminary analysis was complete, a Stantec biologist experienced with the analysis of acoustic avian calls manually reviewed the SOIs for accuracy using a combination of active listening and a visual comparison to the spectrograms[1] of species that could potentially occur in the area of the Project. SOIs that made it through the preliminary

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[1] A spectrogram is a visual depiction of sound frequencies over time. The main features of a spectrogram are the frequency and amplitude. These parameters create a unique visual representation for each species which can be compared against reference spectrograms.

identification but were determined to not be bird vocalizations through qualitative review were removed from the dataset. Spectrograms of known or likely occurring species available from the Macaulay Library at the Cornell Laboratory of Ornithology at https://www.macaulaylibrary.org, were consulted to verify the species identifications.

BirdNET provides a ranking to each SOI identified during automated classification. The ranking ranges from 0.1 to 1.0, providing a measurement of how likely an SOI is to be the species that the application identifies the vocalization to be. Below a ranking of approximately 0.3, species' classifications typically become less accurate and reliable so a lower limit mask of 0.3 was used to remove false positive identifications from the dataset.

Results of the acoustic monitoring were summarized for each unit and each day of deployment. Results were combined to determine species richness (the total number of species detected) overall for the survey program.

2.2.3 Area Search Surveys

During area search surveys data were collected electronically through Stantec's in house data application and converted to an Excel file for data organization and analysis. Data were organized, but due to the opportunistic and targeted methods of detection, no summary statistics were calculated. Data were used to supplement the overall BAP species list. Data are presented below.

2.2.4 Incidental Observations

Incidental observations were recorded digitally in Stantec's in house data collection application and converted to an Excel file for data organization and analysis. Due to the opportunistic nature of the data, no summary statistics were calculated, however, data were used to inform the overall characteristics of the avian community and are presented below.

3 Results

A total of 58 species were documented during the 2024 BAP. A summary table of species observed, and which surveys they were recorded in, is provided in Appendix C. Data are presented below by survey type, as each survey method has different sensitivities and parameters.

Three bird SAR, Evening Grosbeak (*Coccothraustes vespertinus*), Olive-Sided Flycatcher (*Contopus cooperi*), and Rusty Blackbird (*Euphagus carolinus*), were detected during the BAP, along with two SOCC. SAR and SOCC are discussed further in Section 3.1.5.

3.1.1 Breeding Bird Point Count Surveys

Thirty-seven species were identified during point count surveys. Point counts had a mean species richness of 7.6 (range: 3-12; Appendix B). The five most abundant species identified during the point count surveys were White-Throated Sparrow *(Zonotrichia albicollis*; 40 individuals), Ruby-crowned Kinglet (*Corthylio calendula*; 33 individuals), American Robin (*Turdus migratorius*; 29 individuals), Magnolia Warbler (*Setophaga magnolia*; 26 individuals) and Evening Grosbeak (*Coccothrastes vespertinus*; 25 individuals).

Species identified during point count surveys are presented in Table 3.1 with their conservation statuses, and the number of individuals of each species observed. Observations were of single individuals apart from one observation of 25 Evening Grosbeaks. SAR and SOCC are identified and are further discussed in Section 3.1.5. Detailed point count survey data can be found in Appendix D.

Table 3.1 Species List from 2024 Point Count Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed
American Black Duck†	*Anas rubripes*	-	-	-	S4B, S4N	1
American Redstart	*Setophaga ruticilla*	-	-	-	S5B	4
American Robin	*Turdus migratorius*	-	-	-	S5B	29
Bay-breasted Warbler*	*Setophaga castanea*	-	-	-	S2B, SUM	2
Black-and-white Warbler	*Mniotilta varia*	-	-	-	S5B	8
Black-capped Chickadee	*Poecile atricapillus*	-	-	-	S5	1
Blackpoll Warbler	*Setophaga striata*	-	-	-	S5B	9
Canada Jay	*Perisoreus canadensis*	-	-	-	S5	2
Cedar Waxwing†	*Bombycilla cedrorum*	-	-	-	S4B, SUM	1
Common Grackle†	*Quiscalus quiscula*	-	-	-	S4B, S3?N, SUM	1

Table 3.1 Species List from 2024 Point Count Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed
Common Loon	*Gavia immer*	-	-	-	S5B, S4N, SNRM	1
Common Raven	*Corvus corax*	-	-	-	S5	1
Common Yellowthroat	*Geothlypis trichas*	-	-	-	S5B	2
Dark-eyed Junco	*Junco hyemalis*	-	-	-	S5	2
Evening Grosbeak†	***Coccothraustes vespertinus***	**SC**	**SC**	**VU**	**S3S4**	**25**
Fox Sparrow	*Passerella iliaca*	-	-	-	S5B	20
Golden-crowned Kinglet	*Regulus satrapa*	-	-	-	S5B, S4N, SUM	8
Lincoln's Sparrow	*Melospiza lincolnii*	-	-	-	S5B	12
Magnolia Warbler	*Setophaga magnolia*	-	-	-	S5B, SUM	26
Northern Waterthrush	*Parkesia noveboracensis*	-	-	-	S5B	24
Olive-sided Flycatcher	***Contopus cooperi***	**SC**	**SC**	**VU**	**S3B, SUM**	**2**
Pine Grosbeak	*Pinicola enucleator*	-	-	-	S5	1
Purple Finch	*Haemorhous purpureus*	-	-	-	S5	1
Ruby-crowned Kinglet	*Corthylio calendula*	-	-	-	S5B	33
Rusty Blackbird	***Euphagus carolinus***	**SC**	**SC**	**VU**	**S2S3B, SUM**	**2**
Savannah Sparrow†	*Passerculus sandwichensis*	-	-	-	S5B	1
Spotted Sandpiper	*Actitis macularius*	-	-	-	S4B, SUM	1
Spruce Grouse†	*Canachites canadensis*	-	-	-	SNA	1
Swainson's Thrush	*Catharus ustulatus*	-	-	-	S5B	7
Swamp Sparrow	*Melospiza georgiana*	-	-	-	S5B	1
Tennessee Warbler†	*Leiothlypis peregrina*	-	-	-	S4B, SUM	1
White-throated Sparrow	*Zonotrichia albicollis*	-	-	-	S5B	40
Wilson's Snipe	*Gallinago delicata*	-	-	-	S5B	7
Wilson's Warbler	*Cardellina pusilla*	-	-	-	S5B	2
Yellow Warbler	*Setophaga petechia*	-	-	-	S5B	2

Table 3.1 Species List from 2024 Point Count Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed
Yellow-bellied Flycatcher	*Empidonax flaviventris*	-	-	-	S5B	10
Yellow-rumped Warbler	*Setophaga coronata*	-	-	-	S5B	16

Notes:
Bold = SAR
* = SOCC
SC = Special Concern
VU = Vulnerable
† = Species not observed with ARUs
AC CDC Ranks: See Appendix A

3.1.2 Autonomous Recording Unit Surveys

Fifty bird species were identified by ARU surveys. This number includes 20 species that were not identified during point count surveys (Table 3.2). Thirteen species were recorded by all five ARUs while 15 species were recorded by one ARU. The mean species richness recorded by ARUs was 28.8 (range 22-32; Appendix B). Species identified via ARU are presented in Table 3.2 with their conservation statuses, and the number of ARUs on which each species was identified. SAR and SOCC are identified and are further discussed in Section 3.1.5. Detailed ARU data can be found in Appendix D.

Table 3.2 Species List from 2024 ARU Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	# ARUs recording species
American Goldfinch†	*Spinus tristis*	-	-	-	S5	1
American Redstart	*Setophaga ruticilla*	-	-	-	S5B	2
American Robin	*Turdus migratorius*	-	-	-	S5B	5
Bay-breasted Warbler*	*Setophaga castanea*	-	-	-	S2B, SUM	1
Black-and-white Warbler	*Mniotilta varia*	-	-	-	S5B	4
Black-backed Woodpecker†	*Picoides arcticus*	-	-	-	S4	1
Black-capped Chickadee	*Poecile atricapillus*	-	-	-	S5	2
Blackpoll Warbler	*Setophaga striata*	-	-	-	S5B	3
Black-throated Green Warbler†	*Setophaga virens*	-	-	-	S5B	1
Blue-headed Vireo†	*Vireo solitarius*	-	-	-	S3S4B, SUM	2
Boreal Chickadee†	*Poecile hudsonicus*	-	-	-	S4	5
Brown Creeper†	*Certhia americana*	-	-	-	S3	2

Table 3.2 Species List from 2024 ARU Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	# ARUs recording species
Canada Jay	*Perisoreus canadensis*	-	-	-	S5	3
Cape May Warbler[*†]	*Setophaga tigrina*	-	-	-	S2B, SUM	3
Common Loon	*Gavia immer*	-	-	-	S5B, S4N, SNRM	4
Common Raven	*Corvus corax*	-	-	-	S5	1
Common Yellowthroat	*Geothlypis trichas*	-	-	-	S5B	2
Dark-eyed Junco	*Junco hyemalis*	-	-	-	S5	5
Fox Sparrow	*Passerella iliaca*	-	-	-	S5B	4
Golden-crowned Kinglet	*Regulus satrapa*	-	-	-	S5B, S4N, SUM	3
Greater Yellowlegs[†]	*Tringa melanoleuca*	-	-	-	S3B, S4M	1
Hairy Woodpecker[†]	*Dryobates villosus*	-	-	-	S4	2
Hermit Thrush[†]	*Catharus guttatus*	-	-	-	S5B	5
Lincoln's Sparrow	*Melospiza lincolnii*	-	-	-	S5B	4
Magnolia Warbler	*Setophaga magnolia*	-	-	-	S5B, SUM	5
Merlin[†]	*Falco columbarius*	-	-	-	S4S5B, SUM	1
Nashville Warbler[†]	*Leiothlypis ruficapilla*	-	-	-	S2B, SUM	1
Northern Flicker[†]	*Colaptes auratus*	-	-	-	S4	1
Northern Goshawk[†]	*Accipiter gentilis*	-	-	-	S3	1
Northern Waterthrush	*Parkesia noveboracensis*	-	-	-	S5B	5
Olive-sided Flycatcher	***Contopus cooperi***	**SC**	**SC**	**VU**	**S3B, SUM**	**3**
Palm Warbler[†]	*Setophaga palmarum*	-	-	-	S4B	2
Pine Grosbeak	*Pinicola enucleator*	-	-	-	S5	3
Pine Siskin[†]	*Spinus pinus*	-	-	-	S4S5	2
Purple Finch	*Haemorhous purpureus*	-	-	-	S5	2
Ruby-crowned Kinglet	*Corthylio calendula*	-	-	-	S5B	5
Rusty Blackbird	***Euphagus carolinus***	**SC**	**SC**	**VU**	**S2S3B, SUM**	**3**
Spotted Sandpiper	*Actitis macularius*	-	-	-	S4B, SUM	1
Swainson's Thrush	*Catharus ustulatus*	-	-	-	S5B	5
Swamp Sparrow	*Melospiza georgiana*	-	-	-	S5B	1
Tree Swallow[†]	*Tachycineta bicolor*	-	-	-	S4B, SUM	3
Vesper Sparrow[†]	*Pooecetes gramineus*	-	-	-	SNA	2

Table 3.2 Species List from 2024 ARU Surveys

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	# ARUs recording species
White-crowned Sparrow[†]	*Zonotrichia leucophrys*	-	-	-	S4B, SUM	1
White-throated Sparrow	*Zonotrichia albicollis*	-	-	-	S5B	5
White-winged Crossbill[†]	*Loxia leucoptera*	-	-	-	S5	4
Wilson's Snipe	*Gallinago delicata*	-	-	-	S5B	5
Wilson's Warbler	*Cardellina pusilla*	-	-	-	S5B	5
Yellow Warbler	*Setophaga petechia*	-	-	-	S5B	1
Yellow-bellied Flycatcher	*Empidonax flaviventris*	-	-	-	S5B	5
Yellow-rumped Warbler	*Setophaga coronata*	-	-	-	S5B	5

Notes:
Bold = SAR
* = SOCC
SC = Special Concern
VU = Vulnerable
[†] = ARU detections only (i.e., not observed during point counts)
AC CDC Ranks: See Appendix A

3.1.3 Area Search Surveys

Table 3.3 provides the species identified during area search surveys. Seventeen observations of 15 species were made during area searches. Only Spotted Sandpiper (*Actitis macularius*) and Tree Swallow (*Tachycineta bicolor*) were observed more than once (twice each). The only SAR identified was a single Rusty Blackbird, which is further discussed in Section 3.1.5. No species were detected during area searches that were not also detected during either point count surveys or ARU surveys. Observations are reported below with conservations statuses and the number of individuals observed. Detailed observation records can be found in Appendix D.

Table 3.3 Observation List from Area Searches

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed
Black-backed Woodpecker	*Picoides arcticus*	-	-	-	S4	1
Black-capped Chickadee	*Poecile atricapillus*	-	-	-	S5	2
Dark-eyed Junco	*Junco hyemalis*	-	-	-	S5	1
Hermit Thrush	*Catharus guttatus*	-	-	-	S5B	1
Lincoln's Sparrow	*Melospiza lincolnii*	-	-	-	S5B	1
Northern Goshawk	*Accipiter gentilis*	-	-	-	S3	1

Table 3.3 Observation List from Area Searches

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed
Northern Waterthrush	*Parkesia noveboracensis*	-	-	-	S5B	1
Rusty Blackbird	***Euphagus carolinus***	**SC**	**SC**	**VU**	**S2S3B, SUM**	**1**
Spotted Sandpiper	*Actitis macularius*	-	-	-	S4B, SUM	3
Swamp Sparrow	*Melospiza georgiana*	-	-	-	S5B	1
Tree Swallow	*Tachycineta bicolor*	-	-	-	S4B, SUM	2
Wilson's Warbler	*Cardellina pusilla*	-	-	-	S5B	1
Yellow Warbler	*Setophaga petechia*	-	-	-	S5B	1
Yellow-bellied Flycatcher	*Empidonax flaviventris*	-	-	-	S5B	1
Yellow-rumped Warbler	*Setophaga coronata*	-	-	-	S5B	1

Notes:
Bold = SAR
AC CDC Ranks: See Appendix A

3.1.4 Incidental Observations

Table 3.4 provides the species noted in incidental observations. Thirty-two observations of 17 species were recorded incidental during non-avian field surveys. These observations were collected during wetland assessments in September of 2024. Two SAR were identified, a single Evening Grosbeak, and two Rusty Blackbirds, which are further discussed on Section 3.1.5. Downy Woodpecker was the only species observed incidentally that was not observed during the bird surveys. Observations are reported below with conservations statuses and the number of individuals observed. Detailed observation records can be found in Appendix D.

Table 3.4 Incidental Observations of Avifauna

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed[1]
American Robin	*Turdus migratorius*	-	-	-	S5B	1
Black-capped Chickadee	*Poecile atricapillus*	-	-	-	S5	2 (2)
Boreal Chickadee	*Poecile hudsonicus*	-	-	-	S4	3 (3)
Canada Jay	*Perisoreus canadensis*	-	-	-	S5	6 (2)
Common Loon	*Gavia immer*	-	-	-	S5B, S4N, SNRM	1
Dark-eyed Junco	*Junco hyemalis*	-	-	-	S5	2 (2)
Downy Woodpecker[†]	*Dryobates pubescens*	-	-	-	S4	1

Table 3.4 Incidental Observations of Avifauna

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Number Observed[1]
Evening Grosbeak	***Coccothraustes vespertinus***	**SC**	**SC**	**VU**	**S3S4**	**1**
Golden-crowned Kinglet	*Regulus satrapa*	-	-	-	S5B, S4N, SUM	3 (3)
Greater Yellowlegs	*Tringa melanoleuca*	-	-	-	S3B, S4M	1
Hairy Woodpecker	*Dryobates villosus*	-	-	-	S4	1
Pine Grosbeak	*Pinicola enucleator*	-	-	-	S5	3 (3)
Pine Siskin	*Spinus pinus*	-	-	-	S4S5	11 (3)
Purple Finch	*Haemorhous purpureus*	-	-	-	S5	2 (2)
Ruby-crowned Kinglet	*Corthylio calendula*	-	-	-	S5B	1
Rusty Blackbird	***Euphagus carolinus***	**SC**	**SC**	**VU**	**S2S3B, SUM**	**2**
White-throated Sparrow	*Zonotrichia albicollis*	-	-	-	S5B	4 (4)

Notes:
[1] brackets indicate number of observations, no brackets indicate all individuals recorded in one observation
Bold = SAR
[+] = Species not observed during point count, ARU surveys or area searches
AC CDC Ranks: See Appendix A

3.1.5 Species at Risk and Species of Conservation Concern

During the 2024 BAP, three SAR and two SOCC were documented. SAR and SOCC are summarized in Table 3.5 along with their conservation statuses and from which surveys they were recorded. Each of the SAR are further discussed below the table. Note that these SAR and SOCC are not unique to habitats in or near the Project Area; historical records exist for these species elsewhere in the region, including Breeding Bird Survey (BBS) observation data (BBS route 57020 near Burlington, NL [Pardieck et al., 2020]) and Newfoundland Breeding Bird Atlas (NBBA) data (Atlas Square 21UWR63 and Region 3: Baie Verte–Buchans [Birds Canada 2025]).

Table 3.5 Species at Risk and Species of Conservation Concern Identified During the 2024 BAP

Common Name	Scientific Name	SARA	COSEWIC	NL ESA	Provincial AC CDC S-Rank	Survey
Species at Risk						
Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC	VU	S3S4	PC, INC
Olive-sided Flycatcher	*Contopus cooperi*	SC	SC	VU	S3B, SUM	PC, ARU
Rusty Blackbird	*Euphagus carolinus*	SC	SC	VU	S2S3B, SUM	PC, ARU, AREA, INC
Species of Conservation Concern						
Bay-breasted Warbler	*Setophaga castanea*	-	-	-	S2B, SUM	PC, ARU
Cape May Warbler	*Setophaga tigrina*	-	-	-	S2B, SUM	ARU

Notes:
PC = Point count; ARU = Autonomous Recording Unit Surveys; AREA = Area Searches; INC = Incidental
AC CDC Ranks: See Appendix A

3.1.5.1 Evening Grosbeak

Evening Grosbeak is listed as Special Concern under SARA, and as Vulnerable under the NL ESA. It was first added to Schedule 1 in 2019, following assessment by COSEWIC in 2016. The status has not changed since that time, and the species has not been reassessed. Evening Grosbeak was observed during both the point count surveys and as an incidental observation that occurred outside of the bird survey window.

3.1.5.2 Olive-Sided Flycatcher

Olive-sided Flycatcher is listed as Special Concern under SARA and as Vulnerable under the NL ESA. It was first assessed as Threatened in 2007; however, due to a stabilization in the rate of decline, it was reassessed as Special Concern in 2018. Its status on Schedule 1 of SARA was changed to Special Concern in 2023. Olive-sided Flycatcher was detected during point counts and by ARU surveys.

3.1.5.3 Rusty Blackbird

Rusty Blackbird is listed as Special Concern under SARA and as Vulnerable under the NL ESA. Rusty Blackbird has been listed as Special Concern since 2006, and no changes have been made to its status. It was last assessed in 2017. Rusty Blackbird was detected in all survey types during the 2024 BAP.

3.1.5.4 Bay-breasted Warbler

Bay-breasted Warbler is not listed under SARA or the NL ESA, but has a provincial s-rank of S2B, SUM. This indicates that the breeding population is imperilled (S2B) and that the status of the migratory population is uncertain (SUM). Bay-breasted Warbler was observed during point counts and detected by the ARU surveys.

3.1.5.5 Cape May Warbler

Cape May Warbler is not listed under SARA or the NL ESA, and has a provincial s-rank of S2B, SUM. This indicates that the breeding population is imperilled (S2B) and that the status of the migratory population is uncertain (SUM). Cape May Warbler was detected by the ARU surveys.

4 Summary

To support the development of the Green Bay Ming Mine Project, a Baseline Avifauna Program was completed in 2024 to characterize the baseline avian community in and around the Project during the breeding bird season. Breeding bird point count surveys and remote acoustic surveys to characterize the avian community prior to Project activities. A total of 58 species were observed including three SAR and two SOCC. These SAR and SOCC are not unique to the Project Area and observations exist elsewhere in the region (e.g., BBS and NBBA observation data).

5 References

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Appendices

Appendix A Explanation of National and Provincial Species at Risk and General Status Ranking

A.1 COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA AND *SPECIES AT RISK ACT* WILDLIFE SPECIES STATUS CATEGORIES

COSEWIC and SARA wildlife species status categories are described in Table A.1.

Table A.1 Committee on the Status of Endangered Wildlife in Canada and Species at Risk Act Species Status Category Descriptions

Status Category	Description*
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC)	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Source: COSEWIC 2023.

A.2 DESIGNATIONS UNDER THE NEWFOUNDLAND AND LABRADOR ENDANGERED SPECIES ACT

Species assessment and listings under the Newfoundland and Labrador *Endangered Species Act* (NL *ESA*) are coordinated by the Wildlife Division of the Newfoundland and Labrador Fisheries and Land Resources Department. Designations under the NL *ESA* are described in Table A.2.

Table A.2 Newfoundland and Labrador Endangered Species Act Designations and Descriptions

Designation	Description*
Extinct	A wildlife species that no longer exists.
Extirpate	A wildlife species that no longer exists in the wild but exists elsewhere.
Endangered	A wildlife species facing imminent extirpation or extinction.
Threatened	A wildlife species that is likely to become endangered if nothing is done to reverse the factors limiting its survival.
Vulnerable	A wildlife species that has characteristics which make it particularly sensitive to human activities or natural events, or restricted habitat or food requirements that are themselves under threat.
Data Deficient (DD)	A category that applies when all sources of available information have been investigated but the information in the status report is insufficient to determine risk of extinction based on distribution and/or population status.
Not at Risk (NAR)	Generally applied to widespread and abundant taxa.

NL FLR 2019. Excerpt from https://www.flr.gov.nl.ca/wildlife/endangeredspecies/Designations.pdf

A.3 ATLANTIC CANADA CONSERVATION DATA CENTRE RANKINGS

The AC CDC status ranks (S-rank) for the Island of Newfoundland were used to assess the rankings for bird species observed. Definitions of the AC CDC rankings are provided in Table A.3.

Table A.3 Definitions of the Atlantic Canada Conservation Data Centre S-Ranks

Provincial Ranking (S-rank)	Definition
SX	Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
S1	Critically Imperiled - Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2	Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or province.
S3	Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure - Common, widespread, and abundant in the province.
SNR	Unranked - Provincial conservation status not yet assessed.
SU	Unrankable - Possibly in peril, but status is uncertain - more information is needed
SNA	Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#/S#	Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4)
SH	Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
Not Provided	Species is not known to occur in the province.

AC CDC 2023.

Appendix B Survey Locations, Weather, and Species Richness

Table B.1 Point Count Locations, Weather, and Species Richness

PC ID	Habitat	Date	Lat	Long	Temp	Precip	Cloud Cover	Wind (kmh)	Noise	Species Richness
FB-1	Softwood	6/12/2024	49.932452	-56.131638	8	Fog	100%	<2	None	7
FB-2	Scrub	6/12/2024	49.936773	-56.128377	8	Fog	100%	<2	None	7
FB-3	Softwood	6/12/2024	49.934332	-56.125607	9	Fog	100%	<2	None	7
FB-4	Wetland	6/12/2024	49.931719	-56.123940	8	Fog	100%	<2	None	7
FB-5	Disturbed	6/12/2024	49.934299	-56.120561	8	Fog	100%	<2	None	8
FB-6	Scrub	6/12/2024	49.930140	-56.120401	8	Fog	100%	<2	None	6
FB-7	Scrub	6/12/2024	49.899837	-56.123325	10	Fog	100%	<2	Slight	7
FB-8	Scrub	6/12/2024	49.904480	-56.117664	10	Fog	100%	<2	None	8
FB-9	Softwood	6/12/2024	49.906208	-56.108063	10	Fog	100%	<2	Slight	8
FB-12	Softwood	6/12/2024	49.908034	-56.099051	10	Fog	100%	<2	None	5
FB-15	Softwood	6/13/2024	49.928461	-56.089931	7	Drizzle	100%	<2	None	10
FB-17	Softwood	6/13/2024	49.925077	-56.087033	7	Drizzle	100%	<2	Slight	9
FB-18	Softwood	6/13/2024	49.918326	-56.084505	7	Drizzle	100%	<2	Slight	7
FB-19	Softwood	6/13/2024	49.915862	-56.083495	7	Drizzle	100%	<2	Medium	3
FB-20	Softwood	6/13/2024	49.910709	-56.082702	7	Drizzle	100%	2 - 5	Medium	8
FB-21	Scrub	6/14/2024	49.908983	-56.080629	18	None	10%	2 - 5	Slight	5
FB-22	Scrub	6/13/2024	49.914141	-56.078799	7	Drizzle	100%	2 - 5	Medium	10
FB-23	Barrens	6/14/2024	49.911926	-56.075166	14	None	10%	<2	Slight	10
FB-24	Softwood	6/13/2024	49.907150	-56.073459	7	None	100%	<2	Slight	6
FB-25	Scrub	6/13/2024	49.909378	-56.071418	7	None	100%	<2	Slight	12
FB-26	Mixedwood	6/14/2024	49.911803	-56.064557	12	None	10%	<2	Slight	6
FB-27	Softwood	6/14/2024	49.899731	-56.064626	15	None	10%	<2	None	9
FB-28	Unknown	6/14/2024	49.899680	-56.060466	16	None	10%	<2	None	9
FB-29	Softwood	6/14/2024	49.897898	-56.073905	15	None	0%	<2	Slight	11
FB-30	Mixedwood	6/14/2024	49.890088	-56.084782	15	None	10%	<2	None	7
FB-31	Wetland	6/14/2024	49.918206	-56.071555	12	None	10%	<2	Excessive	7
FB-32	Mixedwood	6/14/2024	49.920368	-56.068310	15	None	10%	<2	Medium	6
FB-33	Disturbed	6/13/2024	49.939203	-56.079174	7	Fog	100%	<2	None	7
FB-34	Disturbed	6/14/2024	49.941973	-56.077733	15	None	10%	6 - 11	Slight	8

Notes:
Data for FB-30 inferred from locations surveyed before and after due to recording malfunction

Table B.2 ARU Locations and Species Richness

Unit ID	Habitat	Date Deployed	Date Retrieved	Lat	Long	Species Richness
SMM10631	Mixedwood	6/12/2024	6/25/2024	49.914884	-56.055227	22
SMM10632	Softwood	6/12/2024	6/25/2024	49.930498	-56.081968	32
SMM10634	Wetland	6/12/2024	6/25/2024	49.891224	-56.089717	30
SMM10675	Wetland	6/12/2024	6/25/2024	49.902296	-56.075204	28
SMM10702	Softwood	6/12/2024	6/25/2024	49.938410	-56.129836	32

Appendix C Summary of Species Observed During the 2024 Baseline Avian Program

Table C.1 Species Detected during all Surveys during 2024 BAP

Common Name	Scientific Name	Point Counts	ARUs	Area Searches	Incidental Observations
American Black Duck	*Anas rubripes*	X			
American Goldfinch	*Spinus tristis*		X		
American Redstart	*Setophaga ruticilla*	X	X		
American Robin	*Turdus migratorius*	X	X		X
Bay-breasted Warbler	*Setophaga castanea*	X	X		
Black-and-white Warbler	*Mniotilta varia*	X	X		
Black-backed Woodpecker	*Picoides arcticus*		X	X	
Black-capped Chickadee	*Poecile atricapillus*	X	X	X	X
Blackpoll Warbler	*Setophaga striata*	X	X		
Black-throated Green Warbler	*Setophaga virens*		X		
Blue-headed Vireo	*Vireo solitarius*		X		
Boreal Chickadee	*Poecile hudsonicus*		X		X
Brown Creeper	*Certhia americana*		X		
Canada Jay	*Perisoreus canadensis*	X	X		X
Cape May Warbler	*Setophaga tigrina*		X		
Cedar Waxwing	*Bombycilla cedrorum*	X			
Common Grackle	*Quiscalus quiscula*	X			
Common Loon	*Gavia immer*	X	X		X
Common Raven	*Corvus corax*	X	X		
Common Yellowthroat	*Geothlypis trichas*	X	X		
Dark-eyed Junco	*Junco hyemalis*	X	X	X	X
Downy Woodpecker	*Dryobates pubescens*	X			X
Evening Grosbeak	***Coccothraustes vespertinus***	**X**			**X**
Fox Sparrow	*Passerella iliaca*	X	X		
Golden-crowned Kinglet	*Regulus satrapa*	X	X		X
Greater Yellowlegs	*Tringa melanoleuca*		X		X
Hairy Woodpecker	*Dryobates villosus*		X		X
Hermit Thrush	*Catharus guttatus*		X	X	
Lincoln's Sparrow	*Melospiza lincolnii*	X	X	X	
Magnolia Warbler	*Setophaga magnolia*	X	X		
Merlin	*Falco columbarius*		X		
Nashville Warbler	*Leiothlypis ruficapilla*		X		
Northern Flicker	*Colaptes auratus*		X		
Northern Goshawk	*Accipiter gentilis*		X	X	
Northern Waterthrush	*Parkesia noveboracensis*	X	X	X	
Olive-sided Flycatcher	***Contopus cooperi***	**X**	**X**		
Palm Warbler	*Setophaga palmarum*		X		

Table C.1 Species Detected during all Surveys during 2024 BAP

Common Name	Scientific Name	Point Counts	ARUs	Area Searches	Incidental Observations
Pine Grosbeak	*Pinicola enucleator*	X	X		X
Pine Siskin	*Spinus pinus*		X		X
Purple Finch	*Haemorhous purpureus*	X	X		X
Ruby-crowned Kinglet	*Corthylio calendula*	X	X		X
Rusty Blackbird	***Euphagus carolinus***	**X**	**X**	**X**	**X**
Savannah Sparrow	*Passerculus sandwichensis*	X			
Spotted Sandpiper	*Actitis macularius*	X	X	X	
Spruce Grouse	*Canachites canadensis*	X			
Swainson's Thrush	*Catharus ustulatus*	X	X	X	
Swamp Sparrow	*Melospiza georgiana*	X	X	X	
Tennessee Warbler	*Leiothlypis peregrina*	X			
Tree Swallow	*Tachycineta bicolor*		X	X	X
Vesper Sparrow	*Pooecetes gramineus*		X		
White-crowned Sparrow	*Zonotrichia leucophrys*		X		
White-throated Sparrow	*Zonotrichia albicollis*	X	X		X
White-winged Crossbill	*Loxia leucoptera*		X		
Wilson's Snipe	*Gallinago delicata*	X	X		
Wilson's Warbler	*Cardellina pusilla*	X	X	X	
Yellow Warbler	*Setophaga petechia*	X	X	X	
Yellow-bellied Flycatcher	*Empidonax flaviventris*	X	X	X	
Yellow-rumped Warbler	*Setophaga coronata*	X	X	X	

Appendix D Detailed Survey Data

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-1	American Robin	*Turdus migratorius*	1	Singing
FB-1	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-1	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-1	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-1	Wilson's Warbler	*Cardellina pusilla*	1	Singing
FB-1	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-1	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-2	**Olive-sided Flycatcher**	***Contopus cooperi***	**1**	**Singing**
FB-2	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-2	Swainson's Thrush	*Catharus ustulatus*	1	Visual
FB-2	White-throated Sparrow	*Zonotrichia albicollis*	1	Visual and Singing/Calling
FB-2	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-2	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-2	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-2	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-2	Swainson's Thrush	*Catharus ustulatus*	1	Visual
FB-2	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-2	Lincoln's Sparrow	*Melospiza lincolnii*	1	Visual
FB-2	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-3	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-3	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-3	American Robin	*Turdus migratorius*	1	Singing
FB-3	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-3	American Robin	*Turdus migratorius*	1	Calling
FB-3	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-3	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-3	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-3	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-3	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-3	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-3	American Robin	*Turdus migratorius*	1	Calling
FB-3	American Robin	*Turdus migratorius*	1	Singing
FB-4	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-4	Common Yellowthroat	*Geothlypis trichas*	1	Singing
FB-4	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-4	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-4	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-4	**Olive-sided Flycatcher**	***Contopus cooperi***	**1**	**Singing**
FB-4	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-4	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-5	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-5	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-5	Common Yellowthroat	*Geothlypis trichas*	1	Singing
FB-5	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-5	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-5	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-5	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-5	**Evening Grosbeak**	***Coccothraustes vespertinus***	**25**	**Flyover**
FB-5	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-5	Spruce Grouse	*Canachites canadensis*	1	Visual
FB-6	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-6	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-6	American Robin	*Turdus migratorius*	1	Calling
FB-6	Canada Jay	*Perisoreus canadensis*	1	Visual and Singing/Calling
FB-6	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-6	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-6	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-6	American Robin	*Turdus migratorius*	1	Singing
FB-6	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-6	American Robin	*Turdus migratorius*	1	Calling
FB-6	American Robin	*Turdus migratorius*	1	Singing
FB-7	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-7	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-7	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-7	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-7	American Robin	*Turdus migratorius*	1	Singing
FB-7	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-7	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-7	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-7	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-7	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-7	American Robin	*Turdus migratorius*	1	Singing
FB-8	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-8	Swainson's Thrush	*Catharus ustulatus*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-8	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-8	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-8	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-8	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-8	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-8	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-8	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-8	Common Raven	*Corvus corax*	1	Calling
FB-8	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-9	Swainson's Thrush	*Catharus ustulatus*	1	Singing
FB-9	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-9	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-9	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-9	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-9	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-9	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-9	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-9	Canada Jay	*Perisoreus canadensis*	1	Visual and Singing/Calling
FB-12	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-12	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-12	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-12	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-12	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-12	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-12	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-15	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-15	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-15	Dark-eyed Junco	*Junco hyemalis*	1	Singing
FB-15	American Robin	*Turdus migratorius*	1	Singing
FB-15	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-15	Swainson's Thrush	*Catharus ustulatus*	1	Singing
FB-15	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-15	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-15	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-15	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-15	American Robin	*Turdus migratorius*	1	Singing
FB-17	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-17	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-17	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-17	American Robin	*Turdus migratorius*	1	Singing
FB-17	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-17	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-17	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-17	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-17	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-17	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-17	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-18	Yellow Warbler	*Setophaga petechia*	1	Singing
FB-18	Golden-crowned Kinglet	*Regulus satrapa*	1	Calling
FB-18	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-18	American Robin	*Turdus migratorius*	1	Singing
FB-18	Dark-eyed Junco	*Junco hyemalis*	1	Singing
FB-18	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-18	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-19	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-19	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-19	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-20	American Robin	*Turdus migratorius*	1	Singing
FB-20	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-20	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-20	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-20	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-20	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-20	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-20	Common Loon	*Gavia immer*	1	Flyover and Singing/Calling
FB-20	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-21	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-21	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-21	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-21	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-21	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-22	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-22	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-22	American Robin	*Turdus migratorius*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-22	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-22	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-22	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-22	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-22	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-22	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-22	Blackpoll Warbler	*Setophaga striata*	1	Singing
FB-22	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-23	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-23	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-23	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-23	American Robin	*Turdus migratorius*	1	Singing
FB-23	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-23	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-23	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-23	Wilson's Snipe	*Gallinago delicata*	1	Singing
FB-23	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-23	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-23	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-23	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-23	American Robin	*Turdus migratorius*	1	Singing
FB-23	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-23	American Robin	*Turdus migratorius*	1	Visual and Singing/Calling
FB-24	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-24	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-24	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-24	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-24	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-24	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-24	American Robin	*Turdus migratorius*	1	Singing
FB-24	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-25	Wilson's Warbler	*Cardellina pusilla*	1	Singing
FB-25	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-25	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-25	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-25	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-25	American Redstart	*Setophaga ruticilla*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-25	American Robin	*Turdus migratorius*	1	Singing
FB-25	Tennessee Warbler	*Leiothlypis peregrina*	1	Singing
FB-25	Swainson's Thrush	*Catharus ustulatus*	1	Singing
FB-25	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-25	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-25	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-25	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-26	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-26	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-26	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-26	Bay-breasted Warbler	*Setophaga castanea*	1	Singing
FB-26	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-26	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-26	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-26	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-26	Purple Finch	*Haemorhous purpureus*	1	Singing
FB-27	Black-and-white Warbler	*Mniotilta varia*	1	Singing
FB-27	Golden-crowned Kinglet	*Regulus satrapa*	1	Singing
FB-27	American Robin	*Turdus migratorius*	1	Singing
FB-27	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-27	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-27	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-27	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-27	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-27	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-27	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-28	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-28	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-28	Bay-breasted Warbler	*Setophaga castanea*	1	Singing
FB-28	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-28	American Redstart	*Setophaga ruticilla*	1	Singing
FB-28	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-28	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-28	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Calling
FB-28	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-28	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-28	American Redstart	*Setophaga ruticilla*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-28	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-28	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-29	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-29	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-29	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-29	American Black Duck	*Anas rubripes*	1	Visual
FB-29	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-29	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-29	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-29	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-29	Common Grackle	*Quiscalus quiscula*	1	Visual
FB-29	Spotted Sandpiper	*Actitis macularius*	1	Flyover and Singing/Calling
FB-29	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-29	Cedar Waxwing	*Bombycilla cedrorum*	1	Flyover and Singing/Calling
FB-29	**Rusty Blackbird**	***Euphagus carolinus***	**1**	**Singing**
FB-29	**Rusty Blackbird**	***Euphagus carolinus***	**1**	**Singing**
FB-30	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-30	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-30	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-30	American Robin	*Turdus migratorius*	1	Singing
FB-30	American Redstart	*Setophaga ruticilla*	1	Singing
FB-30	Black-capped Chickadee	*Poecile atricapillus*	1	Singing
FB-30	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-31	American Robin	*Turdus migratorius*	1	Singing
FB-31	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-31	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-31	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing
FB-31	Savannah Sparrow	*Passerculus sandwichensis*	1	Singing
FB-31	Swamp Sparrow	*Melospiza georgiana*	1	Singing
FB-31	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-31	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-31	American Robin	*Turdus migratorius*	1	Singing
FB-31	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-32	Yellow-rumped Warbler	*Setophaga coronata*	1	Visual and Singing/Calling
FB-32	American Robin	*Turdus migratorius*	1	Singing
FB-32	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-32	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing

Table D.1 Point Count Surveys

Location ID	Common Name	Scientific Name	Number	Behaviour Observed
FB-32	Pine Grosbeak	*Pinicola enucleator*	1	Singing
FB-32	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-33	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-33	Wilson's Snipe	*Gallinago delicata*	1	Calling
FB-33	Ruby-crowned Kinglet	*Corthylio calendula*	1	Singing
FB-33	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-33	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-33	Swainson's Thrush	*Catharus ustulatus*	1	Singing
FB-33	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-33	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-33	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-33	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-33	Yellow-bellied Flycatcher	*Empidonax flaviventris*	1	Singing
FB-33	White-throated Sparrow	*Zonotrichia albicollis*	1	Visual
FB-34	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-34	American Robin	*Turdus migratorius*	1	Flyover and Singing/Calling
FB-34	Yellow Warbler	*Setophaga petechia*	1	Singing
FB-34	Yellow-rumped Warbler	*Setophaga coronata*	1	Singing
FB-34	Fox Sparrow	*Passerella iliaca*	1	Singing
FB-34	Magnolia Warbler	*Setophaga magnolia*	1	Singing
FB-34	White-throated Sparrow	*Zonotrichia albicollis*	1	Singing
FB-34	Northern Waterthrush	*Parkesia noveboracensis*	1	Singing
FB-34	American Robin	*Turdus migratorius*	1	Singing
FB-34	Lincoln's Sparrow	*Melospiza lincolnii*	1	Singing

Notes:
Not all proposed point count locations were surveyed. No surveys were conducted at FB-10, FB-11, FB-13, FB-14, FB-16.

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10631	6/12/2024	American Robin	*Turdus migratorius*
SMM10631	6/12/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10631	6/12/2024	Hermit Thrush	*Catharus guttatus*
SMM10631	6/12/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/12/2024	Purple Finch	*Haemorhous purpureus*
SMM10631	6/12/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/12/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/12/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/12/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/13/2024	American Robin	*Turdus migratorius*
SMM10631	6/13/2024	Hermit Thrush	*Catharus guttatus*
SMM10631	6/13/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/13/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/13/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/13/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/14/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/14/2024	Black-throated Green Warbler	*Setophaga virens*
SMM10631	6/14/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/14/2024	Hermit Thrush	*Catharus guttatus*
SMM10631	6/14/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10631	6/14/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/14/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/14/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/14/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/14/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/15/2024	American Robin	*Turdus migratorius*
SMM10631	6/15/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/15/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/15/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10631	6/15/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/15/2024	Purple Finch	*Haemorhous purpureus*
SMM10631	6/15/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/15/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/15/2024	Wilson's Snipe	*Gallinago delicata*
SMM10631	6/15/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/16/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/16/2024	Northern Waterthrush	*Parkesia noveboracensis*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10631	6/16/2024	Purple Finch	*Haemorhous purpureus*
SMM10631	6/16/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/16/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10631	6/16/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/17/2024	American Robin	*Turdus migratorius*
SMM10631	6/17/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10631	6/17/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/17/2024	Purple Finch	*Haemorhous purpureus*
SMM10631	6/17/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/17/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/17/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/18/2024	American Redstart	*Setophaga ruticilla*
SMM10631	6/18/2024	American Robin	*Turdus migratorius*
SMM10631	6/18/2024	Bay-breasted Warbler	*Setophaga castanea*
SMM10631	6/18/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/18/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/18/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/18/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/18/2024	Wilson's Snipe	*Gallinago delicata*
SMM10631	6/18/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10631	6/19/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/19/2024	Brown Creeper	*Certhia americana*
SMM10631	6/19/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10631	6/19/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/19/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/19/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/19/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/19/2024	Wilson's Snipe	*Gallinago delicata*
SMM10631	6/19/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/20/2024	Bay-breasted Warbler	*Setophaga castanea*
SMM10631	6/20/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/20/2024	Blue-headed Vireo	*Vireo solitarius*
SMM10631	6/20/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/20/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/20/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/20/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/20/2024	Yellow-rumped Warbler	*Setophaga coronata*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10631	6/21/2024	American Robin	*Turdus migratorius*
SMM10631	6/21/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/21/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/21/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/21/2024	Purple Finch	*Haemorhous purpureus*
SMM10631	6/21/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/21/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/21/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/22/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/22/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/22/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/22/2024	Pine Grosbeak	*Pinicola enucleator*
SMM10631	6/22/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/22/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/22/2024	Wilson's Snipe	*Gallinago delicata*
SMM10631	6/22/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/23/2024	American Robin	*Turdus migratorius*
SMM10631	6/23/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10631	6/23/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/23/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/23/2024	Pine Grosbeak	*Pinicola enucleator*
SMM10631	6/23/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/23/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/23/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/24/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/24/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/25/2024	American Robin	*Turdus migratorius*
SMM10631	6/25/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10631	6/25/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10631	6/25/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10631	6/25/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10631	6/25/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10631	6/25/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10631	6/25/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10631	6/25/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/12/2024	American Robin	*Turdus migratorius*
SMM10632	6/12/2024	Black-and-white Warbler	*Mniotilta varia*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10632	6/12/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/12/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/12/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10632	6/12/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/12/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/12/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/12/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10632	6/12/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/12/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/13/2024	American Robin	*Turdus migratorius*
SMM10632	6/13/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/13/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/13/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/13/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10632	6/13/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/13/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/14/2024	American Robin	*Turdus migratorius*
SMM10632	6/14/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/14/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/14/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/14/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/14/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/14/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/14/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10632	6/14/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/14/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10632	6/14/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/15/2024	American Robin	*Turdus migratorius*
SMM10632	6/15/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/15/2024	Common Loon	*Gavia immer*
SMM10632	6/15/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10632	6/15/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/15/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/15/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/15/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/15/2024	Purple Finch	*Haemorhous purpureus*
SMM10632	6/15/2024	Ruby-crowned Kinglet	*Corthylio calendula*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10632	6/15/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/15/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10632	6/15/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/15/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/16/2024	American Robin	*Turdus migratorius*
SMM10632	6/16/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/16/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/16/2024	Common Raven	*Corvus corax*
SMM10632	6/16/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/16/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/16/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/16/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/16/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/16/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/16/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/17/2024	American Robin	*Turdus migratorius*
SMM10632	6/17/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/17/2024	Blue-headed Vireo	*Vireo solitarius*
SMM10632	6/17/2024	Common Raven	*Corvus corax*
SMM10632	6/17/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/17/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/17/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/17/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/17/2024	Pine Grosbeak	*Pinicola enucleator*
SMM10632	6/17/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/17/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/17/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/18/2024	American Robin	*Turdus migratorius*
SMM10632	6/18/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/18/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/18/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/18/2024	Common Loon	*Gavia immer*
SMM10632	6/18/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10632	6/18/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/18/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/18/2024	Merlin	*Falco columbarius*
SMM10632	6/18/2024	Northern Goshawk	*Accipiter gentilis*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10632	6/18/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/18/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/18/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/18/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10632	6/18/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/19/2024	American Goldfinch	*Spinus tristis*
SMM10632	6/19/2024	American Robin	*Turdus migratorius*
SMM10632	6/19/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/19/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/19/2024	Common Raven	*Corvus corax*
SMM10632	6/19/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10632	6/19/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/19/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/19/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10632	6/19/2024	Northern Goshawk	*Accipiter gentilis*
SMM10632	6/19/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/19/2024	Palm Warbler	*Setophaga palmarum*
SMM10632	6/19/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/19/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/19/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10632	6/19/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/20/2024	American Robin	*Turdus migratorius*
SMM10632	6/20/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/20/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/20/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/20/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/20/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10632	6/20/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/20/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/20/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10632	6/20/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/20/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10632	6/20/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/21/2024	American Goldfinch	*Spinus tristis*
SMM10632	6/21/2024	American Robin	*Turdus migratorius*
SMM10632	6/21/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/21/2024	Blackpoll Warbler	*Setophaga striata*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10632	6/21/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/21/2024	Canada Jay	*Perisoreus canadensis*
SMM10632	6/21/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/21/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/21/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/21/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10632	6/21/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/21/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/21/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/22/2024	American Robin	*Turdus migratorius*
SMM10632	6/22/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/22/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/22/2024	Canada Jay	*Perisoreus canadensis*
SMM10632	6/22/2024	Common Raven	*Corvus corax*
SMM10632	6/22/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/22/2024	Hermit Thrush	*Catharus guttatus*
SMM10632	6/22/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/22/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10632	6/22/2024	Pine Grosbeak	*Pinicola enucleator*
SMM10632	6/22/2024	Red Squirrel	*Tamiasciurus hudsonicus*
SMM10632	6/22/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/22/2024	Tree Swallow	*Tachycineta bicolor*
SMM10632	6/22/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/22/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10632	6/22/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/22/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/23/2024	American Robin	*Turdus migratorius*
SMM10632	6/23/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/23/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/23/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/23/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10632	6/23/2024	Hermit Thrush	*Catharus guttatus*
SMM10632	6/23/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/23/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/23/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/23/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/24/2024	Black-and-white Warbler	*Mniotilta varia*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10632	6/24/2024	Blackpoll Warbler	*Setophaga striata*
SMM10632	6/24/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/24/2024	Common Raven	*Corvus corax*
SMM10632	6/24/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/24/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/24/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10632	6/25/2024	American Robin	*Turdus migratorius*
SMM10632	6/25/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10632	6/25/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10632	6/25/2024	Brown Creeper	*Certhia americana*
SMM10632	6/25/2024	Fox Sparrow	*Passerella iliaca*
SMM10632	6/25/2024	Hermit Thrush	*Catharus guttatus*
SMM10632	6/25/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10632	6/25/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10632	6/25/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10632	6/25/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10632	6/25/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10632	6/25/2024	Wilson's Snipe	*Gallinago delicata*
SMM10632	6/25/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/12/2024	American Robin	*Turdus migratorius*
SMM10634	6/12/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/12/2024	Canada Jay	*Perisoreus canadensis*
SMM10634	6/12/2024	Common Yellowthroat	*Geothlypis trichas*
SMM10634	6/12/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/12/2024	Fox Sparrow	*Passerella iliaca*
SMM10634	6/12/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/12/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/12/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/12/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/12/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/12/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/12/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10634	6/12/2024	Yellow Warbler	*Setophaga petechia*
SMM10634	6/12/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/13/2024	American Robin	*Turdus migratorius*
SMM10634	6/13/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/13/2024	Hermit Thrush	*Catharus guttatus*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10634	6/13/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/13/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/13/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/13/2024	Wilson's Snipe	*Gallinago delicata*
SMM10634	6/14/2024	American Robin	*Turdus migratorius*
SMM10634	6/14/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/14/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/14/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/14/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/14/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/14/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/14/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/14/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/14/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/14/2024	Wilson's Snipe	*Gallinago delicata*
SMM10634	6/14/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10634	6/14/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/15/2024	American Robin	*Turdus migratorius*
SMM10634	6/15/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/15/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10634	6/15/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/15/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/15/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/15/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/15/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/15/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/15/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/15/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/15/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10634	6/15/2024	Wilson's Snipe	*Gallinago delicata*
SMM10634	6/15/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10634	6/15/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10634	6/16/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/16/2024	Canada Jay	*Perisoreus canadensis*
SMM10634	6/16/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/16/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/16/2024	Hermit Thrush	*Catharus guttatus*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10634	6/16/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/16/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/16/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/16/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/16/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10634	6/16/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/16/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10634	6/16/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/17/2024	American Robin	*Turdus migratorius*
SMM10634	6/17/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/17/2024	Canada Jay	*Perisoreus canadensis*
SMM10634	6/17/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/17/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/17/2024	Fox Sparrow	*Passerella iliaca*
SMM10634	6/17/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/17/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/17/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/17/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/17/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/17/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/18/2024	American Robin	*Turdus migratorius*
SMM10634	6/18/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10634	6/18/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/18/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/18/2024	Pine Grosbeak	*Pinicola enucleator*
SMM10634	6/18/2024	Pine Siskin	*Spinus pinus*
SMM10634	6/18/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/18/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/18/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/19/2024	American Robin	*Turdus migratorius*
SMM10634	6/19/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/19/2024	Black-backed Woodpecker	*Picoides arcticus*
SMM10634	6/19/2024	Hairy Woodpecker	*Dryobates villosus*
SMM10634	6/19/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/19/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/19/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/19/2024	Northern Flicker	*Colaptes auratus*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10634	6/19/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/19/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	**6/19/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10634	6/19/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10634	6/19/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/19/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/20/2024	American Robin	*Turdus migratorius*
SMM10634	6/20/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/20/2024	Common Loon	*Gavia immer*
SMM10634	6/20/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/20/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	**6/20/2024**	**Olive-sided Flycatcher**	***Contopus cooperi***
SMM10634	6/20/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/20/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/20/2024	Wilson's Snipe	*Gallinago delicata*
SMM10634	6/20/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/21/2024	American Robin	*Turdus migratorius*
SMM10634	6/21/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/21/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10634	6/21/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/21/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/21/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	**6/21/2024**	**Olive-sided Flycatcher**	***Contopus cooperi***
SMM10634	6/21/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/21/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10634	6/21/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/21/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10634	6/22/2024	American Robin	*Turdus migratorius*
SMM10634	6/22/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/22/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10634	6/22/2024	Cape May Warbler	*Setophaga tigrina*
SMM10634	6/22/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/22/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/22/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	**6/22/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10634	6/22/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/22/2024	Wilson's Snipe	*Gallinago delicata*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10634	6/22/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10634	6/23/2024	American Robin	*Turdus migratorius*
SMM10634	6/23/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/23/2024	Canada Jay	*Perisoreus canadensis*
SMM10634	6/23/2024	Common Loon	*Gavia immer*
SMM10634	6/23/2024	Hermit Thrush	*Catharus guttatus*
SMM10634	6/23/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/23/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/23/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/23/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/23/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10634	6/23/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10634	6/24/2024	Greater Yellowlegs	*Tringa melanoleuca*
SMM10634	6/24/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/24/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/24/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/25/2024	American Robin	*Turdus migratorius*
SMM10634	6/25/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10634	6/25/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10634	6/25/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10634	6/25/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10634	6/25/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10634	6/25/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10634	6/25/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10634	6/25/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10634	6/25/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10634	6/25/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/12/2024	American Robin	*Turdus migratorius*
SMM10675	6/12/2024	Common Loon	*Gavia immer*
SMM10675	6/12/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10675	6/12/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/12/2024	Hermit Thrush	*Catharus guttatus*
SMM10675	6/12/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/12/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	**6/12/2024**	**Olive-sided Flycatcher**	***Contopus cooperi***
SMM10675	6/12/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/12/2024	Swamp Sparrow	*Melospiza georgiana*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10675	6/12/2024	Tree Swallow	*Tachycineta bicolor*
SMM10675	6/12/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/12/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10675	6/12/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/12/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/13/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/13/2024	Blackpoll Warbler	*Setophaga striata*
SMM10675	6/13/2024	Cape May Warbler	*Setophaga tigrina*
SMM10675	6/13/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/13/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/13/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	6/13/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/13/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/13/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/14/2024	American Robin	*Turdus migratorius*
SMM10675	6/14/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/14/2024	Blackpoll Warbler	*Setophaga striata*
SMM10675	6/14/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10675	6/14/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/14/2024	Nashville Warbler	*Leiothlypis ruficapilla*
SMM10675	6/14/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	**6/14/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/14/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/14/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/14/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/14/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/14/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/14/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10675	6/14/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/15/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/15/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/15/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/15/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/15/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/15/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/15/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/15/2024	Wilson's Warbler	*Cardellina pusilla*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10675	6/15/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/16/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/16/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/16/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	**6/16/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/16/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/16/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/16/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/16/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/17/2024	American Robin	*Turdus migratorius*
SMM10675	6/17/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/17/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/17/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/18/2024	American Robin	*Turdus migratorius*
SMM10675	6/18/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10675	6/18/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/18/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10675	6/18/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/18/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	**6/18/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/18/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/18/2024	Tree Swallow	*Tachycineta bicolor*
SMM10675	6/18/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/19/2024	American Robin	*Turdus migratorius*
SMM10675	6/19/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/19/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10675	6/19/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/19/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/19/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/19/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/19/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/19/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/19/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/19/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/19/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/20/2024	American Redstart	*Setophaga ruticilla*
SMM10675	6/20/2024	American Robin	*Turdus migratorius*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10675	6/20/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/20/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/20/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/20/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/20/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/20/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/20/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/20/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/20/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/21/2024	American Redstart	*Setophaga ruticilla*
SMM10675	6/21/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/21/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10675	6/21/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/21/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/21/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/21/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/21/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/21/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/21/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/21/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/21/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/22/2024	American Redstart	*Setophaga ruticilla*
SMM10675	6/22/2024	American Robin	*Turdus migratorius*
SMM10675	6/22/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/22/2024	Hermit Thrush	*Catharus guttatus*
SMM10675	6/22/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/22/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/22/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/22/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/22/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/22/2024	Tree Swallow	*Tachycineta bicolor*
SMM10675	6/22/2024	Vesper Sparrow	*Pooecetes gramineus*
SMM10675	6/22/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10675	6/22/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/22/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/22/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/23/2024	American Redstart	*Setophaga ruticilla*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10675	6/23/2024	American Robin	*Turdus migratorius*
SMM10675	6/23/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10675	6/23/2024	Black-capped Chickadee	*Poecile atricapillus*
SMM10675	6/23/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10675	6/23/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/23/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/23/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/23/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/23/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/23/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/23/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/23/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10675	6/24/2024	American Redstart	*Setophaga ruticilla*
SMM10675	6/24/2024	American Robin	*Turdus migratorius*
SMM10675	6/24/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10675	6/24/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/24/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	6/24/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/24/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/24/2024	Wilson's Snipe	*Gallinago delicata*
SMM10675	6/24/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/25/2024	American Redstart	*Setophaga ruticilla*
SMM10675	6/25/2024	American Robin	*Turdus migratorius*
SMM10675	6/25/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10675	6/25/2024	Fox Sparrow	*Passerella iliaca*
SMM10675	6/25/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10675	6/25/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10675	6/25/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10675	**6/25/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10675	6/25/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10675	6/25/2024	Swamp Sparrow	*Melospiza georgiana*
SMM10675	6/25/2024	Tree Swallow	*Tachycineta bicolor*
SMM10675	6/25/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10675	6/25/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/12/2024	Common Yellowthroat	*Geothlypis trichas*
SMM10702	6/12/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/12/2024	Golden-crowned Kinglet	*Regulus satrapa*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10702	6/12/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/12/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/12/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/12/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/12/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/12/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/12/2024	Wilson's Snipe	*Gallinago delicata*
SMM10702	6/12/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/12/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/13/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/13/2024	Common Loon	*Gavia immer*
SMM10702	6/13/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/13/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/13/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/13/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/13/2024	Palm Warbler	*Setophaga palmarum*
SMM10702	6/13/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/13/2024	Wilson's Snipe	*Gallinago delicata*
SMM10702	6/13/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/13/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/14/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/14/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/14/2024	Common Loon	*Gavia immer*
SMM10702	6/14/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/14/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/14/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/14/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/14/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/14/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/14/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/14/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10702	6/14/2024	Vesper Sparrow	*Pooecetes gramineus*
SMM10702	6/14/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/14/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/14/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/14/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/15/2024	Black-and-white Warbler	*Mniotilta varia*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10702	6/15/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/15/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10702	6/15/2024	Cape May Warbler	*Setophaga tigrina*
SMM10702	6/15/2024	Common Yellowthroat	*Geothlypis trichas*
SMM10702	6/15/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/15/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/15/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/15/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/15/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/15/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/15/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10702	6/15/2024	Vesper Sparrow	*Pooecetes gramineus*
SMM10702	6/15/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/15/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/16/2024	American Robin	*Turdus migratorius*
SMM10702	6/16/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/16/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/16/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/16/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/16/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	**6/16/2024**	**Olive-sided Flycatcher**	***Contopus cooperi***
SMM10702	6/16/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/16/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10702	6/16/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/17/2024	American Robin	*Turdus migratorius*
SMM10702	6/17/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/17/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/17/2024	Common Loon	*Gavia immer*
SMM10702	6/17/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/17/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/17/2024	Hairy Woodpecker	*Dryobates villosus*
SMM10702	6/17/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/17/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/17/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/17/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/17/2024	Pine Siskin	*Spinus pinus*
SMM10702	6/17/2024	Ruby-crowned Kinglet	*Corthylio calendula*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10702	6/17/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10702	6/17/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/17/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/18/2024	American Robin	*Turdus migratorius*
SMM10702	6/18/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/18/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/18/2024	Common Loon	*Gavia immer*
SMM10702	6/18/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/18/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/18/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/18/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/18/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/18/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	**6/18/2024**	**Olive-sided Flycatcher**	***Contopus cooperi***
SMM10702	6/18/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/18/2024	Spotted Sandpiper	*Actitis macularius*
SMM10702	6/18/2024	White-crowned Sparrow	*Zonotrichia leucophrys*
SMM10702	6/18/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/18/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/18/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/18/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/19/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/19/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/19/2024	Cape May Warbler	*Setophaga tigrina*
SMM10702	6/19/2024	Common Loon	*Gavia immer*
SMM10702	6/19/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/19/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/19/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/19/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/19/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/19/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/19/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	**6/19/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10702	6/19/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/19/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/19/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/20/2024	American Robin	*Turdus migratorius*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10702	6/20/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/20/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/20/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/20/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/20/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/20/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/20/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	**6/20/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10702	6/20/2024	Vesper Sparrow	*Pooecetes gramineus*
SMM10702	6/20/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/20/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/21/2024	American Robin	*Turdus migratorius*
SMM10702	6/21/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/21/2024	Canada Jay	*Perisoreus canadensis*
SMM10702	6/21/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/21/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/21/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/21/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/21/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/21/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	**6/21/2024**	**Rusty Blackbird**	***Euphagus carolinus***
SMM10702	6/21/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/21/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10702	6/22/2024	American Robin	*Turdus migratorius*
SMM10702	6/22/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/22/2024	Boreal Chickadee	*Poecile hudsonicus*
SMM10702	6/22/2024	Canada Jay	*Perisoreus canadensis*
SMM10702	6/22/2024	Cape May Warbler	*Setophaga tigrina*
SMM10702	6/22/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/22/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/22/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/22/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/22/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/22/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/22/2024	Palm Warbler	*Setophaga palmarum*
SMM10702	6/22/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/22/2024	Swainson's Thrush	*Catharus ustulatus*

Table D.2 Autonomous Recording Unit Observations

Unit ID	Date	Common Name	Scientific Name
SMM10702	6/22/2024	Tree Swallow	*Tachycineta bicolor*
SMM10702	6/22/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/22/2024	White-winged Crossbill	*Loxia leucoptera*
SMM10702	6/22/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/23/2024	American Robin	*Turdus migratorius*
SMM10702	6/23/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/23/2024	Blackpoll Warbler	*Setophaga striata*
SMM10702	6/23/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/23/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/23/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/23/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/23/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/23/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/23/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/23/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/24/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/24/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/24/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/24/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/24/2024	Yellow-rumped Warbler	*Setophaga coronata*
SMM10702	6/25/2024	American Robin	*Turdus migratorius*
SMM10702	6/25/2024	Black-and-white Warbler	*Mniotilta varia*
SMM10702	6/25/2024	Common Loon	*Gavia immer*
SMM10702	6/25/2024	Dark-eyed Junco	*Junco hyemalis*
SMM10702	6/25/2024	Fox Sparrow	*Passerella iliaca*
SMM10702	6/25/2024	Golden-crowned Kinglet	*Regulus satrapa*
SMM10702	6/25/2024	Hermit Thrush	*Catharus guttatus*
SMM10702	6/25/2024	Lincoln's Sparrow	*Melospiza lincolnii*
SMM10702	6/25/2024	Magnolia Warbler	*Setophaga magnolia*
SMM10702	6/25/2024	Northern Waterthrush	*Parkesia noveboracensis*
SMM10702	6/25/2024	Ruby-crowned Kinglet	*Corthylio calendula*
SMM10702	6/25/2024	Swainson's Thrush	*Catharus ustulatus*
SMM10702	6/25/2024	White-throated Sparrow	*Zonotrichia albicollis*
SMM10702	6/25/2024	Wilson's Warbler	*Cardellina pusilla*
SMM10702	6/25/2024	Yellow-bellied Flycatcher	*Empidonax flaviventris*
SMM10702	6/25/2024	Yellow-rumped Warbler	*Setophaga coronata*

Table D.3 Area Search Surveys

Common Name	Scientific Name	Habitat	Number	Behaviour Observed
Black-backed Woodpecker	*Picoides arcticus*	Mature Mixedwood	1	No indication of breeding
Black-capped Chickadee	*Poecile atricapillus*	Disturbed Area	2	Pair in suitable nest
Dark-eyed Junco	*Junco hyemalis*	Immature Mixedwood	1	Singing male present
Hermit Thrush	*Catharus guttatus*	Immature Mixedwood	1	No indication of breeding
Lincoln's Sparrow	*Melospiza lincolnii*	Mature Mixedwood	1	Singing male present
Northern Goshawk	*Accipiter gentilis*	Mature Mixedwood	1	No indication of breeding
Northern Waterthrush	*Parkesia noveboracensis*	Treed Bog	1	Singing male present
Rusty Blackbird	***Euphagus carolinus***	**Mature Softwood**	**1**	**Singing male present**
Spotted Sandpiper	*Actitis macularius*	Open Water	1	No indication of breeding
Spotted Sandpiper	*Actitis macularius*	Not Recorded	2	Not recorded
Swamp Sparrow	*Melospiza georgiana*	Immature Mixedwood	1	Singing male present
Tree Swallow	*Tachycineta bicolor*	Disturbed Area	1	No indication of breeding
Tree Swallow	*Tachycineta bicolor*	Not Recorded	1	No indication of breeding
Wilson's Warbler	*Cardellina pusilla*	Immature Softwood	1	Singing male present
Yellow Warbler	*Setophaga petechia*	Disturbed Area	1	Singing male present
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Immature Mixedwood	1	Singing male present
Yellow-rumped Warbler	*Setophaga coronata*	Disturbed Area	1	Singing male present

Table D.4 Incidental Observations

Common Name	Scientific Name	Date	Number
American Robin	*Turdus migratorius*	9/18/2024	1
Black-capped Chickadee	*Poecile atricapillus*	9/17/2024	1
Black-capped Chickadee	*Poecile atricapillus*	9/17/2024	1
Boreal Chickadee	*Poecile hudsonicus*	9/17/2024	1
Boreal Chickadee	*Poecile hudsonicus*	9/17/2024	1
Boreal Chickadee	*Poecile hudsonicus*	9/18/2024	1
Common Loon	*Gavia immer*	9/18/2024	1
Dark-eyed Junco	*Junco hyemalis*	9/17/2024	1
Dark-eyed Junco	*Junco hyemalis*	9/18/2024	1
Downy Woodpecker	*Dryobates pubescens*	9/18/2024	1
Evening Grosbeak	***Coccothraustes vespertinus***	**9/17/2024**	**1**
Golden-crowned Kinglet	*Regulus satrapa*	9/17/2024	1
Golden-crowned Kinglet	*Regulus satrapa*	9/17/2024	1
Golden-crowned Kinglet	*Regulus satrapa*	9/17/2024	1
Canada Jay	*Perisoreus canadensis*	9/17/2024	1
Canada Jay	*Perisoreus canadensis*	9/18/2024	5
Greater Yellowlegs	*Tringa melanoleuca*	9/18/2024	1
Hairy Woodpecker	*Dryobates villosus*	9/18/2024	1
Pine Grosbeak	*Pinicola enucleator*	9/17/2024	1
Pine Grosbeak	*Pinicola enucleator*	9/17/2024	1
Pine Grosbeak	*Pinicola enucleator*	9/17/2024	1
Pine Siskin	*Spinus pinus*	9/17/2024	1
Pine Siskin	*Spinus pinus*	9/17/2024	9
Pine Siskin	*Spinus pinus*	9/18/2024	1
Purple Finch	*Haemorhous purpureus*	9/17/2024	1
Purple Finch	*Haemorhous purpureus*	9/17/2024	1
Ruby-crowned Kinglet	*Corthylio calendula*	9/18/2024	1
Rusty Blackbird	***Euphagus carolinus***	**9/18/2024**	**2**
White-throated Sparrow	*Zonotrichia albicollis*	9/17/2024	1
White-throated Sparrow	*Zonotrichia albicollis*	9/17/2024	1
White-throated Sparrow	*Zonotrichia albicollis*	9/17/2024	1
White-throated Sparrow	*Zonotrichia albicollis*	9/18/2024	1

Appendix 6.F Bat Baseline Survey Report

FireFly
METALS

Stantec

Green Bay Ming Mine Project – 2024 Bat Baseline Survey

Final Report

March 31, 2025

Prepared for:
FireFly Metals Canada
P.O. Box 610
Baie Verte NL A0K 1B0

Prepared by:
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File Number:
121418199

Limitations

The conclusions in the Report titled Green Bay Ming Mine Project – 2024 Bat Baseline Survey are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Executive Summary

FireFly Metals Canada Ltd. is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador, Canada. The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district.

To support the development and environmental assessment of the Project, Stantec Consulting Ltd. conducted a bat acoustic monitoring program. The purpose of this survey was to gain insight regarding species, occurrence and distribution of bats within and near the Project Area.

Autonomous Recording Units (ARUs) were deployed in the study area to passively record the echolocation calls of passing bats. Wildlife Acoustics Song Meter Mini Bat ARUs were deployed in four locations between May 3 and September 24, 2024, and were programmed to record bats using standard ARU settings previously used for bat detection in this region. Recorded audio files were processed using Kaleidoscope Pro (Wildlife Acoustics; Version 5.4.8) using a built-in species classifier for bats. After auto identification, the files were visually inspected by qualified biologists, in Kaleidoscope Pro to review the accuracy of identifications or to reclassify them, as necessary, based on criteria outlined in McBurney and Segers (2021).

Active detector nights (DN) for the ARUs ranged from 91 to 144 nights during the deployment period and a combined total of 780 echolocation call sequences (bat passes) were recorded. The highest number of bat passes occurred at BT-1, where 266 bat passes were recorded over 144 DN (1.85 bat passes/DN). While the highest detection rate occurred at BT-2, where 261 bat passes were recorded over 114 DN (2.29 bat passes/DN). Fairly similarly, BT-4 had 187 bat passes recorded over 91 nights, resulting in a detector rate of 2.05 bat passes/DN. The least active detector, BT-3, recorded a total of 66 bat passes over 109 DN (0.61 bat passes/DN). The highest number of bat passes were recorded during the month of August (2.81 bat passes/DN), with August 12 recording the highest number of bat passes at a single ARU, with 38 bat passes in one night.

No low-frequency bat species were recorded during the survey. Two high-frequency species were identified during the sampling period: little brown myotis (7%, 51 bat passes) and northern myotis (2%; 18 bat passes). Echolocation call sequences manually identified as little brown myotis and northern myotis met the criteria outlined in McBurney and Segers (2021) for species identification. The remaining call sequences were manually identified as either an unconfirmed species of myotis (66%; 516 bat passes), or a high-frequency bat species (20%; 158 bat passes). There were 37 additional call sequences (5% of bat passes) classified as 'NoID' (i.e., the file appeared to contain bat calls, but the calls could not be identified to a species or common group).

The baseline data collected in 2024 provided insight to bat species occurrence and distribution near the Project and will inform future Project planning.

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Acronyms / Abbreviations

agl	above ground level
ARU	autonomous recording unit
cm	centimetre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
dbh	diameter at breast height
DN	detector nights
FireFly	FireFly Metals Canada Ltd.
GPS	Global Positioning System
kHz	kilohertz
km	kilometre
m	metre
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador *Endangered Species Act*
OPS	octaves per second
SARA	*Species at Risk Act*
Stantec	Stantec Consulting Ltd.
TMF	Tailings Management Facility

1 Introduction

FireFly Metals Canada Ltd. (FireFly) is proposing the Green Bay Ming Mine Project (the Project), which is an expansion of an existing and approved underground copper-gold mine. The Project is located on the Baie Verte Peninsula in the province of Newfoundland and Labrador (NL), Canada (Figure 1.1). The Project is located approximately 7 kilometres (km) southwest of the Town of Ming's Bight and 8 km east of the Town of Baie Verte, NL, in the Baie Verte mining district. To support the development and environmental assessment of the Project, Stantec Consulting Ltd. (Stantec) was retained by FireFly to establish presence and species composition of bats that frequent the Project Area. This report summarizes the field methods and results from the 2024 surveys.

Figure No.
1.1

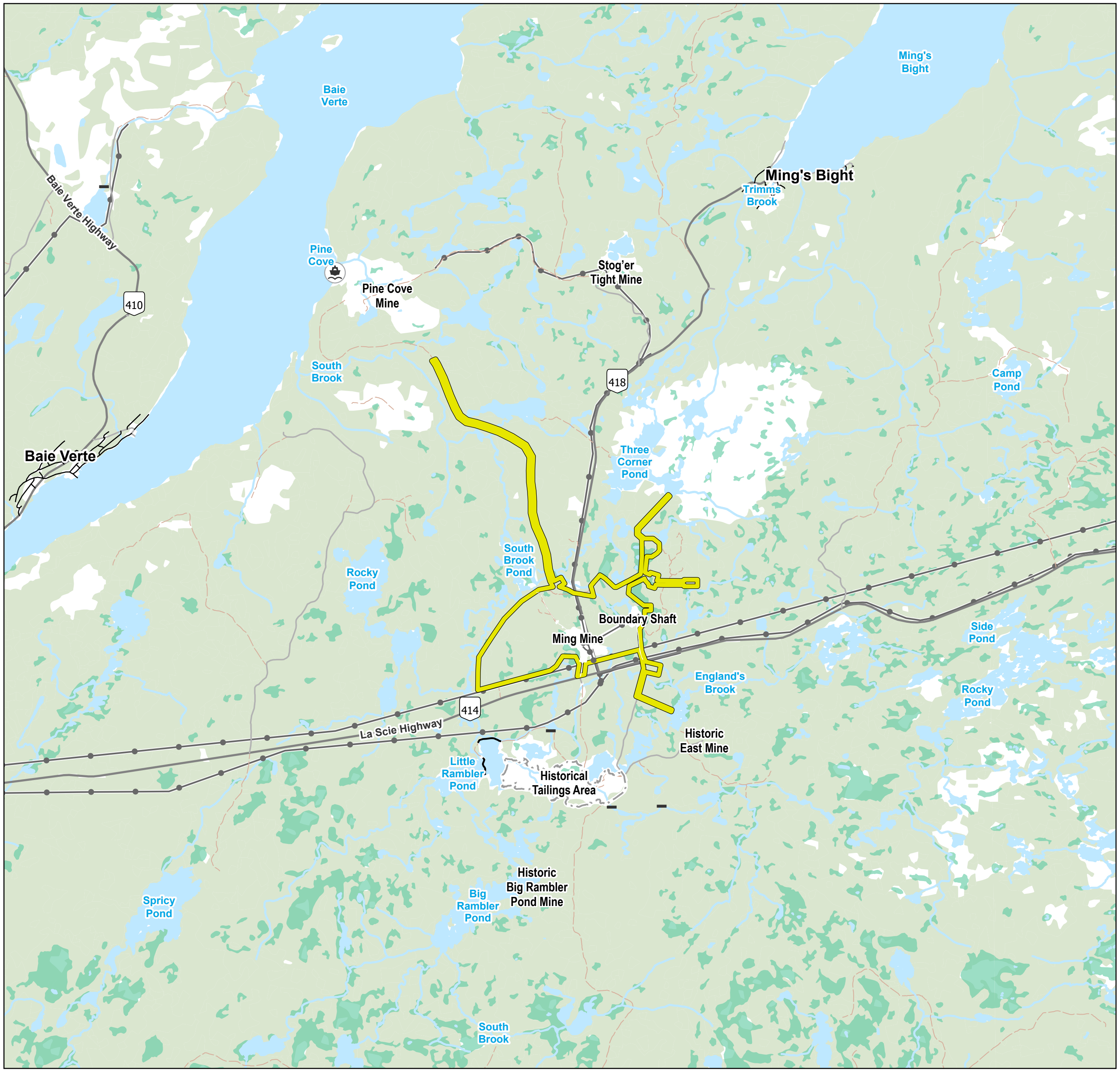
Title
Green Bay Ming Mine Project Location

Client/Project
FireFly Metals Ltd
Green Bay Ming Mine Project

121418199_008

Project Location
Baie Verte, NL

Prepared by MB on 2024-12-09
Revised 2025-03-19
TR by NW on 2025-01-07



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0 1 2 Kilometres
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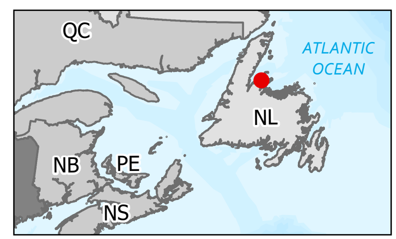
Project Area
Port
Dam
Highway
Arterial / Collector
Local Road
Resource Road / Trail
Powerline
Watercourse
Waterbody
Wetland
Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec,
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

V:\1214\active\121418199\03_data\gis_cad\gis_data\mapping\aprx\3_121418199_FFM_2024Field_OtherReporting\121418199_FFM_GreenBayCuAu_FieldReporting_Terrestrial.aprx   Revised: 2025-03-28 By: mblackwood

2 Background

2.1 Bat Species in Newfoundland

Bats that have been recorded on the Island of Newfoundland include two resident species – little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*) – and three migratory species - hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*), and silver-haired bat (*Lasionycteris noctivagans*) (Maunder 1988; Washinger et al. 2020; Aivek Stantec Limited Partnership 2021; McBurney and Segers 2021; J. Humber, personal communication dated December 15, 2023). Both species of *Myotis* were emergency listed in 2014 under Schedule 1 of the federal *Species at Risk Act* (SARA), due to sudden population declines caused by white-nose syndrome an introduced disease caused by the fungus (*Pseudogymnoascus destructans*) that affects hibernating bats. Hoary bat, eastern red bat, and silver-haired bat were recently assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, largely due to potential immediate and concerning threats from wind energy developments (COSEWIC 2023). These five species are listed as Endangered under the *Newfoundland and Labrador Endangered Species Act* (NL ESA).

Acoustic surveys using Autonomous Recording Units (ARUs; also referred to as 'detectors') are used to identify the presence of bats in an area. The ARUs passively record the echolocation calls of passing bats and the frequencies of recorded calls, in combination with other call characteristics, are used to identify a species. Bats on the Island of Newfoundland can be categorized into two general groups based on echolocation characteristics (frequencies): high frequency bat species (average frequency ≥35 kilohertz [kHz]) and low frequency bat species (average frequency 15-30 kHz) (McBurney and Segers 2021). High frequency bat species in Newfoundland include the two confirmed resident species, little brown myotis and northern myotis, as well as the migratory eastern red bat. Low frequency bat species on the Island of Newfoundland include the migratory hoary and silver-haired bats. There is also one other low-frequency species, the big brown bat (*Eptesicus fuscus),* that "has been acoustically detected [in NL] but cannot be confirmed due to uncertainty in acoustic species identification" (McBurney and Segers 2021).

3 Methods

3.1 Site Selection

Stantec conducted an acoustic monitoring program for bats from May to late September 2024. A habitat assessment was used to determine where high quality bat habitat (roosting and foraging habitat) was located within and near the Project Area. Bat detector target locations were identified based on important microhabitat features for bats (e.g., forest corridors, forest edges, waterbodies, and/or watercourses). Field placement (micro-siting) of the ARUs considered the degree of surrounding clutter, with detectors placed in relatively uncluttered environments to the extent possible (Figure 3.1). ARU deployment details (coordinates) are provided in Table 3.1.

3.2 Field Methods

Four ARUs (Wildlife Acoustics Song Meter Mini Bat Ultrasonic Recorder Units) were deployed in the vicinity of the Project (Figure 3.1; Table 3.1) between May 3 and September 24, 2024, to capture the breeding and fall migration periods. Each ARU was programed to be active from 30 minutes prior to sunset until 30 minutes after sunrise daily. ARUs were mounted on trees, approximately 2 m above ground level (agl), with microphones pointing towards available open habitat (e.g., ponds, wetlands, openings in forest interiors) and set to record when triggered by an ultrasonic signal (minimum trigger frequency of 12 kHz). The ARUs record in full spectrum, meaning that they are able to record all species of bats; additional settings (e.g., trigger frequency, recording length) were chosen based on standard settings for the species with potential to occur in this area, and on standard settings that are typically used for bat detection in this region. The ARU settings are shown in Table 3.1.

The detectors were powered by four D-size alkaline batteries which were to be replaced monthly by Stantec environmental staff and deployed with silica packs inside to limit moisture accumulation. The batteries and SD cards were swapped during visits to the site, as well as a review of detector operations and settings. During each check, the batteries were replaced, and a review of detector operations was made.

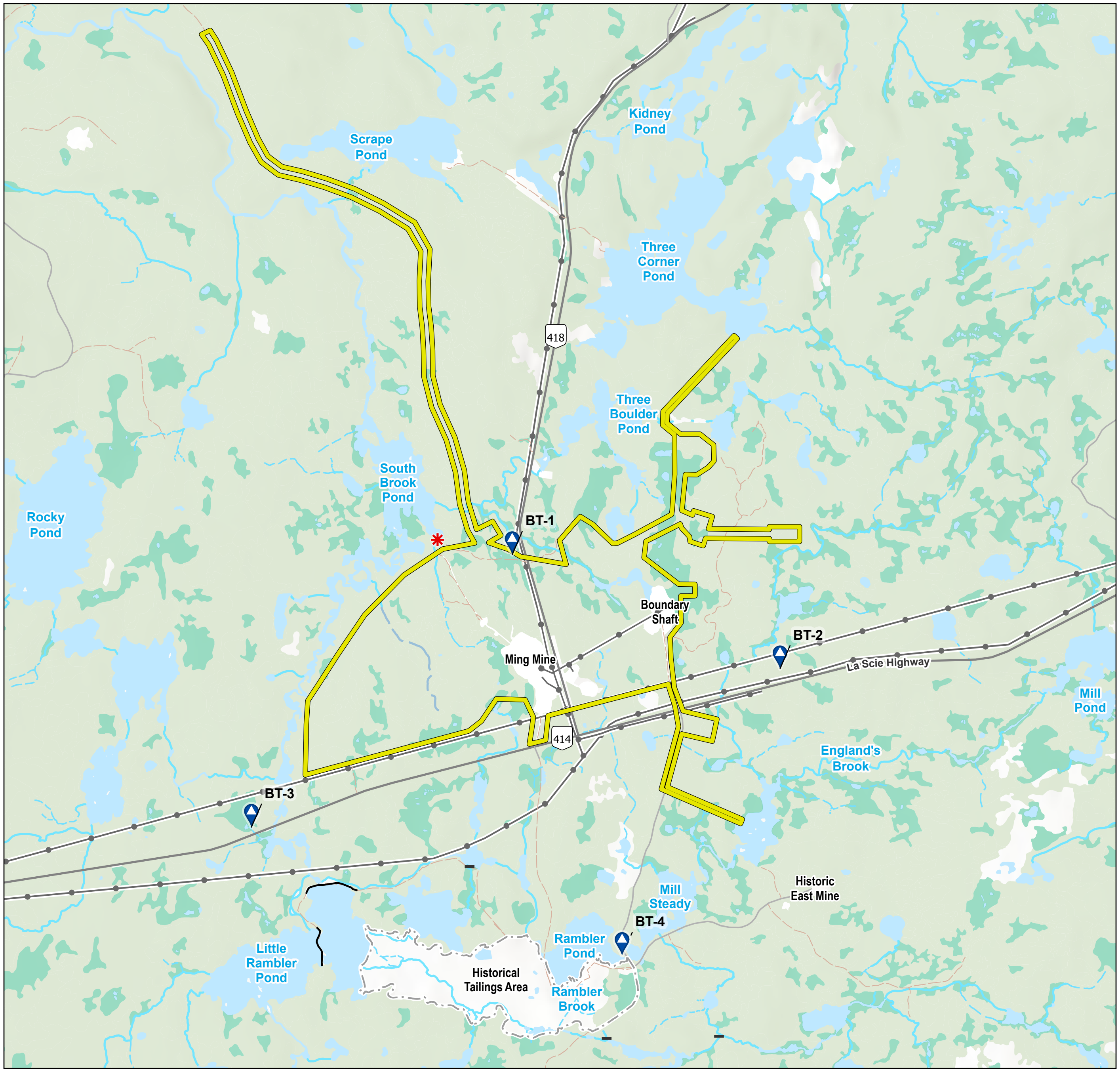


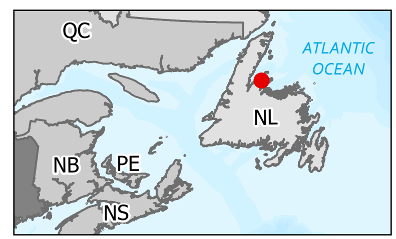
Figure No.
3.1
Title
Bat Monitoring Locations

Client/Project 121418199_6_004
FireFly Metals Ltd
Green Bay Ming Mine Project

Project Location
Baie Verte, NL
Prepared by MB on 2025-03-17

N
0 500 1,000 Metres
(At original document size of 8.5x11)
1:40,000

- Bat Monitoring Location
- Final Discharge Point (FDP)
- Project Area
- Dam
- Highway
- Arterial / Collector
- Resource Road / Trail
- Powerline
- Indeterminate Stream
- Intermittent Watercourse
- Definite Watercourse
- Wetland
- Waterbody
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: FireFly Metals Ltd, Stantec
3. Background: NRCan CanVec, GovNL, OpenStreetMap

Stantec

Table 3.1 Wildlife Acoustics Song Meter Mini Bat Detector Settings

Song Meter Mini Bat ARU Settings	
Recording format	Full-Spectrum
Sample rate	256 kHz
Minimum trigger frequency	12 kHz
Maximum length	15 seconds
Trigger window	3 seconds
Save noise?	No

3.3 Data Analysis

The audio files (.wav file format) recorded by ARUs were processed using Kaleidoscope Pro (Wildlife Acoustics; Version 5.4.8). Recordings were initially processed using a built-in species classifier for bats in Kaleidoscope Pro. The classifier sensitivity setting was set to “0” (default setting) and Newfoundland was selected in the region drop-down list. The default classifier for Newfoundland auto-identifies little brown myotis, northern myotis, and hoary bat; however, based on the potential for silver-haired bats and eastern red bats to occur in NL, these species were added to the list for auto-identification. Two other potential species, the big brown bat and tri-colored bat (*Perimyotis subflavus*), were also added to the list of species based on unconfirmed acoustic records in NL or documented ranges in adjacent provinces (McBurney and Segers 2021).

After the auto ID was run, the files were manually inspected (by visual inspection in Kaleidoscope Pro) to review the accuracy of identifications or reclassify them, as necessary, based on criteria outlined in McBurney and Segers (2021). The following approach was used when manually inspecting the files collected from the ARUs:

- Files auto-assigned to a species were manually reviewed and verified. Files classified as ‘No ID’ and a subset of files classified as ‘Noise’ were also manually reviewed and reclassified, if necessary.
- Following recommendations in McBurney and Segers (2021), call sequences with less than three discernable pulses or of poor quality (e.g., indistinct pulse characteristics) were excluded from further analysis.
- A call sequence was identified as a ‘40KMyo’ where the two myotis species (little brown myotis and northern myotis) could not be reliably distinguished.
- Call sequences with non-search phase calls (e.g., social calls) and/or in high clutter habitats and lacking distinctive species characteristics were classified as high-frequency unknown (HighF; ≥ 35 kHz).

- Call sequences meeting the parameters to identify as a potential bat species (e.g., ≥3 pulses in zero cross characteristic of a bat) that could not be identified to a species or common group (e.g., due to background noise) were classified as 'NoID'.
- The files were quality reviewed by an experienced Stantec biologist.

Echolocation sequences attributed to bat species do not equate to the number of individuals present on site (e.g., one individual bat may be recorded multiple times the same night if it frequently flies by the ARU); however, the number of calls detected provides insight into the relative level of activity in a location. As such, the date, time, and location information of manually identified / verified bats were extracted to determine the temporal pattern of echolocation activity for each bat species / species group detected during the sampling period.

4 Results

4.1 Habitat

Four ARUs were deployed in the vicinity of the Project (Figure 3.1). The ARUs were deployed on medium sized trees (approximately 10 to 20 centimetres [cm] diameter at breast height [dbh]) at or near the targeted global positioning system (GPS) location, approximately at 2 m agl. A summary of the four detector locations and their surrounding habitat is presented in Table 4.1. Photos of the ARU deployment are provided in Appendix A.

Table 4.1 Bat Detector Details

Detector ID	General Location[1]	Habitat Characteristics[2]	Deployment Details[3]
BT-1 (SMU08084)	North corner of proposed tailings management facility (TMF) on route 418 (north of Ming Mine Site)	Mapped Habitat Type: Wetland - Bog Accessed along Route 418, located on the northeastern edge of bog	Detector attached to a tree (~2m agl) with microphone facing the bog
BT-2 (SMU01234[4] SMU01892)	South of proposed explosives storage along the existing power line (east of Ming Mine Site)	Mapped Habitat Type: Overmature softwood Located along an ATV trail from La Scie Highway to transmission line, surrounded by balsam fir (*Abies balsamea*) forest	Detector attached to a tree (~2m agl) with microphone facing a small trail of the forest interior
BT-3 (SMU03803)	Southwest corner of the proposed TMF along route 414 (west of Ming Mine Site)	Mapped Habitat Type: Wetland - Bog Accessed west of Ming Mine along LA Scie highway, placed along eastern edge of bog	Detector attached to a tree (~2m agl) with microphone facing towards the bog
BT-4 (SMU03060)	Old Rambler Consolidated Pond (south of Ming Mine Site)	Mapped Habitat Type: Disturbed area / Unknown Forest Located in an old burn site, Pond facing near historical tailings area	Detector attached to a tree (~2m agl) on an old burn site, with microphone facing out over a pond

Notes:
1. Locations are shown in Figure 3-1. Additional deployment details are provided in Appendix B.
2. Images of deployment habitats are provided in Appendix A.
3. agl = above ground level
4. Unit was replaced during the deployment period due to water damage.

4.2 Survey Effort and Recorded Bat Passes

The four ARUs were deployed on May 3 and recorded until September 24, 2024. Dates of deployment, active detector nights (DN), and recorded echolocation sequences are summarized in Table 4.2. The active DN varied between ARUs and ranged from 67 to 124 nights. These differences were caused by technical issues with the ARUs (e.g., depleted batteries and water damage).

In total, 780 echolocation call sequences (also referred to as 'bat passes') were recorded by the four ARUs (Table 3.2). Highest echolocation recordings occurred at both BT-1 and BT-2, accounting for 266 (34%) and 261 (33%) of all recordings, respectively. BT-1 had a detection rate (bat passes/DN) of 1.85 bat passes/DN while BT-2 had a detection rate of 2.29 bat passes/DN. Detector BT-3 had the lowest recordings, accounting for 8% (66 recordings) of all recordings; this ARU had a detection rate of 0.61 bat passes/DN and the lowest number of echolocation sequences within a single night, at five recordings on June 15. Detector BT-4 had 187 (24%) echolocation sequences recorded, accounting for a detection rate of 2.05 bat passes/DN. The highest number of echolocation sequences recorded during the deployment period across all ARUs was at detector BT-1, with 38 recordings on the night of August 12.

Table 4.2 Summary of Detector Deployment Dates and Recorded Bat Passes: 2024 Bat Survey

Detector ID[1]	Deployment Date	Retrieval Date	Missing Dates (Detector not recording)	Sampling Effort (DN[2])	Recorded Bat Passes[3]	Detection Rate (Bat Passes / DN)	Maximum Bat Passes Recorded in One Night
BT-1	May 3	Sep 24	-[4]	144	266	1.85	38
BT-2	May 3	Sep 24	May 10 to May 27; Sep 11 to Sep 24	114	261	2.29	11
BT-3	May 3	Sep 24	Jun 26 to Jul 30	109	66	0.61	5
BT-4	Jun 25	Sep 24	-	91	187	2.05	11
			Overall	**458**	**780**	**1.70**	**-**

Notes
1. Locations are shown in Figure 3-1
2. DN = detector nights
3. Based on manual verification
4. "-" no missing dates

4.3 Bat Species Recorded

Results of the 2024 acoustic monitoring program are provided in Table 4.3. Results are shown as standard units (bat passes/DN), to account for the variation in recording nights between the ARUs. More detailed results are available in Appendix C.

Of the 780 echolocation sequences, 743 (95%) were able to be identified to species or a species group (Appendix C, Table C.1). The remaining 37 call sequences (5%) were classified as 'NoID' (i.e., the file appeared to contain bat calls, but the calls could not be identified to a species or common group). As per the difficulties in differentiating between the echolocation calls of little brown myotis and northern myotis (McBurney and Segers 2021), most myotis calls were classified as 40KMyo (i.e., either little brown myotis or northern myotis; 516 calls, or 66% of recorded echolocation sequences). An additional 158 (20%) echolocation sequences were identified as HighF (high frequency unknown), due to the low quality of the calls. No low frequency species were recorded (i.e., hoary bat, silver-haired bat, or big brown bat). It is important to note that echolocation sequences do not equate to the number of bats at a site; one individual bat may be recorded multiple times the same night if it frequently flies by the ARU.

As indicated, most recorded bat passes were categorized as 40KMyo, with a detection rate of 1.13 bat passes/DN (Table 4.3). The next largest category of bats was HighF bat species (0.34 bat passes/DN), followed by little brown myotis (0.11 bat passes/DN) and northern myotis (0.04 bat passes/DN) (Table 4.3). Call sequences classified as NoID had a detection rate of 0.08 bat passes/DN (Table 4.3).

Table 4.3 Summary of Bat Species / Species Group Recorded by Detector Location: 2024 Bat Survey

Detector ID[1]	DN[2]	Detection Rate[3,4] (Bat Passes/DN)					
		40KMyo	HighF	Little brown myotis	Northern myotis	NoID	Overall
BT-1	144	1.43	0.19	0.19	0.02	0.01	**1.85**
BT-2	114	1.46	0.66	-[5]	-	0.18	**2.29**
BT-3	109	0.43	0.06	0.09	0.01	0.02	**0.61**
BT-4	91	1.07	0.55	0.14	0.15	0.14	**2.05**
Overall	**458**	**1.13**	**0.34**	**0.11**	**0.04**	**0.08**	**1.70**

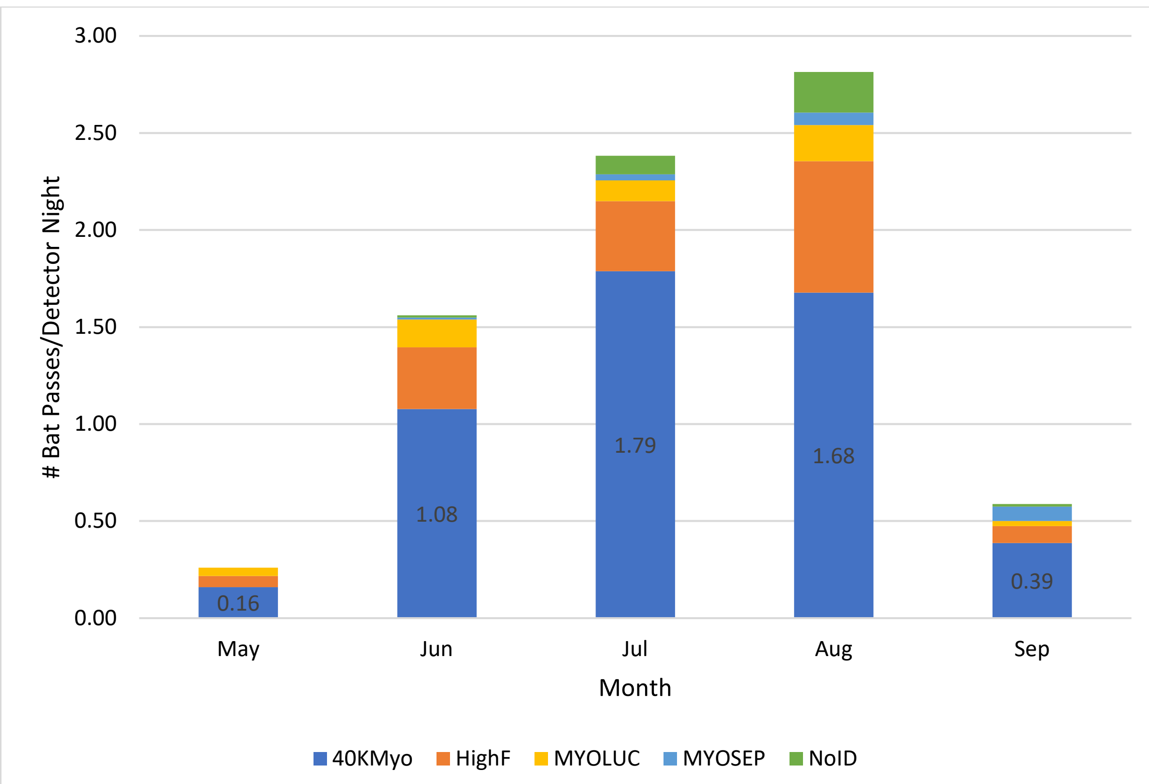
Notes
1. Locations are shown in Figure 3-1; TMF = Tailings Management Facility
2. DN = detector nights
3. 40KMyo = myotis species; HighF = high frequency unknown; NoID = unknown bat
4. Based on manual verification

"-" no data

Echolocation call sequences manually identified as MYOLUC (*Myotis lucifugus* [little brown myotis]) met the criteria outlined in McBurney and Segers (2021), with a characteristic slope between 50 and 80 octaves per second (OPS) and characteristic frequency of 35–45 kHz. Similarly, echolocation call sequences manually identified as MYOSEP (*Myotis septentrionalis* [northern myotis]) met the criteria outlined in McBurney and Segers (2021), with a characteristic slope between >200 OPS and a characteristic frequency of 35–45 kHz. Echolocation call sequences classified as HighF included call sequences with non-search phase calls (e.g., social calls) and/or that lacked distinctive species characteristics.

4.4 Temporal Activity Patterns

Bat activity varies seasonally. Results for seasonal bat activity, by species, are summarized shown in Figure 4.1, as the number of bat passes/DN. The highest detection rate was in August (2.81 bat passes/DN), which is approximately 3-4 weeks after the birth of young bats, coinciding with when they become volant (i.e., able to fly independently) and when adult bats leave their summer colonies (McBurney and Segers 2021). June and July, the breeding season, had the next highest recorded bat activity, with 1.56 and 2.38 bat passes/DN, respectively. However, one of the four ARUs, BT-2, was not recording during the entire month of July due to ARU technical issues that were resolved upon the subsequent maintenance check, which resulted in a less accurate detection rate and therefore less accurate representation of overall bat activity during the month of July. Relatively fewer bat passes were recorded during the months of May (0.26 bat passes/DN) and September (0.59 bat passes/DN). The last recorded bat pass occurred on September 23 at BT-1, the ARU with the highest overall detection rate.



Note:
ARUs were deployed from May 3 – September 24, 2024. Not all ARUs were actively recording throughout this period. Refer to Table 4-2 for a summary of deployment periods and missing dates for each ARU.
Species Coding / Grouping:
40KMyo (myotis species), HighF (high frequency unknown), MYOLUC (little brown myotis), MYOSEP (northern myotis), NoID (unknown bat).

Figure 4.1 Acoustic Results by Month and Species / Species Group

5 Summary and Conclusions

Two bat species were identified through review of the 2024 acoustic data: little brown myotis and northern myotis. These species are considered high-frequency bat species and are both listed as Endangered under the NL ESA and/or SARA.

A total of 780 echolocation sequences (bat passes) were recorded during the May 3 to September 24 deployment period in 2024. A conservative approach was taken in differentiating between the myotis species, resulting in most (66%) of the echolocation call sequences recorded in 2024 being identified as a 40KMyo (i.e., either little brown myotis or northern myotis) rather than identified to a species. However, 7% (51 call sequences) of bat passes were able to be identified specifically as little brown myotis, and 2% (18 call sequences) of bat passes as northern myotis. The remaining bat passes were classified as an unidentified high frequency bat (HighF; 20% of bat passes, 158 call sequences) or were not able to be classified beyond being a bat (NoID; 5% of bat passes, 37 call sequences).

The majority of bat passes in 2024 were detected in August, which coincides with the period when young bats become volant (approximately 3–4 weeks after birth) and when bats leave their summer colonies (McBurney and Segers 2021), however bat call sequences were recorded during each month throughout the deployment period. Most bat passes were recorded at BT-1, where the detector was mounted on a tree near the edge of a bog (photos provided in Appendix A).

The 2024 Bat Survey was the first year of bat monitoring for the Green Bay Ming Mine Project, and as such, was designed to gather information on bat species presence in the Project Area and vicinity. Two species of bat, little brown myotis, and northern myotis, were identified in or near the Project Area in 2024. FireFly is committed to additional bat (ARU) monitoring in the Project Area.

6 References

6.1 Personal Communication

Humber, Jessica. 2023. Ecosystems Management Ecologist (Endangered Species & Biodiversity). Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture, Wildlife Division. Meeting with Stantec Consulting Ltd, December 15, 2023.

6.2 Literature Cited

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COSEWIC. 2023. COSEWIC assessment and status report on the Hoary Bat *Lasiurus cinereus*, Eastern Red Bat *Lasiurus borealis* and Silver-haired Bat, *Lasionycteris noctivagans*, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. xxi + 100 pp. Available online at: https://publications.gc.ca/collections/collection_2024/eccc/cw69/CW69-14-829-2023-eng.pdf html Accessed December 2024.

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Washinger, D.P., R. Reid, and E.E. Fraser. 2020. Acoustic Evidence of Hoary Bats (*Lasiurus cinereus*) on Newfoundland, Canada. Northeastern Naturalist, 27(3): 567-575.

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Appendices

Appendix A Photos of Bat Detector Deployment

Photo A.1 Bat detector BT-1 (North corner of the TMF on route 418)

Photo A.2 Bat detector BT-2 (South of explosives storage along the power line)

Photo A.3 Bat detector BT-3 (Southwest corner of the TMF along route 414)

Photo A.4 Bat detector BT-4 (Rambler Pond)

Appendix B ARU Deployment Details

Table B.1 2024 ARU Deployment Details

Detector ID	Latitude	Longitude	Habitat and General Location[1]	Sampling Effort (DN[2])	Recorded Echolocation Sequences (Manual ID)	Detection Rate (bat passes / DN)
BT-1	49.920897	-56.087858	• Wetland – bog • North corner of proposed TMF on route 418 (north of Ming Mine Site)	144	266	1.85
BT-2	49.913841	-56.063068	• Overmature softwood • South of proposed explosives storage along the existing power line (east of Ming Mine Site)	114	261	2.29
BT-3	49.904712	-56.112428	• Wetland - bog • Southwest corner of the proposed TMF along route 414 (west of Ming Mine Site)	109	66	0.61
BT-4	49.896743	-56.078093	• Disturbed area / unknown forest • Old Rambler Consolidated Pond (south of Ming Mine Site)	91	187	2.05
			Total	**458**	**780**	**1.70**

Notes:
1. TMF = Tailings Management Facility
2. DN = detector nights

Appendix C Recorded Call Activity

Table C.1 Summary of Seasonal Call Activity by Species / Species Group

Month	Total Bat Passes by Species / Species Group (Manual Species Identification)[1]					
	40KMyo	HighF	MYOLUC	MYOSEP	NoID	Total
May	11	4	3	-[2]	-	**18**
June	98	29	13	1	1	**142**
July	168	34	10	3	9	**224**
August	208	84	23	8	26	**349**
September	31	7	2	6	1	**47**
Total	**516**	**158**	**51**	**18**	**37**	**780**
% of Total Bat Passes	**66%**	**20%**	**7%**	**2%**	**5%**	**100%**

Notes:
1. Species Coding/Grouping: 40KMyo (myotis species), HighF (high frequency unknown), MYOLUC (little brown myotis), MYOSEP (northern myotis), NoID (unknown bat)
2. “-" no data

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240520_010806.wav	20-May	1:08:06	55	39.515	102.17	40KMyo
BT-1	SMU08084_20240521_232717.wav	21-May	23:27:17	31	38.93	82.98	40KMyo
BT-1	SMU08084_20240522_233335.wav	22-May	23:33:35	18	37.653	40.19	MYOLUC
BT-1	SMU08084_20240531_020002.wav	31-May	2:00:02	29	37.429	61.49	MYOLUC
BT-1	SMU08084_20240603_042403.wav	3-Jun	4:24:03	43	40.076	110.29	40KMyo
BT-1	SMU08084_20240608_040057.wav	8-Jun	4:00:57	53	40.289	63.78	40KMyo
BT-1	SMU08084_20240609_220835.wav	9-Jun	22:08:35	61	42.066	156.39	40KMyo
BT-1	SMU08084_20240610_220134.wav	10-Jun	22:01:34	148	41.572	91.14	40KMyo
BT-1	SMU08084_20240610_015857.wav	10-Jun	1:58:57	28	37.974	43.35	HighF
BT-1	SMU08084_20240610_220310.wav	10-Jun	22:03:10	20	43.393	41.04	HighF
BT-1	SMU08084_20240610_220047.wav	10-Jun	22:00:47	6	42.018	65.27	HighF
BT-1	SMU08084_20240610_220247.wav	10-Jun	22:02:47	61	40.113	56.5	MYOLUC
BT-1	SMU08084_20240611_041217.wav	11-Jun	4:12:17	110	41.044	77.18	40KMyo
BT-1	SMU08084_20240611_041233.wav	11-Jun	4:12:33	100	41.142	92.75	MYOLUC
BT-1	SMU08084_20240611_041307.wav	11-Jun	4:13:07	15	43.468	67.05	NoID
BT-1	SMU08084_20240613_221741.wav	13-Jun	22:17:41	42	41.409	94.88	40KMyo
BT-1	SMU08084_20240614_033527.wav	14-Jun	3:35:27	21	37.319	23.8	40KMyo
BT-1	SMU08084_20240614_034535.wav	14-Jun	3:45:35	22	39.168	50.76	40KMyo
BT-1	SMU08084_20240614_221359.wav	14-Jun	22:13:59	59	40.784	78.21	40KMyo
BT-1	SMU08084_20240614_004917.wav	14-Jun	0:49:17	21	39.239	36.69	40KMyo
BT-1	SMU08084_20240616_220522.wav	16-Jun	22:05:22	58	42.69	103.98	40KMyo
BT-1	SMU08084_20240616_220535.wav	16-Jun	22:05:35	40	42.25	68.93	40KMyo
BT-1	SMU08084_20240616_220438.wav	16-Jun	22:04:38	47	43.839	161.17	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240616_042230.wav	16-Jun	4:22:30	18	40.032	-5.56	HighF
BT-1	SMU08084_20240618_223701.wav	18-Jun	22:37:01	43	37.966	39.14	40KMyo
BT-1	SMU08084_20240618_221421.wav	18-Jun	22:14:21	129	39.933	86.11	40KMyo
BT-1	SMU08084_20240618_221148.wav	18-Jun	22:11:48	118	40.531	88.4	40KMyo
BT-1	SMU08084_20240618_221406.wav	18-Jun	22:14:06	128	41.214	87.06	40KMyo
BT-1	SMU08084_20240618_221337.wav	18-Jun	22:13:37	76	40.089	82.93	40KMyo
BT-1	SMU08084_20240618_221219.wav	18-Jun	22:12:19	71	41.16	128.68	40KMyo
BT-1	SMU08084_20240618_221206.wav	18-Jun	22:12:06	71	41.238	97.81	40KMyo
BT-1	SMU08084_20240618_221355.wav	18-Jun	22:13:55	54	46.792	100.51	40KMyo
BT-1	SMU08084_20240618_221436.wav	18-Jun	22:14:36	46	39.936	102.43	40KMyo
BT-1	SMU08084_20240618_221228.wav	18-Jun	22:12:28	83	42.249	102.76	40KMyo
BT-1	SMU08084_20240618_221120.wav	18-Jun	22:11:20	15	41.407	58.36	40KMyo
BT-1	SMU08084_20240618_221327.wav	18-Jun	22:13:27	18	42.889	116.13	HighF
BT-1	SMU08084_20240618_221306.wav	18-Jun	22:13:06	80	41.575	74.75	MYOLUC
BT-1	SMU08084_20240619_223558.wav	19-Jun	22:35:58	123	40.325	95.16	40KMyo
BT-1	SMU08084_20240619_223429.wav	19-Jun	22:34:29	136	41.576	88.32	40KMyo
BT-1	SMU08084_20240619_223504.wav	19-Jun	22:35:04	111	40.547	83.14	40KMyo
BT-1	SMU08084_20240619_231420.wav	19-Jun	23:14:20	47	37.204	112.37	40KMyo
BT-1	SMU08084_20240619_223520.wav	19-Jun	22:35:20	14	44.184	-20.46	HighF
BT-1	SMU08084_20240619_223451.wav	19-Jun	22:34:51	52	41.028	84.48	MYOLUC
BT-1	SMU08084_20240619_224925.wav	19-Jun	22:49:25	41	39.201	7.94	MYOLUC
BT-1	SMU08084_20240619_223613.wav	19-Jun	22:36:13	24	40.116	59.07	MYOLUC
BT-1	SMU08084_20240619_223549.wav	19-Jun	22:35:49	52	39.356	71.87	MYOLUC

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240620_223336.wav	20-Jun	22:33:36	64	40.502	66.98	40KMyo
BT-1	SMU08084_20240620_035129.wav	20-Jun	3:51:29	44	40.058	79.03	40KMyo
BT-1	SMU08084_20240620_032039.wav	20-Jun	3:20:39	42	40.161	62.58	40KMyo
BT-1	SMU08084_20240629_225041.wav	29-Jun	22:50:41	13	40.227	40.53	MYOLUC
BT-1	SMU08084_20240703_230908.wav	3-Jul	23:09:08	86	38.209	58.74	40KMyo
BT-1	SMU08084_20240703_230808.wav	3-Jul	23:08:08	46	38.2	38.66	40KMyo
BT-1	SMU08084_20240703_010344.wav	3-Jul	1:03:44	46	41.798	103.38	40KMyo
BT-1	SMU08084_20240705_222718.wav	5-Jul	22:27:18	24	39.373	46.54	40KMyo
BT-1	SMU08084_20240706_004241.wav	6-Jul	0:42:41	48	43.352	111.21	40KMyo
BT-1	SMU08084_20240708_222212.wav	8-Jul	22:22:12	98	39.076	67.15	40KMyo
BT-1	SMU08084_20240708_224312.wav	8-Jul	22:43:12	59	41.147	41.66	40KMyo
BT-1	SMU08084_20240708_222039.wav	8-Jul	22:20:39	44	40.031	32.53	40KMyo
BT-1	SMU08084_20240709_003045.wav	9-Jul	0:30:45	39	42.322	54.83	40KMyo
BT-1	SMU08084_20240711_221529.wav	11-Jul	22:15:29	132	41.021	100.42	40KMyo
BT-1	SMU08084_20240711_005305.wav	11-Jul	0:53:05	37	40.907	157.13	HighF
BT-1	SMU08084_20240711_220559.wav	11-Jul	22:05:59	94	41.49	88.75	MYOLUC
BT-1	SMU08084_20240712_002151.wav	12-Jul	0:21:51	28	41.779	79.79	HighF
BT-1	SMU08084_20240712_224907.wav	12-Jul	22:49:07	62	40.971	35.54	HighF
BT-1	SMU08084_20240714_233837.wav	14-Jul	23:38:37	22	46.427	74.78	40KMyo
BT-1	SMU08084_20240715_013733.wav	15-Jul	1:37:33	36	38.755	9.88	40KMyo
BT-1	SMU08084_20240716_232744.wav	16-Jul	23:27:44	39	38.778	61.86	MYOLUC
BT-1	SMU08084_20240718_041435.wav	18-Jul	4:14:35	149	42.614	106.35	40KMyo
BT-1	SMU08084_20240718_041338.wav	18-Jul	4:13:38	151	43.5	156.23	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240718_041306.wav	18-Jul	4:13:06	122	42.408	135.72	40KMyo
BT-1	SMU08084_20240718_041053.wav	18-Jul	4:10:53	39	41.722	122.31	40KMyo
BT-1	SMU08084_20240718_041102.wav	18-Jul	4:11:02	35	41.571	128.98	40KMyo
BT-1	SMU08084_20240718_041219.wav	18-Jul	4:12:19	38	41.568	144.9	40KMyo
BT-1	SMU08084_20240718_041212.wav	18-Jul	4:12:12	20	42.569	116.04	40KMyo
BT-1	SMU08084_20240718_041116.wav	18-Jul	4:11:16	7	42.546	145.9	40KMyo
BT-1	SMU08084_20240718_041120.wav	18-Jul	4:11:20	45	41.321	146.79	40KMyo
BT-1	SMU08084_20240718_041240.wav	18-Jul	4:12:40	73	41.166	142.53	40KMyo
BT-1	SMU08084_20240720_224205.wav	20-Jul	22:42:05	30	40.215	94.83	40KMyo
BT-1	SMU08084_20240723_033733.wav	23-Jul	3:37:33	146	43.174	147.46	40KMyo
BT-1	SMU08084_20240723_033214.wav	23-Jul	3:32:14	144	40.782	123.55	40KMyo
BT-1	SMU08084_20240723_033811.wav	23-Jul	3:38:11	134	41.675	131.97	40KMyo
BT-1	SMU08084_20240723_033702.wav	23-Jul	3:37:02	155	41.371	145.13	40KMyo
BT-1	SMU08084_20240723_033301.wav	23-Jul	3:33:01	123	42.279	166.22	40KMyo
BT-1	SMU08084_20240723_033316.wav	23-Jul	3:33:16	147	42.273	178.3	40KMyo
BT-1	SMU08084_20240723_033045.wav	23-Jul	3:30:45	132	43.252	153.83	40KMyo
BT-1	SMU08084_20240723_033552.wav	23-Jul	3:35:52	134	41.294	142.1	40KMyo
BT-1	SMU08084_20240723_033755.wav	23-Jul	3:37:55	153	42.82	164.89	40KMyo
BT-1	SMU08084_20240723_033331.wav	23-Jul	3:33:31	119	41.584	115.3	40KMyo
BT-1	SMU08084_20240723_033159.wav	23-Jul	3:31:59	114	45.509	116.61	40KMyo
BT-1	SMU08084_20240723_033146.wav	23-Jul	3:31:46	84	40.974	122.9	40KMyo
BT-1	SMU08084_20240723_033100.wav	23-Jul	3:31:00	93	40.837	108.1	40KMyo
BT-1	SMU08084_20240723_033608.wav	23-Jul	3:36:08	60	40.968	127.46	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240723_033826.wav	23-Jul	3:38:26	70	43.536	159.11	40KMyo
BT-1	SMU08084_20240723_033621.wav	23-Jul	3:36:21	73	41.013	141.73	40KMyo
BT-1	SMU08084_20240723_033852.wav	23-Jul	3:38:52	41	39.83	84.71	40KMyo
BT-1	SMU08084_20240723_033235.wav	23-Jul	3:32:35	60	40.955	127.02	40KMyo
BT-1	SMU08084_20240723_032931.wav	23-Jul	3:29:31	50	40.17	107.89	40KMyo
BT-1	SMU08084_20240723_033023.wav	23-Jul	3:30:23	48	40.406	138.5	40KMyo
BT-1	SMU08084_20240723_033004.wav	23-Jul	3:30:04	66	40.737	124.61	40KMyo
BT-1	SMU08084_20240723_033016.wav	23-Jul	3:30:16	27	42.143	102.2	40KMyo
BT-1	SMU08084_20240723_033248.wav	23-Jul	3:32:48	27	42.052	144.78	40KMyo
BT-1	SMU08084_20240723_032949.wav	23-Jul	3:29:49	168	42.702	187.55	40KMyo
BT-1	SMU08084_20240723_033129.wav	23-Jul	3:31:29	22	42.065	118.18	40KMyo
BT-1	SMU08084_20240723_033254.wav	23-Jul	3:32:54	12	43.853	200.6	40KMyo
BT-1	SMU08084_20240723_033647.wav	23-Jul	3:36:47	145	42.43	165.14	40KMyo
BT-1	SMU08084_20240723_033842.wav	23-Jul	3:38:42	31	41.366	57.4	MYOLUC
BT-1	SMU08084_20240723_033537.wav	23-Jul	3:35:37	149	43.463	192.53	MYOSEP
BT-1	SMU08084_20240724_002026.wav	24-Jul	0:20:26	39	45.481	57.48	HighF
BT-1	SMU08084_20240725_040410.wav	25-Jul	4:04:10	92	42.143	115.01	40KMyo
BT-1	SMU08084_20240725_040359.wav	25-Jul	4:03:59	60	41.691	151.49	40KMyo
BT-1	SMU08084_20240725_235116.wav	25-Jul	23:51:16	33	39.412	114.41	40KMyo
BT-1	SMU08084_20240725_040441.wav	25-Jul	4:04:41	42	41.738	118.25	40KMyo
BT-1	SMU08084_20240725_220019.wav	25-Jul	22:00:19	25	43.075	36.61	40KMyo
BT-1	SMU08084_20240728_041235.wav	28-Jul	4:12:35	119	40.806	119.38	40KMyo
BT-1	SMU08084_20240728_035129.wav	28-Jul	3:51:29	138	43.004	130.69	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240728_034154.wav	28-Jul	3:41:54	78	42.443	138.97	40KMyo
BT-1	SMU08084_20240728_035114.wav	28-Jul	3:51:14	121	44.857	148.74	40KMyo
BT-1	SMU08084_20240728_041037.wav	28-Jul	4:10:37	96	41.667	105.26	40KMyo
BT-1	SMU08084_20240728_041135.wav	28-Jul	4:11:35	66	41.456	113.28	40KMyo
BT-1	SMU08084_20240728_040956.wav	28-Jul	4:09:56	50	40.096	52.22	40KMyo
BT-1	SMU08084_20240728_041204.wav	28-Jul	4:12:04	75	42.17	163.96	40KMyo
BT-1	SMU08084_20240728_034927.wav	28-Jul	3:49:27	63	43.141	178.65	40KMyo
BT-1	SMU08084_20240728_023541.wav	28-Jul	2:35:41	37	42.229	100.69	40KMyo
BT-1	SMU08084_20240728_034207.wav	28-Jul	3:42:07	24	40.595	94.98	40KMyo
BT-1	SMU08084_20240728_034548.wav	28-Jul	3:45:48	49	42.909	133.62	40KMyo
BT-1	SMU08084_20240728_034846.wav	28-Jul	3:48:46	26	41.987	124.5	40KMyo
BT-1	SMU08084_20240728_041304.wav	28-Jul	4:13:04	20	41.575	120.7	40KMyo
BT-1	SMU08084_20240728_041155.wav	28-Jul	4:11:55	20	43.65	160.5	40KMyo
BT-1	SMU08084_20240728_041146.wav	28-Jul	4:11:46	33	42.118	136.86	40KMyo
BT-1	SMU08084_20240728_041311.wav	28-Jul	4:13:11	45	42.17	189.44	40KMyo
BT-1	SMU08084_20240728_233248.wav	28-Jul	23:32:48	13	40.24	29.74	HighF
BT-1	SMU08084_20240728_041007.wav	28-Jul	4:10:07	51	43.012	63.17	HighF
BT-1	SMU08084_20240728_034853.wav	28-Jul	3:48:53	19	42.236	130.63	HighF
BT-1	SMU08084_20240728_034228.wav	28-Jul	3:42:28	28	41.776	127.84	HighF
BT-1	SMU08084_20240728_035144.wav	28-Jul	3:51:44	18	40.931	156.19	HighF
BT-1	SMU08084_20240728_040952.wav	28-Jul	4:09:52	6	40.883	78.48	MYOLUC
BT-1	SMU08084_20240728_035034.wav	28-Jul	3:50:34	53	43.788	213.92	MYOSEP
BT-1	SMU08084_20240731_043029.wav	31-Jul	4:30:29	60	40.146	65.23	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240731_041103.wav	31-Jul	4:11:03	85	46.21	410.31	40KMyo
BT-1	SMU08084_20240731_041417.wav	31-Jul	4:14:17	43	46.39	345.66	40KMyo
BT-1	SMU08084_20240731_011803.wav	31-Jul	1:18:03	15	38.91	30	HighF
BT-1	SMU08084_20240801_232004.wav	1-Aug	23:20:04	46	41.684	57.54	HighF
BT-1	SMU08084_20240801_041647.wav	1-Aug	4:16:47	29	38.316	189.36	NoID
BT-1	SMU08084_20240803_041619.wav	3-Aug	4:16:19	111	42.556	123.58	40KMyo
BT-1	SMU08084_20240803_041802.wav	3-Aug	4:18:02	107	43.253	146.9	40KMyo
BT-1	SMU08084_20240803_023854.wav	3-Aug	2:38:54	54	41.657	121.13	40KMyo
BT-1	SMU08084_20240803_041634.wav	3-Aug	4:16:34	61	41.24	142.42	40KMyo
BT-1	SMU08084_20240803_042526.wav	3-Aug	4:25:26	35	41.23	157.2	40KMyo
BT-1	SMU08084_20240803_042218.wav	3-Aug	4:22:18	44	42.391	145.56	40KMyo
BT-1	SMU08084_20240803_040730.wav	3-Aug	4:07:30	37	42.207	157.25	40KMyo
BT-1	SMU08084_20240803_041600.wav	3-Aug	4:16:00	10	41.629	109.17	HighF
BT-1	SMU08084_20240804_045520.wav	4-Aug	4:55:20	86	39.985	85.74	40KMyo
BT-1	SMU08084_20240804_045236.wav	4-Aug	4:52:36	43	41.706	142.87	40KMyo
BT-1	SMU08084_20240804_044022.wav	4-Aug	4:40:22	63	42.33	99.47	40KMyo
BT-1	SMU08084_20240804_045007.wav	4-Aug	4:50:07	106	43.707	163.04	40KMyo
BT-1	SMU08084_20240804_044306.wav	4-Aug	4:43:06	42	44.835	311.6	HighF
BT-1	SMU08084_20240804_214749.wav	4-Aug	21:47:49	51	39.355	55.18	MYOLUC
BT-1	SMU08084_20240806_044211.wav	6-Aug	4:42:11	71	40.624	82.97	40KMyo
BT-1	SMU08084_20240806_044228.wav	6-Aug	4:42:28	57	40.016	123.48	40KMyo
BT-1	SMU08084_20240806_043414.wav	6-Aug	4:34:14	52	39.617	117.11	40KMyo
BT-1	SMU08084_20240806_044741.wav	6-Aug	4:47:41	48	41.456	94.31	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240806_044439.wav	6-Aug	4:44:39	46	40.422	114.83	40KMyo
BT-1	SMU08084_20240806_043832.wav	6-Aug	4:38:32	34	39.098	122.1	40KMyo
BT-1	SMU08084_20240809_213247.wav	9-Aug	21:32:47	148	41.184	106.9	40KMyo
BT-1	SMU08084_20240809_213216.wav	9-Aug	21:32:16	145	44.043	108.69	40KMyo
BT-1	SMU08084_20240809_213318.wav	9-Aug	21:33:18	124	41.567	117.17	40KMyo
BT-1	SMU08084_20240809_213848.wav	9-Aug	21:38:48	118	41.247	107.8	40KMyo
BT-1	SMU08084_20240809_213154.wav	9-Aug	21:31:54	96	40.192	64.08	40KMyo
BT-1	SMU08084_20240809_213333.wav	9-Aug	21:33:33	108	41.156	109.81	40KMyo
BT-1	SMU08084_20240809_213302.wav	9-Aug	21:33:02	122	42.324	133.81	40KMyo
BT-1	SMU08084_20240809_213350.wav	9-Aug	21:33:50	73	40.356	84.08	40KMyo
BT-1	SMU08084_20240809_213826.wav	9-Aug	21:38:26	95	41.981	126.27	40KMyo
BT-1	SMU08084_20240809_213057.wav	9-Aug	21:30:57	110	42.063	90.52	40KMyo
BT-1	SMU08084_20240809_214424.wav	9-Aug	21:44:24	81	40.405	120.44	40KMyo
BT-1	SMU08084_20240809_213141.wav	9-Aug	21:31:41	52	40.352	81.9	40KMyo
BT-1	SMU08084_20240809_215555.wav	9-Aug	21:55:55	34	43.699	63.97	40KMyo
BT-1	SMU08084_20240809_213210.wav	9-Aug	21:32:10	7	38.744	98.36	HighF
BT-1	SMU08084_20240809_213232.wav	9-Aug	21:32:32	136	40.789	100.38	MYOLUC
BT-1	SMU08084_20240809_213119.wav	9-Aug	21:31:19	66	40.399	70.89	MYOLUC
BT-1	SMU08084_20240810_214256.wav	10-Aug	21:42:56	97	41.623	113.89	40KMyo
BT-1	SMU08084_20240810_043920.wav	10-Aug	4:39:20	27	41.152	128.16	40KMyo
BT-1	SMU08084_20240810_051921.wav	10-Aug	5:19:21	37	43.427	93.82	HighF
BT-1	SMU08084_20240811_214712.wav	11-Aug	21:47:12	47	38.231	26.1	40KMyo
BT-1	SMU08084_20240811_215759.wav	11-Aug	21:57:59	101	40.02	78.25	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240811_215814.wav	11-Aug	21:58:14	59	39.866	53.99	40KMyo
BT-1	SMU08084_20240811_215743.wav	11-Aug	21:57:43	122	40.735	82.39	MYOLUC
BT-1	SMU08084_20240812_213047.wav	12-Aug	21:30:47	142	40.547	90.94	40KMyo
BT-1	SMU08084_20240812_213016.wav	12-Aug	21:30:16	155	40.467	99.78	40KMyo
BT-1	SMU08084_20240812_212757.wav	12-Aug	21:27:57	141	41.524	108.26	40KMyo
BT-1	SMU08084_20240812_212647.wav	12-Aug	21:26:47	132	40.925	96.13	40KMyo
BT-1	SMU08084_20240812_212736.wav	12-Aug	21:27:36	136	41.604	104.72	40KMyo
BT-1	SMU08084_20240812_212828.wav	12-Aug	21:28:28	130	40.462	96.99	40KMyo
BT-1	SMU08084_20240812_212813.wav	12-Aug	21:28:13	135	41.497	102.26	40KMyo
BT-1	SMU08084_20240812_212937.wav	12-Aug	21:29:37	144	41.451	112.99	40KMyo
BT-1	SMU08084_20240812_213151.wav	12-Aug	21:31:51	110	40.451	83.54	40KMyo
BT-1	SMU08084_20240812_212724.wav	12-Aug	21:27:24	96	42.495	96.08	40KMyo
BT-1	SMU08084_20240812_212953.wav	12-Aug	21:29:53	123	41.447	106.55	40KMyo
BT-1	SMU08084_20240812_212917.wav	12-Aug	21:29:17	124	41.765	135.02	40KMyo
BT-1	SMU08084_20240812_213207.wav	12-Aug	21:32:07	128	42.274	85.74	40KMyo
BT-1	SMU08084_20240812_213031.wav	12-Aug	21:30:31	111	40.974	66.44	40KMyo
BT-1	SMU08084_20240812_212905.wav	12-Aug	21:29:05	68	40.523	86.41	40KMyo
BT-1	SMU08084_20240812_045543.wav	12-Aug	4:55:43	80	40.012	84.88	40KMyo
BT-1	SMU08084_20240812_213244.wav	12-Aug	21:32:44	70	40.886	93.01	40KMyo
BT-1	SMU08084_20240812_212710.wav	12-Aug	21:27:10	54	41.56	65.57	40KMyo
BT-1	SMU08084_20240812_213117.wav	12-Aug	21:31:17	56	40.93	82.76	40KMyo
BT-1	SMU08084_20240812_213224.wav	12-Aug	21:32:24	50	39.862	76.41	40KMyo
BT-1	SMU08084_20240812_212636.wav	12-Aug	21:26:36	55	39.902	83.21	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240812_045616.wav	12-Aug	4:56:16	75	40.687	129.5	40KMyo
BT-1	SMU08084_20240812_212702.wav	12-Aug	21:27:02	42	40.574	82.83	40KMyo
BT-1	SMU08084_20240812_045708.wav	12-Aug	4:57:08	47	39.806	112.18	40KMyo
BT-1	SMU08084_20240812_212751.wav	12-Aug	21:27:51	28	39.102	90.19	40KMyo
BT-1	SMU08084_20240812_212858.wav	12-Aug	21:28:58	30	41.044	104.48	40KMyo
BT-1	SMU08084_20240812_045604.wav	12-Aug	4:56:04	47	41.649	141.37	40KMyo
BT-1	SMU08084_20240812_212932.wav	12-Aug	21:29:32	23	40.598	84.39	40KMyo
BT-1	SMU08084_20240812_213009.wav	12-Aug	21:30:09	24	38.782	88.05	40KMyo
BT-1	SMU08084_20240812_045751.wav	12-Aug	4:57:51	15	40.673	164.35	40KMyo
BT-1	SMU08084_20240812_045559.wav	12-Aug	4:55:59	17	39.673	94.65	40KMyo
BT-1	SMU08084_20240812_045635.wav	12-Aug	4:56:35	20	40.967	104.05	40KMyo
BT-1	SMU08084_20240812_212843.wav	12-Aug	21:28:43	118	41.425	84.17	HighF
BT-1	SMU08084_20240812_213136.wav	12-Aug	21:31:36	109	41.094	91.65	MYOLUC
BT-1	SMU08084_20240812_213235.wav	12-Aug	21:32:35	69	40.492	89.31	MYOLUC
BT-1	SMU08084_20240812_213109.wav	12-Aug	21:31:09	52	40.571	83.49	MYOLUC
BT-1	SMU08084_20240812_213258.wav	12-Aug	21:32:58	52	39.976	59.06	MYOLUC
BT-1	SMU08084_20240812_214238.wav	12-Aug	21:42:38	49	40.128	62.91	MYOLUC
BT-1	SMU08084_20240813_011724.wav	13-Aug	1:17:24	43	41.24	106.48	40KMyo
BT-1	SMU08084_20240813_031157.wav	13-Aug	3:11:57	14	38.784	125.69	HighF
BT-1	SMU08084_20240814_211550.wav	14-Aug	21:15:50	131	42.097	92.01	40KMyo
BT-1	SMU08084_20240814_211535.wav	14-Aug	21:15:35	128	42.451	126.37	40KMyo
BT-1	SMU08084_20240814_211520.wav	14-Aug	21:15:20	143	43.654	148.5	40KMyo
BT-1	SMU08084_20240814_211605.wav	14-Aug	21:16:05	95	41.147	95.22	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240814_211444.wav	14-Aug	21:14:44	120	43.439	133.91	40KMyo
BT-1	SMU08084_20240814_211500.wav	14-Aug	21:15:00	57	42.073	131.55	40KMyo
BT-1	SMU08084_20240815_211727.wav	15-Aug	21:17:27	70	40.944	54.1	MYOLUC
BT-1	SMU08084_20240816_211109.wav	16-Aug	21:11:09	135	40.473	113.32	40KMyo
BT-1	SMU08084_20240816_211054.wav	16-Aug	21:10:54	124	40.57	66.23	40KMyo
BT-1	SMU08084_20240816_211008.wav	16-Aug	21:10:08	126	41.565	98.26	40KMyo
BT-1	SMU08084_20240816_211024.wav	16-Aug	21:10:24	122	40.709	106.37	40KMyo
BT-1	SMU08084_20240816_211039.wav	16-Aug	21:10:39	115	41.915	97.73	40KMyo
BT-1	SMU08084_20240816_210953.wav	16-Aug	21:09:53	107	40.967	112.11	40KMyo
BT-1	SMU08084_20240816_210938.wav	16-Aug	21:09:38	132	41.613	134.07	40KMyo
BT-1	SMU08084_20240816_210923.wav	16-Aug	21:09:23	119	41.027	117.72	40KMyo
BT-1	SMU08084_20240816_211727.wav	16-Aug	21:17:27	59	41.073	80.69	40KMyo
BT-1	SMU08084_20240818_210724.wav	18-Aug	21:07:24	128	41.149	72.29	40KMyo
BT-1	SMU08084_20240818_210805.wav	18-Aug	21:08:05	130	41.81	94.8	40KMyo
BT-1	SMU08084_20240818_210739.wav	18-Aug	21:07:39	17	38.132	72.83	40KMyo
BT-1	SMU08084_20240818_210820.wav	18-Aug	21:08:20	16	38.081	52.58	40KMyo
BT-1	SMU08084_20240818_210749.wav	18-Aug	21:07:49	149	40.592	99.29	MYOLUC
BT-1	SMU08084_20240819_210306.wav	19-Aug	21:03:06	147	40.215	90.2	40KMyo
BT-1	SMU08084_20240819_210321.wav	19-Aug	21:03:21	143	41.984	103.53	40KMyo
BT-1	SMU08084_20240819_032826.wav	19-Aug	3:28:26	30	41.248	194.73	40KMyo
BT-1	SMU08084_20240819_210336.wav	19-Aug	21:03:36	51	40.557	117.97	HighF
BT-1	SMU08084_20240820_053056.wav	20-Aug	5:30:56	110	41.257	112.97	40KMyo
BT-1	SMU08084_20240820_052659.wav	20-Aug	5:26:59	66	41.484	126.69	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-1	SMU08084_20240820_051953.wav	20-Aug	5:19:53	73	41.577	110.93	HighF
BT-1	SMU08084_20240822_221346.wav	22-Aug	22:13:46	36	39.832	116.56	40KMyo
BT-1	SMU08084_20240823_001256.wav	23-Aug	0:12:56	48	46.534	258.18	MYOSEP
BT-1	SMU08084_20240824_215456.wav	24-Aug	21:54:56	15	43.724	124.81	40KMyo
BT-1	SMU08084_20240824_220616.wav	24-Aug	22:06:16	22	40.544	65.78	MYOLUC
BT-1	SMU08084_20240828_223206.wav	28-Aug	22:32:06	37	39.276	82.5	40KMyo
BT-1	SMU08084_20240828_212452.wav	28-Aug	21:24:52	30	37.524	178.34	40KMyo
BT-1	SMU08084_20240830_012046.wav	30-Aug	1:20:46	15	40.945	26.84	HighF
BT-1	SMU08084_20240905_203321.wav	5-Sep	20:33:21	111	43.018	107.17	40KMyo
BT-1	SMU08084_20240905_231409.wav	5-Sep	23:14:09	23	41.79	147.15	HighF
BT-1	SMU08084_20240906_222213.wav	6-Sep	22:22:13	55	36.9	54.81	MYOLUC
BT-1	SMU08084_20240915_213041.wav	15-Sep	21:30:41	24	39.878	62.15	MYOLUC
BT-1	SMU08084_20240920_225052.wav	20-Sep	22:50:52	54	41.782	92.84	40KMyo
BT-2	SMU01234_20240506_223917.wav	6-May	22:39:17	10	49.508	355.17	40KMyo
BT-2	SMU01234_20240506_220344.wav	6-May	22:03:44	12	46.206	344.85	40KMyo
BT-2	SMU01234_20240506_233734.wav	6-May	23:37:34	13	48.251	421.4	40KMyo
BT-2	SMU01892_20240528_221809.wav	28-May	22:18:09	11	44.057	212.96	40KMyo
BT-2	SMU01892_20240528_221801.wav	28-May	22:18:01	9	46.212	101.95	40KMyo
BT-2	SMU01892_20240528_221738.wav	28-May	22:17:38	103	43.011	172.52	40KMyo
BT-2	SMU01892_20240528_221830.wav	28-May	22:18:30	13	43.868	275.59	HighF
BT-2	SMU01892_20240530_220441.wav	30-May	22:04:41	22	45.97	264.29	HighF
BT-2	SMU01892_20240531_024042.wav	31-May	2:40:42	7	51.264	321.13	HighF
BT-2	SMU01892_20240531_012136.wav	31-May	1:21:36	18	50.204	181.6	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240602_232734.wav	2-Jun	23:27:34	19	45.299	183.31	40KMyo
BT-2	SMU01892_20240604_220955.wav	4-Jun	22:09:55	26	43.001	104.29	40KMyo
BT-2	SMU01892_20240608_014253.wav	8-Jun	1:42:53	25	47.754	225.13	40KMyo
BT-2	SMU01892_20240608_031617.wav	8-Jun	3:16:17	39	50.41	229.72	40KMyo
BT-2	SMU01892_20240608_221926.wav	8-Jun	22:19:26	30	46.288	213.98	40KMyo
BT-2	SMU01892_20240609_002809.wav	9-Jun	0:28:09	26	48.879	235.1	40KMyo
BT-2	SMU01892_20240609_000224.wav	9-Jun	0:02:24	28	44.461	195.31	HighF
BT-2	SMU01892_20240610_024728.wav	10-Jun	2:47:28	19	47.267	280.34	40KMyo
BT-2	SMU01892_20240610_004425.wav	10-Jun	0:44:25	31	44.799	276.72	40KMyo
BT-2	SMU01892_20240610_230700.wav	10-Jun	23:07:00	22	43.667	224.79	40KMyo
BT-2	SMU01892_20240610_031407.wav	10-Jun	3:14:07	29	55.582	316.54	HighF
BT-2	SMU01892_20240611_233916.wav	11-Jun	23:39:16	26	48.419	291.27	40KMyo
BT-2	SMU01892_20240611_033435.wav	11-Jun	3:34:35	17	43.849	229.81	HighF
BT-2	SMU01892_20240613_235739.wav	13-Jun	23:57:39	34	50.969	376.16	40KMyo
BT-2	SMU01892_20240614_001525.wav	14-Jun	0:15:25	19	61.42	337.23	HighF
BT-2	SMU01892_20240617_001110.wav	17-Jun	0:11:10	37	52.856	298.96	HighF
BT-2	SMU01892_20240618_030318.wav	18-Jun	3:03:18	20	42.398	85.18	40KMyo
BT-2	SMU01892_20240619_023724.wav	19-Jun	2:37:24	22	40.957	134.2	40KMyo
BT-2	SMU01892_20240619_023732.wav	19-Jun	2:37:32	10	39.981	82.93	40KMyo
BT-2	SMU01892_20240619_024221.wav	19-Jun	2:42:21	19	41.464	166.11	40KMyo
BT-2	SMU01892_20240619_230456.wav	19-Jun	23:04:56	21	58.408	429.21	40KMyo
BT-2	SMU01892_20240621_002558.wav	21-Jun	0:25:58	29	41.932	70.36	40KMyo
BT-2	SMU01892_20240621_034635.wav	21-Jun	3:46:35	31	40.008	86.19	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240621_231736.wav	21-Jun	23:17:36	13	48.117	263.93	40KMyo
BT-2	SMU01892_20240621_035034.wav	21-Jun	3:50:34	29	40.267	112.46	40KMyo
BT-2	SMU01892_20240621_231720.wav	21-Jun	23:17:20	23	45.838	218.76	40KMyo
BT-2	SMU01892_20240622_005524.wav	22-Jun	0:55:24	25	49.742	284.99	40KMyo
BT-2	SMU01892_20240622_011350.wav	22-Jun	1:13:50	17	45.333	240.3	40KMyo
BT-2	SMU01892_20240622_015340.wav	22-Jun	1:53:40	12	45.681	269.47	40KMyo
BT-2	SMU01892_20240622_005507.wav	22-Jun	0:55:07	48	42.863	116.67	40KMyo
BT-2	SMU01892_20240622_011031.wav	22-Jun	1:10:31	25	46.97	183.82	HighF
BT-2	SMU01892_20240622_030409.wav	22-Jun	3:04:09	10	48.702	176.93	HighF
BT-2	SMU01892_20240622_015105.wav	22-Jun	1:51:05	31	47.762	234.95	HighF
BT-2	SMU01892_20240622_031149.wav	22-Jun	3:11:49	13	48.533	111.64	HighF
BT-2	SMU01892_20240623_011211.wav	23-Jun	1:12:11	40	53.406	300.48	40KMyo
BT-2	SMU01892_20240623_020620.wav	23-Jun	2:06:20	31	52.605	300.52	40KMyo
BT-2	SMU01892_20240623_034225.wav	23-Jun	3:42:25	9	43.097	210.01	40KMyo
BT-2	SMU01892_20240623_034239.wav	23-Jun	3:42:39	23	40.56	177.92	40KMyo
BT-2	SMU01892_20240623_034314.wav	23-Jun	3:43:14	95	40.953	128.47	40KMyo
BT-2	SMU01892_20240623_034329.wav	23-Jun	3:43:29	19	40.78	141.82	40KMyo
BT-2	SMU01892_20240623_035523.wav	23-Jun	3:55:23	28	40.867	121.79	40KMyo
BT-2	SMU01892_20240623_014349.wav	23-Jun	1:43:49	23	47.797	186.1	HighF
BT-2	SMU01892_20240623_034424.wav	23-Jun	3:44:24	8	41.776	211.83	HighF
BT-2	SMU01892_20240624_002542.wav	24-Jun	0:25:42	31	41.482	83.34	40KMyo
BT-2	SMU01892_20240624_003823.wav	24-Jun	0:38:23	18	40.733	144.15	HighF
BT-2	SMU01892_20240625_005350.wav	25-Jun	0:53:50	26	51.584	278.25	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240625_011127.wav	25-Jun	1:11:27	37	43.024	128.92	40KMyo
BT-2	SMU01892_20240625_023500.wav	25-Jun	2:35:00	31	50.02	279.73	40KMyo
BT-2	SMU01892_20240625_005849.wav	25-Jun	0:58:49	12	41.538	84.85	HighF
BT-2	SMU01892_20240625_005404.wav	25-Jun	0:54:04	15	46.803	379.23	HighF
BT-2	SMU01892_20240625_020812.wav	25-Jun	2:08:12	22	42.042	78.14	HighF
BT-2	SMU01892_20240625_034640.wav	25-Jun	3:46:40	22	47.021	132.06	HighF
BT-2	SMU01892_20240626_005946.wav	26-Jun	0:59:46	16	40.589	124.76	40KMyo
BT-2	SMU01892_20240626_005802.wav	26-Jun	0:58:02	30	48.798	307.07	HighF
BT-2	SMU01892_20240628_022323.wav	28-Jun	2:23:23	15	47.927	208.63	40KMyo
BT-2	SMU01892_20240628_032304.wav	28-Jun	3:23:04	20	40.07	20.12	HighF
BT-2	SMU01892_20240629_013754.wav	29-Jun	1:37:54	23	46.354	199.3	40KMyo
BT-2	SMU01892_20240629_023804.wav	29-Jun	2:38:04	24	44.146	196.52	40KMyo
BT-2	SMU01892_20240629_031929.wav	29-Jun	3:19:29	36	48.907	272.58	40KMyo
BT-2	SMU01892_20240629_024302.wav	29-Jun	2:43:02	36	44.824	157.7	40KMyo
BT-2	SMU01892_20240630_012853.wav	30-Jun	1:28:53	34	56.622	367.7	40KMyo
BT-2	SMU01892_20240630_032014.wav	30-Jun	3:20:14	9	57.238	437.42	40KMyo
BT-2	SMU01892_20240630_232754.wav	30-Jun	23:27:54	23	39.741	115.33	40KMyo
BT-2	SMU01892_20240630_014855.wav	30-Jun	1:48:55	19	42.448	96.1	HighF
BT-2	SMU01892_20240702_232759.wav	2-Jul	23:27:59	48	43.434	114.56	40KMyo
BT-2	SMU01892_20240702_020441.wav	2-Jul	2:04:41	22	43.495	175.92	40KMyo
BT-2	SMU01892_20240702_040622.wav	2-Jul	4:06:22	26	41.462	139.23	40KMyo
BT-2	SMU01892_20240703_030722.wav	3-Jul	3:07:22	31	42.466	163.51	40KMyo
BT-2	SMU01892_20240703_030351.wav	3-Jul	3:03:51	27	46.309	334.2	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240705_000902.wav	5-Jul	0:09:02	21	39.371	86.04	40KMyo
BT-2	SMU01892_20240705_224540.wav	5-Jul	22:45:40	23	48.012	296.81	HighF
BT-2	SMU01892_20240706_014532.wav	6-Jul	1:45:32	56	37.981	70.54	40KMyo
BT-2	SMU01892_20240707_225940.wav	7-Jul	22:59:40	19	45.053	217.53	40KMyo
BT-2	SMU01892_20240708_223422.wav	8-Jul	22:34:22	18	38.203	122.25	40KMyo
BT-2	SMU01892_20240708_010901.wav	8-Jul	1:09:01	30	48.025	165.5	HighF
BT-2	SMU01892_20240708_225555.wav	8-Jul	22:55:55	26	39.042	56.44	HighF
BT-2	SMU01892_20240708_010838.wav	8-Jul	1:08:38	58	55.427	368.48	NoID
BT-2	SMU01892_20240709_002429.wav	9-Jul	0:24:29	40	39.901	76.87	HighF
BT-2	SMU01892_20240710_225635.wav	10-Jul	22:56:35	34	41.495	81.49	40KMyo
BT-2	SMU01892_20240710_002943.wav	10-Jul	0:29:43	23	38.501	49	40KMyo
BT-2	SMU01892_20240710_235222.wav	10-Jul	23:52:22	8	39.675	119.42	40KMyo
BT-2	SMU01892_20240711_034812.wav	11-Jul	3:48:12	32	42.369	107.62	40KMyo
BT-2	SMU01892_20240711_231037.wav	11-Jul	23:10:37	20	39.558	75.18	HighF
BT-2	SMU01892_20240712_231729.wav	12-Jul	23:17:29	40	40.036	62.89	40KMyo
BT-2	SMU01892_20240712_001219.wav	12-Jul	0:12:19	23	41.671	104.95	40KMyo
BT-2	SMU01892_20240712_234237.wav	12-Jul	23:42:37	32	38.972	58.34	HighF
BT-2	SMU01892_20240712_024408.wav	12-Jul	2:44:08	13	44.538	95.44	HighF
BT-2	SMU01892_20240714_011137.wav	14-Jul	1:11:37	39	39.457	112.29	40KMyo
BT-2	SMU01892_20240714_005602.wav	14-Jul	0:56:02	46	41.257	132.69	HighF
BT-2	SMU01892_20240714_005611.wav	14-Jul	0:56:11	91	41.051	141.24	HighF
BT-2	SMU01892_20240715_003731.wav	15-Jul	0:37:31	41	40.348	164.25	40KMyo
BT-2	SMU01892_20240715_003719.wav	15-Jul	0:37:19	26	39.411	159.23	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240715_003747.wav	15-Jul	0:37:47	12	39.236	167.3	40KMyo
BT-2	SMU01892_20240715_043112.wav	15-Jul	4:31:12	27	39.066	131.99	40KMyo
BT-2	SMU01892_20240715_030857.wav	15-Jul	3:08:57	13	41.075	168.46	NoID
BT-2	SMU01892_20240718_014659.wav	18-Jul	1:46:59	37	42.756	169.8	40KMyo
BT-2	SMU01892_20240718_014643.wav	18-Jul	1:46:43	22	45.823	205.98	40KMyo
BT-2	SMU01892_20240718_032610.wav	18-Jul	3:26:10	22	42.32	209.15	HighF
BT-2	SMU01892_20240719_022002.wav	19-Jul	2:20:02	15	40.557	80.38	40KMyo
BT-2	SMU01892_20240720_035415.wav	20-Jul	3:54:15	19	43.771	206.04	40KMyo
BT-2	SMU01892_20240720_034616.wav	20-Jul	3:46:16	8	39.69	155.92	HighF
BT-2	SMU01892_20240721_232220.wav	21-Jul	23:22:20	23	39.675	124.1	40KMyo
BT-2	SMU01892_20240722_025328.wav	22-Jul	2:53:28	62	49.992	284.37	40KMyo
BT-2	SMU01892_20240722_011805.wav	22-Jul	1:18:05	41	41.992	154.79	40KMyo
BT-2	SMU01892_20240722_031643.wav	22-Jul	3:16:43	13	46.977	256.3	40KMyo
BT-2	SMU01892_20240722_031538.wav	22-Jul	3:15:38	31	45.821	216.69	40KMyo
BT-2	SMU01892_20240723_024224.wav	23-Jul	2:42:24	40	40.695	73.35	40KMyo
BT-2	SMU01892_20240723_215612.wav	23-Jul	21:56:12	28	43.083	118.65	40KMyo
BT-2	SMU01892_20240724_014601.wav	24-Jul	1:46:01	36	41.08	66.11	40KMyo
BT-2	SMU01892_20240724_024424.wav	24-Jul	2:44:24	39	52.253	244.53	NoID
BT-2	SMU01892_20240724_022934.wav	24-Jul	2:29:34	33	47.745	215.76	NoID
BT-2	SMU01892_20240724_220255.wav	24-Jul	22:02:55	10	41.711	107.81	NoID
BT-2	SMU01892_20240725_031434.wav	25-Jul	3:14:34	18	42.899	138.84	40KMyo
BT-2	SMU01892_20240725_220458.wav	25-Jul	22:04:58	23	46.598	288.25	40KMyo
BT-2	SMU01892_20240725_023245.wav	25-Jul	2:32:45	25	39.368	68.81	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240727_221806.wav	27-Jul	22:18:06	27	43.138	163.11	40KMyo
BT-2	SMU01892_20240727_232208.wav	27-Jul	23:22:08	20	44.943	276.85	40KMyo
BT-2	SMU01892_20240727_235132.wav	27-Jul	23:51:32	32	40.274	125.69	40KMyo
BT-2	SMU01892_20240727_222827.wav	27-Jul	22:28:27	19	43.982	92.67	HighF
BT-2	SMU01892_20240728_001032.wav	28-Jul	0:10:32	18	42.415	120.19	40KMyo
BT-2	SMU01892_20240728_014253.wav	28-Jul	1:42:53	28	43.941	96.76	40KMyo
BT-2	SMU01892_20240728_004559.wav	28-Jul	0:45:59	16	42.721	253.6	40KMyo
BT-2	SMU01892_20240728_015253.wav	28-Jul	1:52:53	44	42.446	180.92	40KMyo
BT-2	SMU01892_20240728_033709.wav	28-Jul	3:37:09	42	54.214	411.73	40KMyo
BT-2	SMU01892_20240728_022419.wav	28-Jul	2:24:19	39	43.473	218.09	40KMyo
BT-2	SMU01892_20240728_044648.wav	28-Jul	4:46:48	37	44.825	172.73	40KMyo
BT-2	SMU01892_20240728_232711.wav	28-Jul	23:27:11	28	39.978	172.19	40KMyo
BT-2	SMU01892_20240728_232652.wav	28-Jul	23:26:52	32	38.981	72.19	HighF
BT-2	SMU01892_20240728_013826.wav	28-Jul	1:38:26	5	40.373	184.95	NoID
BT-2	SMU01892_20240729_033742.wav	29-Jul	3:37:42	15	39.244	178.19	40KMyo
BT-2	SMU01892_20240729_014257.wav	29-Jul	1:42:57	10	39.699	127	40KMyo
BT-2	SMU01892_20240730_041029.wav	30-Jul	4:10:29	14	45.806	235.24	40KMyo
BT-2	SMU01892_20240730_223137.wav	30-Jul	22:31:37	14	42.648	114.29	40KMyo
BT-2	SMU01892_20240730_225524.wav	30-Jul	22:55:24	24	39.294	113.6	40KMyo
BT-2	SMU01892_20240730_040728.wav	30-Jul	4:07:28	49	49.951	381.3	HighF
BT-2	SMU01892_20240730_040624.wav	30-Jul	4:06:24	14	48.347	339.83	HighF
BT-2	SMU01892_20240731_221357.wav	31-Jul	22:13:57	48	38.835	118.94	40KMyo
BT-2	SMU01892_20240731_225439.wav	31-Jul	22:54:39	39	42.468	81.15	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240731_235924.wav	31-Jul	23:59:24	17	44.095	135.8	40KMyo
BT-2	SMU01892_20240731_004850.wav	31-Jul	0:48:50	17	51.529	327.26	HighF
BT-2	SMU01892_20240801_021621.wav	1-Aug	2:16:21	26	40.242	71.31	40KMyo
BT-2	SMU01892_20240801_021210.wav	1-Aug	2:12:10	27	40.773	66.23	40KMyo
BT-2	SMU01892_20240801_004416.wav	1-Aug	0:44:16	18	41.761	46.88	40KMyo
BT-2	SMU01892_20240801_215225.wav	1-Aug	21:52:25	21	44.546	253.8	HighF
BT-2	SMU01892_20240802_214023.wav	2-Aug	21:40:23	31	42.571	121.41	HighF
BT-2	SMU01892_20240803_223715.wav	3-Aug	22:37:15	18	41.203	124.95	HighF
BT-2	SMU01892_20240804_000606.wav	4-Aug	0:06:06	43	42.89	94.14	40KMyo
BT-2	SMU01892_20240804_000620.wav	4-Aug	0:06:20	23	42.757	134.58	40KMyo
BT-2	SMU01892_20240804_011837.wav	4-Aug	1:18:37	25	45.576	96.66	HighF
BT-2	SMU01892_20240806_010505.wav	6-Aug	1:05:05	15	38.941	114.56	40KMyo
BT-2	SMU01892_20240806_033506.wav	6-Aug	3:35:06	52	54.874	341.08	HighF
BT-2	SMU01892_20240807_235430.wav	7-Aug	23:54:30	13	48.2	279.87	40KMyo
BT-2	SMU01892_20240808_013500.wav	8-Aug	1:35:00	12	40.8	115.84	40KMyo
BT-2	SMU01892_20240808_042718.wav	8-Aug	4:27:18	99	46.559	212.34	40KMyo
BT-2	SMU01892_20240808_053211.wav	8-Aug	5:32:11	5	15.841	123.57	HighF
BT-2	SMU01892_20240809_020340.wav	9-Aug	2:03:40	8	41.791	174.83	40KMyo
BT-2	SMU01892_20240809_020031.wav	9-Aug	2:00:31	15	40.595	174.45	40KMyo
BT-2	SMU01892_20240809_031837.wav	9-Aug	3:18:37	38	53.459	244.92	40KMyo
BT-2	SMU01892_20240809_222440.wav	9-Aug	22:24:40	15	40.076	114.95	40KMyo
BT-2	SMU01892_20240811_044108.wav	11-Aug	4:41:08	34	48.122	323.34	40KMyo
BT-2	SMU01892_20240811_231522.wav	11-Aug	23:15:22	13	39.532	155.23	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240811_234001.wav	11-Aug	23:40:01	45	50.732	208.52	40KMyo
BT-2	SMU01892_20240811_211645.wav	11-Aug	21:16:45	33	46.533	222.1	40KMyo
BT-2	SMU01892_20240811_021748.wav	11-Aug	2:17:48	24	47.923	201.98	HighF
BT-2	SMU01892_20240812_052609.wav	12-Aug	5:26:09	14	46.598	203.53	40KMyo
BT-2	SMU01892_20240812_052616.wav	12-Aug	5:26:16	21	48.26	382.97	40KMyo
BT-2	SMU01892_20240812_050257.wav	12-Aug	5:02:57	33	55.994	366.99	40KMyo
BT-2	SMU01892_20240812_033519.wav	12-Aug	3:35:19	13	40.674	12.66	NoID
BT-2	SMU01892_20240813_032418.wav	13-Aug	3:24:18	26	51.6	381.74	40KMyo
BT-2	SMU01892_20240813_042952.wav	13-Aug	4:29:52	48	50.516	296.3	40KMyo
BT-2	SMU01892_20240813_231045.wav	13-Aug	23:10:45	38	53.047	348.41	40KMyo
BT-2	SMU01892_20240814_045959.wav	14-Aug	4:59:59	10	42.278	239.25	HighF
BT-2	SMU01892_20240814_221254.wav	14-Aug	22:12:54	30	43.277	212.39	HighF
BT-2	SMU01892_20240815_210707.wav	15-Aug	21:07:07	29	45.519	254.43	40KMyo
BT-2	SMU01892_20240815_224925.wav	15-Aug	22:49:25	13	38.59	115.01	40KMyo
BT-2	SMU01892_20240815_030452.wav	15-Aug	3:04:52	25	52.129	227.49	HighF
BT-2	SMU01892_20240815_051453.wav	15-Aug	5:14:53	30	53.61	286.01	HighF
BT-2	SMU01892_20240815_224307.wav	15-Aug	22:43:07	22	53.182	406.72	HighF
BT-2	SMU01892_20240815_232306.wav	15-Aug	23:23:06	54	49.148	277.22	NoID
BT-2	SMU01892_20240816_225408.wav	16-Aug	22:54:08	38	49.464	461.21	40KMyo
BT-2	SMU01892_20240816_000203.wav	16-Aug	0:02:03	29	46.153	248.28	40KMyo
BT-2	SMU01892_20240816_000250.wav	16-Aug	0:02:50	31	47.839	176.11	40KMyo
BT-2	SMU01892_20240816_000451.wav	16-Aug	0:04:51	38	47.565	199.53	40KMyo
BT-2	SMU01892_20240816_211948.wav	16-Aug	21:19:48	26	42.001	156.83	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240816_001806.wav	16-Aug	0:18:06	65	50.582	198.54	HighF
BT-2	SMU01892_20240816_042423.wav	16-Aug	4:24:23	36	53.32	348.06	HighF
BT-2	SMU01892_20240816_235826.wav	16-Aug	23:58:26	40	46.788	227.06	HighF
BT-2	SMU01892_20240816_000131.wav	16-Aug	0:01:31	15	48.544	207.21	NoID
BT-2	SMU01892_20240816_042749.wav	16-Aug	4:27:49	32	41.886	119.7	NoID
BT-2	SMU01892_20240816_210821.wav	16-Aug	21:08:21	30	42.829	228.33	NoID
BT-2	SMU01892_20240817_211331.wav	17-Aug	21:13:31	29	45.833	330.5	40KMyo
BT-2	SMU01892_20240817_000848.wav	17-Aug	0:08:48	24	48.721	298.71	40KMyo
BT-2	SMU01892_20240817_004758.wav	17-Aug	0:47:58	34	46.354	235.79	40KMyo
BT-2	SMU01892_20240817_000155.wav	17-Aug	0:01:55	20	43.823	171.49	HighF
BT-2	SMU01892_20240817_015401.wav	17-Aug	1:54:01	40	54.38	325.63	HighF
BT-2	SMU01892_20240817_013258.wav	17-Aug	1:32:58	11	50.335	45.9	NoID
BT-2	SMU01892_20240818_051957.wav	18-Aug	5:19:57	16	46.407	137.74	40KMyo
BT-2	SMU01892_20240818_220233.wav	18-Aug	22:02:33	29	44.108	211.94	40KMyo
BT-2	SMU01892_20240818_225709.wav	18-Aug	22:57:09	26	45.218	241.54	40KMyo
BT-2	SMU01892_20240818_221425.wav	18-Aug	22:14:25	16	40.655	124.48	HighF
BT-2	SMU01892_20240819_054352.wav	19-Aug	5:43:52	14	45.514	270.27	40KMyo
BT-2	SMU01892_20240819_054333.wav	19-Aug	5:43:33	32	53.366	274.56	40KMyo
BT-2	SMU01892_20240819_054411.wav	19-Aug	5:44:11	17	44.477	239.18	40KMyo
BT-2	SMU01892_20240819_044624.wav	19-Aug	4:46:24	11	50.222	316.27	HighF
BT-2	SMU01892_20240819_054403.wav	19-Aug	5:44:03	16	44.841	291.05	NoID
BT-2	SMU01892_20240820_040737.wav	20-Aug	4:07:37	29	41.697	170.67	40KMyo
BT-2	SMU01892_20240823_042605.wav	23-Aug	4:26:05	31	49.036	321.44	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240823_042615.wav	23-Aug	4:26:15	33	50.071	359.24	40KMyo
BT-2	SMU01892_20240823_032545.wav	23-Aug	3:25:45	33	52.032	264.28	HighF
BT-2	SMU01892_20240823_013509.wav	23-Aug	1:35:09	44	51.44	301.15	HighF
BT-2	SMU01892_20240823_055319.wav	23-Aug	5:53:19	15	46.697	262.01	HighF
BT-2	SMU01892_20240823_215625.wav	23-Aug	21:56:25	26	44.398	238.79	NoID
BT-2	SMU01892_20240824_210728.wav	24-Aug	21:07:28	22	44.619	290.12	40KMyo
BT-2	SMU01892_20240824_222419.wav	24-Aug	22:24:19	18	49.293	263.79	HighF
BT-2	SMU01892_20240825_225329.wav	25-Aug	22:53:29	16	48.041	431.52	HighF
BT-2	SMU01892_20240826_205841.wav	26-Aug	20:58:41	29	43.994	260.92	40KMyo
BT-2	SMU01892_20240826_205835.wav	26-Aug	20:58:35	36	57.133	297.01	40KMyo
BT-2	SMU01892_20240826_013557.wav	26-Aug	1:35:57	17	44.477	135.26	40KMyo
BT-2	SMU01892_20240826_014020.wav	26-Aug	1:40:20	12	43.684	103.14	HighF
BT-2	SMU01892_20240826_054603.wav	26-Aug	5:46:03	17	47.878	375.51	HighF
BT-2	SMU01892_20240826_022517.wav	26-Aug	2:25:17	16	39.669	92.75	HighF
BT-2	SMU01892_20240826_054720.wav	26-Aug	5:47:20	12	36.593	126.42	HighF
BT-2	SMU01892_20240826_054710.wav	26-Aug	5:47:10	19	49.434	283.63	NoID
BT-2	SMU01892_20240826_214306.wav	26-Aug	21:43:06	19	44.097	237.54	NoID
BT-2	SMU01892_20240826_224736.wav	26-Aug	22:47:36	27	42.617	224.66	NoID
BT-2	SMU01892_20240828_011510.wav	28-Aug	1:15:10	10	50.015	479.51	40KMyo
BT-2	SMU01892_20240828_025448.wav	28-Aug	2:54:48	11	44.996	215.27	HighF
BT-2	SMU01892_20240829_004729.wav	29-Aug	0:47:29	7	39.69	266.29	HighF
BT-2	SMU01892_20240830_052549.wav	30-Aug	5:25:49	26	47.198	170.97	40KMyo
BT-2	SMU01892_20240830_224632.wav	30-Aug	22:46:32	12	45.385	262.06	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-2	SMU01892_20240830_224021.wav	30-Aug	22:40:21	65	45.393	241.26	40KMyo
BT-2	SMU01892_20240830_232422.wav	30-Aug	23:24:22	25	44.859	138.91	NoID
BT-2	SMU01892_20240831_023723.wav	31-Aug	2:37:23	31	45.534	244.29	40KMyo
BT-2	SMU01892_20240831_205754.wav	31-Aug	20:57:54	79	52.781	366.38	NoID
BT-2	SMU01892_20240831_205813.wav	31-Aug	20:58:13	35	44.412	194.09	NoID
BT-2	SMU01892_20240901_053606.wav	1-Sep	5:36:06	34	43.244	92.61	40KMyo
BT-2	SMU01892_20240901_203907.wav	1-Sep	20:39:07	23	44.207	246.37	40KMyo
BT-2	SMU01892_20240901_203856.wav	1-Sep	20:38:56	37	48.453	293.39	40KMyo
BT-2	SMU01892_20240901_210329.wav	1-Sep	21:03:29	30	42.938	190.78	40KMyo
BT-2	SMU01892_20240901_210652.wav	1-Sep	21:06:52	13	42.009	138.95	HighF
BT-2	SMU01892_20240902_010658.wav	2-Sep	1:06:58	31	49.828	356.89	40KMyo
BT-2	SMU01892_20240902_060658.wav	2-Sep	6:06:58	21	58.687	386.36	40KMyo
BT-2	SMU01892_20240902_230209.wav	2-Sep	23:02:09	51	42.469	154.61	40KMyo
BT-2	SMU01892_20240902_051515.wav	2-Sep	5:15:15	12	51.273	236.41	HighF
BT-2	SMU01892_20240903_042436.wav	3-Sep	4:24:36	26	43.534	220.45	40KMyo
BT-2	SMU01892_20240903_043015.wav	3-Sep	4:30:15	19	48.424	195.73	40KMyo
BT-2	SMU01892_20240905_224016.wav	5-Sep	22:40:16	54	45.599	213.57	40KMyo
BT-2	SMU01892_20240906_060746.wav	6-Sep	6:07:46	23	53.778	248.87	40KMyo
BT-2	SMU01892_20240908_043228.wav	8-Sep	4:32:28	29	42.695	137.15	HighF
BT-2	SMU01892_20240909_235122.wav	9-Sep	23:51:22	27	41.733	171.12	40KMyo
BT-2	SMU01892_20240910_230017.wav	10-Sep	23:00:17	38	44.134	204.2	HighF
BT-3	SMU03803_20240520_231529.wav	20-May	23:15:29	52	40.486	113.53	40KMyo
BT-3	SMU03803_20240521_042023.wav	21-May	4:20:23	40	37.208	42.09	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-3	SMU03803_20240522_225103.wav	22-May	22:51:03	20	40.22	67.85	MYOLUC
BT-3	SMU03803_20240527_224534.wav	27-May	22:45:34	50	43.137	159.24	40KMyo
BT-3	SMU03803_20240604_040752.wav	4-Jun	4:07:52	37	42.154	12.41	40KMyo
BT-3	SMU03803_20240608_000052.wav	8-Jun	0:00:52	28	37.816	98.68	40KMyo
BT-3	SMU03803_20240609_225334.wav	9-Jun	22:53:34	27	38.758	47.34	40KMyo
BT-3	SMU03803_20240610_003142.wav	10-Jun	0:31:42	48	42.88	133.02	40KMyo
BT-3	SMU03803_20240610_223631.wav	10-Jun	22:36:31	34	39.713	63.06	40KMyo
BT-3	SMU03803_20240611_023811.wav	11-Jun	2:38:11	37	40.106	87.05	40KMyo
BT-3	SMU03803_20240612_224420.wav	12-Jun	22:44:20	43	39.451	60.75	40KMyo
BT-3	SMU03803_20240612_235748.wav	12-Jun	23:57:48	45	39.117	103.12	40KMyo
BT-3	SMU03803_20240613_231454.wav	13-Jun	23:14:54	49	42.097	58.6	MYOLUC
BT-3	SMU03803_20240614_235359.wav	14-Jun	23:53:59	121	39.442	50.99	40KMyo
BT-3	SMU03803_20240614_030139.wav	14-Jun	3:01:39	19	39.218	30.44	HighF
BT-3	SMU03803_20240615_222147.wav	15-Jun	22:21:47	67	38.851	49.02	40KMyo
BT-3	SMU03803_20240615_002451.wav	15-Jun	0:24:51	62	41.568	62.72	40KMyo
BT-3	SMU03803_20240615_221804.wav	15-Jun	22:18:04	75	39.343	107.47	40KMyo
BT-3	SMU03803_20240615_032547.wav	15-Jun	3:25:47	31	39.494	51.26	HighF
BT-3	SMU03803_20240615_035512.wav	15-Jun	3:55:12	41	39.124	36.14	MYOLUC
BT-3	SMU03803_20240616_032331.wav	16-Jun	3:23:31	26	42.16	53.19	HighF
BT-3	SMU03803_20240617_034544.wav	17-Jun	3:45:44	39	38.068	38.06	40KMyo
BT-3	SMU03803_20240617_223611.wav	17-Jun	22:36:11	66	38.533	81.62	40KMyo
BT-3	SMU03803_20240617_032054.wav	17-Jun	3:20:54	19	40.311	71.51	40KMyo
BT-3	SMU03803_20240618_235503.wav	18-Jun	23:55:03	43	38.723	63.51	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-3	SMU03803_20240618_235605.wav	18-Jun	23:56:05	40	38.737	53.76	40KMyo
BT-3	SMU03803_20240618_235527.wav	18-Jun	23:55:27	97	40.311	93.35	MYOLUC
BT-3	SMU03803_20240618_235552.wav	18-Jun	23:55:52	42	38.565	54.36	MYOLUC
BT-3	SMU03803_20240619_225608.wav	19-Jun	22:56:08	97	38.473	64.5	MYOLUC
BT-3	SMU03803_20240620_004945.wav	20-Jun	0:49:45	64	38.526	160.1	40KMyo
BT-3	SMU03803_20240623_233438.wav	23-Jun	23:34:38	22	39.103	69.34	40KMyo
BT-3	SMU03803_20240625_031734.wav	25-Jun	3:17:34	55	39.668	150.19	40KMyo
BT-3	SMU03803_20240802_224230.wav	2-Aug	22:42:30	29	42.189	154.33	40KMyo
BT-3	SMU03803_20240803_234638.wav	3-Aug	23:46:38	36	42.785	125.44	40KMyo
BT-3	SMU03803_20240804_215701.wav	4-Aug	21:57:01	27	39.058	34.07	40KMyo
BT-3	SMU03803_20240804_215645.wav	4-Aug	21:56:45	27	38.919	41.84	40KMyo
BT-3	SMU03803_20240804_215626.wav	4-Aug	21:56:26	26	39.888	45.97	40KMyo
BT-3	SMU03803_20240804_225258.wav	4-Aug	22:52:58	44	41.549	83.74	MYOLUC
BT-3	SMU03803_20240805_020312.wav	5-Aug	2:03:12	57	37.565	31.1	40KMyo
BT-3	SMU03803_20240805_215235.wav	5-Aug	21:52:35	34	40.751	90.3	40KMyo
BT-3	SMU03803_20240805_005007.wav	5-Aug	0:50:07	18	42.094	90.99	40KMyo
BT-3	SMU03803_20240806_013649.wav	6-Aug	1:36:49	45	38.848	27.62	40KMyo
BT-3	SMU03803_20240807_004756.wav	7-Aug	0:47:56	59	36.04	50.77	40KMyo
BT-3	SMU03803_20240807_041315.wav	7-Aug	4:13:15	24	36.524	22.23	40KMyo
BT-3	SMU03803_20240809_001935.wav	9-Aug	0:19:35	22	42.969	106.66	40KMyo
BT-3	SMU03803_20240809_000513.wav	9-Aug	0:05:13	28	40.268	60.9	MYOLUC
BT-3	SMU03803_20240811_233947.wav	11-Aug	23:39:47	54	39.494	50.91	40KMyo
BT-3	SMU03803_20240812_214922.wav	12-Aug	21:49:22	48	32.506	22.35	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-3	SMU03803_20240816_012006.wav	16-Aug	1:20:06	19	37.459	38.29	40KMyo
BT-3	SMU03803_20240816_235938.wav	16-Aug	23:59:38	47	34.963	120.62	40KMyo
BT-3	SMU03803_20240816_232839.wav	16-Aug	23:28:39	37	35.061	28.47	HighF
BT-3	SMU03803_20240816_220609.wav	16-Aug	22:06:09	26	39.349	49.51	MYOLUC
BT-3	SMU03803_20240817_050255.wav	17-Aug	5:02:55	31	40.959	122.64	40KMyo
BT-3	SMU03803_20240817_032338.wav	17-Aug	3:23:38	16	43.381	58.35	40KMyo
BT-3	SMU03803_20240818_235056.wav	18-Aug	23:50:56	46	39.537	41.68	MYOLUC
BT-3	SMU03803_20240819_211859.wav	19-Aug	21:18:59	231	29.784	68.01	NoID
BT-3	SMU03803_20240822_211542.wav	22-Aug	21:15:42	71	38.939	75.42	40KMyo
BT-3	SMU03803_20240823_214823.wav	23-Aug	21:48:23	34	42.614	354.66	MYOSEP
BT-3	SMU03803_20240824_042039.wav	24-Aug	4:20:39	25	39.604	74.66	40KMyo
BT-3	SMU03803_20240825_214610.wav	25-Aug	21:46:10	56	35.543	58.97	40KMyo
BT-3	SMU03803_20240826_233212.wav	26-Aug	23:32:12	38	35.059	22.05	40KMyo
BT-3	SMU03803_20240827_220752.wav	27-Aug	22:07:52	134	30.934	26.61	NoID
BT-3	SMU03803_20240829_212816.wav	29-Aug	21:28:16	35	40.524	32.71	HighF
BT-3	SMU03803_20240902_040432.wav	2-Sep	4:04:32	36	38.756	128.74	40KMyo
BT-3	SMU03803_20240906_221830.wav	6-Sep	22:18:30	114	30.414	10.08	40KMyo
BT-3	SMU03803_20240913_213827.wav	13-Sep	21:38:27	19	35.274	63.29	40KMyo
BT-4	2MU03060_20240625_231313.wav	25-Jun	23:13:13	49	43.131	84.94	40KMyo
BT-4	2MU03060_20240625_230928.wav	25-Jun	23:09:28	20	41.382	14.88	HighF
BT-4	2MU03060_20240625_225435.wav	25-Jun	22:54:35	48	47.871	282.72	MYOSEP
BT-4	2MU03060_20240626_234417.wav	26-Jun	23:44:17	9	40.297	65.95	40KMyo
BT-4	2MU03060_20240701_230209.wav	1-Jul	23:02:09	51	37.235	40.39	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240701_232048.wav	1-Jul	23:20:48	26	39.239	35.91	40KMyo
BT-4	2MU03060_20240701_230729.wav	1-Jul	23:07:29	94	43.385	128.76	40KMyo
BT-4	2MU03060_20240703_231637.wav	3-Jul	23:16:37	53	40.658	88.48	40KMyo
BT-4	2MU03060_20240703_235913.wav	3-Jul	23:59:13	37	43.224	69.17	40KMyo
BT-4	2MU03060_20240703_005524.wav	3-Jul	0:55:24	27	44.146	164.45	40KMyo
BT-4	2MU03060_20240704_231317.wav	4-Jul	23:13:17	34	48.525	143.49	40KMyo
BT-4	2MU03060_20240704_004136.wav	4-Jul	0:41:36	26	44.98	104.03	40KMyo
BT-4	2MU03060_20240704_021505.wav	4-Jul	2:15:05	34	39.501	39.43	40KMyo
BT-4	2MU03060_20240704_002418.wav	4-Jul	0:24:18	28	43.046	183.58	40KMyo
BT-4	2MU03060_20240705_025516.wav	5-Jul	2:55:16	14	43.889	119.06	HighF
BT-4	2MU03060_20240706_232108.wav	6-Jul	23:21:08	33	44.254	132.45	40KMyo
BT-4	2MU03060_20240706_014148.wav	6-Jul	1:41:48	22	41.087	109.63	40KMyo
BT-4	2MU03060_20240706_011800.wav	6-Jul	1:18:00	23	43.108	142.5	40KMyo
BT-4	2MU03060_20240706_223705.wav	6-Jul	22:37:05	44	38.023	62.52	40KMyo
BT-4	2MU03060_20240708_024841.wav	8-Jul	2:48:41	32	41.93	74.91	40KMyo
BT-4	2MU03060_20240710_014646.wav	10-Jul	1:46:46	40	43.361	132.72	40KMyo
BT-4	2MU03060_20240710_224945.wav	10-Jul	22:49:45	28	41.538	133.56	40KMyo
BT-4	2MU03060_20240710_231337.wav	10-Jul	23:13:37	17	40.464	68.57	MYOLUC
BT-4	2MU03060_20240710_222730.wav	10-Jul	22:27:30	35	37.235	46.15	MYOLUC
BT-4	2MU03060_20240711_223529.wav	11-Jul	22:35:29	51	39.257	50.33	40KMyo
BT-4	2MU03060_20240711_230457.wav	11-Jul	23:04:57	67	43.102	85.78	MYOLUC
BT-4	2MU03060_20240711_222956.wav	11-Jul	22:29:56	31	40.695	42.18	MYOLUC
BT-4	2MU03060_20240712_034532.wav	12-Jul	3:45:32	49	39.349	100.47	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240712_022814.wav	12-Jul	2:28:14	31	41.852	57.39	HighF
BT-4	2MU03060_20240713_230216.wav	13-Jul	23:02:16	83	40.226	59.27	40KMyo
BT-4	2MU03060_20240713_230555.wav	13-Jul	23:05:55	49	40.984	68.41	40KMyo
BT-4	2MU03060_20240713_222637.wav	13-Jul	22:26:37	20	42.683	104.79	40KMyo
BT-4	2MU03060_20240713_225529.wav	13-Jul	22:55:29	21	39.974	58.62	MYOLUC
BT-4	2MU03060_20240714_225717.wav	14-Jul	22:57:17	30	42.773	105.04	40KMyo
BT-4	2MU03060_20240714_034840.wav	14-Jul	3:48:40	35	43.081	74.83	40KMyo
BT-4	2MU03060_20240715_225242.wav	15-Jul	22:52:42	29	42.528	51.84	40KMyo
BT-4	2MU03060_20240715_215714.wav	15-Jul	21:57:14	29	39.595	69.49	40KMyo
BT-4	2MU03060_20240715_022405.wav	15-Jul	2:24:05	16	43.486	127.54	40KMyo
BT-4	2MU03060_20240715_013014.wav	15-Jul	1:30:14	44	42.853	104.22	40KMyo
BT-4	2MU03060_20240715_013024.wav	15-Jul	1:30:24	95	42.384	80.12	40KMyo
BT-4	2MU03060_20240715_013139.wav	15-Jul	1:31:39	63	44.947	151.46	NoID
BT-4	2MU03060_20240716_014307.wav	16-Jul	1:43:07	28	45.779	227.77	40KMyo
BT-4	2MU03060_20240716_235345.wav	16-Jul	23:53:45	30	37.609	41.63	40KMyo
BT-4	2MU03060_20240716_025146.wav	16-Jul	2:51:46	27	57.837	441.97	HighF
BT-4	2MU03060_20240717_022244.wav	17-Jul	2:22:44	33	40.021	60.95	40KMyo
BT-4	2MU03060_20240720_223430.wav	20-Jul	22:34:30	70	38.348	50.72	40KMyo
BT-4	2MU03060_20240720_013710.wav	20-Jul	1:37:10	23	39.931	79.49	MYOLUC
BT-4	2MU03060_20240721_221016.wav	21-Jul	22:10:16	39	38.707	86.35	40KMyo
BT-4	2MU03060_20240723_225137.wav	23-Jul	22:51:37	25	41.495	71.38	40KMyo
BT-4	2MU03060_20240723_231906.wav	23-Jul	23:19:06	65	40.28	72.8	NoID
BT-4	2MU03060_20240724_233306.wav	24-Jul	23:33:06	52	40.442	75.07	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240724_015437.wav	24-Jul	1:54:37	18	40.536	42.6	40KMyo
BT-4	2MU03060_20240724_224132.wav	24-Jul	22:41:32	68	39.126	70.13	40KMyo
BT-4	2MU03060_20240725_234840.wav	25-Jul	23:48:40	44	36.993	38.42	40KMyo
BT-4	2MU03060_20240725_010535.wav	25-Jul	1:05:35	17	41.38	30.67	HighF
BT-4	2MU03060_20240726_002031.wav	26-Jul	0:20:31	52	42.264	110.46	40KMyo
BT-4	2MU03060_20240727_225249.wav	27-Jul	22:52:49	17	40.216	248.72	MYOSEP
BT-4	2MU03060_20240730_231652.wav	30-Jul	23:16:52	82	43.104	100.8	40KMyo
BT-4	2MU03060_20240731_015052.wav	31-Jul	1:50:52	28	43.744	122.53	HighF
BT-4	2MU03060_20240731_234746.wav	31-Jul	23:47:46	15	40.358	6.16	HighF
BT-4	2MU03060_20240731_225727.wav	31-Jul	22:57:27	26	48.056	147.9	NoID
BT-4	2MU03060_20240801_221120.wav	1-Aug	22:11:20	22	39.977	64.86	40KMyo
BT-4	2MU03060_20240801_001810.wav	1-Aug	0:18:10	24	37.655	166.92	40KMyo
BT-4	2MU03060_20240801_220758.wav	1-Aug	22:07:58	30	35.222	196.37	40KMyo
BT-4	2MU03060_20240801_014315.wav	1-Aug	1:43:15	30	42.228	50.77	HighF
BT-4	2MU03060_20240802_235326.wav	2-Aug	23:53:26	19	37.052	192.05	40KMyo
BT-4	2MU03060_20240803_013826.wav	3-Aug	1:38:26	12	42.152	215.67	40KMyo
BT-4	2MU03060_20240803_032852.wav	3-Aug	3:28:52	25	42.355	59.1	HighF
BT-4	2MU03060_20240803_221920.wav	3-Aug	22:19:20	32	37.02	125.59	HighF
BT-4	2MU03060_20240803_021823.wav	3-Aug	2:18:23	13	38.347	63.71	MYOLUC
BT-4	2MU03060_20240804_021317.wav	4-Aug	2:13:17	73	41.951	117.5	40KMyo
BT-4	2MU03060_20240804_021259.wav	4-Aug	2:12:59	56	39.065	213.13	40KMyo
BT-4	2MU03060_20240805_223928.wav	5-Aug	22:39:28	39	39.756	114.56	40KMyo
BT-4	2MU03060_20240806_010803.wav	6-Aug	1:08:03	14	41.104	57.03	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240806_040035.wav	6-Aug	4:00:35	25	41.713	74.3	HighF
BT-4	2MU03060_20240806_044357.wav	6-Aug	4:43:57	26	38.951	77.47	MYOLUC
BT-4	2MU03060_20240807_221342.wav	7-Aug	22:13:42	35	41.091	84.59	40KMyo
BT-4	2MU03060_20240807_030917.wav	7-Aug	3:09:17	36	43.421	163.06	40KMyo
BT-4	2MU03060_20240807_235356.wav	7-Aug	23:53:56	18	42.108	55.52	HighF
BT-4	2MU03060_20240807_231812.wav	7-Aug	23:18:12	13	38.499	177.27	NoID
BT-4	2MU03060_20240808_015250.wav	8-Aug	1:52:50	21	38.701	58.53	40KMyo
BT-4	2MU03060_20240808_222109.wav	8-Aug	22:21:09	16	43.244	43.7	40KMyo
BT-4	2MU03060_20240808_012028.wav	8-Aug	1:20:28	21	44.032	93.02	HighF
BT-4	2MU03060_20240808_022515.wav	8-Aug	2:25:15	34	42.957	90.94	HighF
BT-4	2MU03060_20240808_020338.wav	8-Aug	2:03:38	19	43.125	93.59	HighF
BT-4	2MU03060_20240809_011908.wav	9-Aug	1:19:08	32	40.008	92.2	40KMyo
BT-4	2MU03060_20240809_003130.wav	9-Aug	0:31:30	17	43.805	77.75	HighF
BT-4	2MU03060_20240809_013054.wav	9-Aug	1:30:54	33	41.956	28.19	HighF
BT-4	2MU03060_20240809_223719.wav	9-Aug	22:37:19	38	48.67	170.96	NoID
BT-4	2MU03060_20240809_011129.wav	9-Aug	1:11:29	11	37.302	216.34	NoID
BT-4	2MU03060_20240810_014125.wav	10-Aug	1:41:25	21	39.687	93.84	40KMyo
BT-4	2MU03060_20240810_231751.wav	10-Aug	23:17:51	31	56.321	372.07	40KMyo
BT-4	2MU03060_20240810_220525.wav	10-Aug	22:05:25	25	41.325	62.52	HighF
BT-4	2MU03060_20240810_214610.wav	10-Aug	21:46:10	25	40.459	62.31	HighF
BT-4	2MU03060_20240810_230504.wav	10-Aug	23:05:04	26	39.088	43.15	HighF
BT-4	2MU03060_20240810_011038.wav	10-Aug	1:10:38	14	39.725	58.32	MYOLUC
BT-4	2MU03060_20240810_011812.wav	10-Aug	1:18:12	18	43.868	101.52	MYOSEP

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240810_024055.wav	10-Aug	2:40:55	33	48.797	351.29	MYOSEP
BT-4	2MU03060_20240812_234138.wav	12-Aug	23:41:38	23	41.389	77.62	HighF
BT-4	2MU03060_20240812_225903.wav	12-Aug	22:59:03	25	40.166	54.56	HighF
BT-4	2MU03060_20240812_033811.wav	12-Aug	3:38:11	15	41.893	64.19	HighF
BT-4	2MU03060_20240813_001059.wav	13-Aug	0:10:59	23	37.98	48.77	40KMyo
BT-4	2MU03060_20240813_221818.wav	13-Aug	22:18:18	37	43.595	42.28	HighF
BT-4	2MU03060_20240813_041050.wav	13-Aug	4:10:50	29	42.119	47.64	HighF
BT-4	2MU03060_20240813_032811.wav	13-Aug	3:28:11	8	40.187	73.22	MYOLUC
BT-4	2MU03060_20240813_212812.wav	13-Aug	21:28:12	20	41.266	173.5	NoID
BT-4	2MU03060_20240814_223352.wav	14-Aug	22:33:52	39	40.996	116.6	40KMyo
BT-4	2MU03060_20240814_220938.wav	14-Aug	22:09:38	18	40.521	33.12	40KMyo
BT-4	2MU03060_20240814_020435.wav	14-Aug	2:04:35	40	42.031	70.17	HighF
BT-4	2MU03060_20240814_235536.wav	14-Aug	23:55:36	33	43.968	121.8	HighF
BT-4	2MU03060_20240815_222029.wav	15-Aug	22:20:29	41	42.761	80.1	40KMyo
BT-4	2MU03060_20240815_214802.wav	15-Aug	21:48:02	39	37.987	137.87	40KMyo
BT-4	2MU03060_20240815_020854.wav	15-Aug	2:08:54	30	39.691	60.43	40KMyo
BT-4	2MU03060_20240815_044104.wav	15-Aug	4:41:04	27	42.184	68.21	HighF
BT-4	2MU03060_20240815_041057.wav	15-Aug	4:10:57	26	43.898	90.29	HighF
BT-4	2MU03060_20240816_014746.wav	16-Aug	1:47:46	13	38.225	152.98	40KMyo
BT-4	2MU03060_20240816_024709.wav	16-Aug	2:47:09	23	45.046	214.47	MYOSEP
BT-4	2MU03060_20240817_025719.wav	17-Aug	2:57:19	28	43.465	110.12	40KMyo
BT-4	2MU03060_20240817_232559.wav	17-Aug	23:25:59	52	44.195	121.53	40KMyo
BT-4	2MU03060_20240817_033324.wav	17-Aug	3:33:24	18	41.775	32.66	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240818_212402.wav	18-Aug	21:24:02	100	43.925	95.66	40KMyo
BT-4	2MU03060_20240818_211430.wav	18-Aug	21:14:30	62	40.046	81.65	40KMyo
BT-4	2MU03060_20240818_014954.wav	18-Aug	1:49:54	24	39.384	167.02	40KMyo
BT-4	2MU03060_20240819_011715.wav	19-Aug	1:17:15	12	37.856	180.8	40KMyo
BT-4	2MU03060_20240819_005619.wav	19-Aug	0:56:19	29	44.995	52.67	MYOLUC
BT-4	2MU03060_20240819_224346.wav	19-Aug	22:43:46	22	37.952	236.88	NoID
BT-4	2MU03060_20240820_045106.wav	20-Aug	4:51:06	56	38.621	140.83	40KMyo
BT-4	2MU03060_20240821_223412.wav	21-Aug	22:34:12	76	42.148	62.08	HighF
BT-4	2MU03060_20240821_220250.wav	21-Aug	22:02:50	49	40.782	53.98	HighF
BT-4	2MU03060_20240822_234927.wav	22-Aug	23:49:27	45	42.191	67.41	HighF
BT-4	2MU03060_20240822_223459.wav	22-Aug	22:34:59	22	41.447	46.82	HighF
BT-4	2MU03060_20240822_032718.wav	22-Aug	3:27:18	26	41.252	87.03	HighF
BT-4	2MU03060_20240822_034942.wav	22-Aug	3:49:42	59	42.185	55.22	HighF
BT-4	2MU03060_20240823_032036.wav	23-Aug	3:20:36	15	38.891	122.27	40KMyo
BT-4	2MU03060_20240823_050333.wav	23-Aug	5:03:33	44	40.923	56.66	HighF
BT-4	2MU03060_20240823_024605.wav	23-Aug	2:46:05	21	45.506	337.49	NoID
BT-4	2MU03060_20240824_221631.wav	24-Aug	22:16:31	16	41.272	46.57	40KMyo
BT-4	2MU03060_20240824_004825.wav	24-Aug	0:48:25	15	38.948	163.41	40KMyo
BT-4	2MU03060_20240824_021437.wav	24-Aug	2:14:37	18	69.181	496.52	40KMyo
BT-4	2MU03060_20240824_002330.wav	24-Aug	0:23:30	36	40.19	124.09	40KMyo
BT-4	2MU03060_20240824_034453.wav	24-Aug	3:44:53	27	38.752	170.36	40KMyo
BT-4	2MU03060_20240824_234736.wav	24-Aug	23:47:36	37	54.261	399.17	40KMyo
BT-4	2MU03060_20240824_215119.wav	24-Aug	21:51:19	9	44.119	271.47	HighF

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240824_215142.wav	24-Aug	21:51:42	18	42.833	219.8	HighF
BT-4	2MU03060_20240824_022740.wav	24-Aug	2:27:40	37	39.681	56.95	MYOLUC
BT-4	2MU03060_20240824_230651.wav	24-Aug	23:06:51	17	41.029	295.32	MYOSEP
BT-4	2MU03060_20240824_215856.wav	24-Aug	21:58:56	12	42.265	257.84	NoID
BT-4	2MU03060_20240825_221916.wav	25-Aug	22:19:16	5	37.939	94.08	40KMyo
BT-4	2MU03060_20240825_215340.wav	25-Aug	21:53:40	29	65.806	411.68	HighF
BT-4	2MU03060_20240825_224051.wav	25-Aug	22:40:51	23	54.971	516.8	HighF
BT-4	2MU03060_20240825_211135.wav	25-Aug	21:11:35	54	38.522	49.45	MYOLUC
BT-4	2MU03060_20240825_214850.wav	25-Aug	21:48:50	15	44.801	337.11	NoID
BT-4	2MU03060_20240826_050349.wav	26-Aug	5:03:49	26	41.229	65.76	HighF
BT-4	2MU03060_20240827_001616.wav	27-Aug	0:16:16	14	37.328	29.94	40KMyo
BT-4	2MU03060_20240827_214120.wav	27-Aug	21:41:20	21	42.537	125.67	HighF
BT-4	2MU03060_20240827_212446.wav	27-Aug	21:24:46	16	42.468	251.67	NoID
BT-4	2MU03060_20240828_024038.wav	28-Aug	2:40:38	32	67.109	480.97	40KMyo
BT-4	2MU03060_20240828_002541.wav	28-Aug	0:25:41	18	42.497	84.11	HighF
BT-4	2MU03060_20240829_214333.wav	29-Aug	21:43:33	22	41.71	51.44	HighF
BT-4	2MU03060_20240829_215713.wav	29-Aug	21:57:13	25	42.323	49.71	HighF
BT-4	2MU03060_20240829_024909.wav	29-Aug	2:49:09	62	44.837	169.37	MYOSEP
BT-4	2MU03060_20240829_022223.wav	29-Aug	2:22:23	12	40.788	263.19	MYOSEP
BT-4	2MU03060_20240830_211800.wav	30-Aug	21:18:00	19	43.39	309.12	40KMyo
BT-4	2MU03060_20240831_034843.wav	31-Aug	3:48:43	26	41.255	52.15	HighF
BT-4	2MU03060_20240902_034646.wav	2-Sep	3:46:46	31	40.691	57.79	40KMyo
BT-4	2MU03060_20240903_220347.wav	3-Sep	22:03:47	27	44.375	355.55	40KMyo

Table C.2 Recorded Call Activity

Detector ID	File Name	Date (2024)	Time	# Pulses	Fc	Sc	Species (Manual ID)
BT-4	2MU03060_20240904_213632.wav	4-Sep	21:36:32	27	43.708	293.15	40KMyo
BT-4	2MU03060_20240904_220252.wav	4-Sep	22:02:52	15	37.112	198.74	40KMyo
BT-4	2MU03060_20240904_204518.wav	4-Sep	20:45:18	18	44.801	164.48	HighF
BT-4	2MU03060_20240904_213111.wav	4-Sep	21:31:11	15	43.651	354.61	MYOSEP
BT-4	2MU03060_20240904_213121.wav	4-Sep	21:31:21	20	43.931	318.56	MYOSEP
BT-4	2MU03060_20240906_220748.wav	6-Sep	22:07:48	33	39.988	43.52	40KMyo
BT-4	2MU03060_20240906_231847.wav	6-Sep	23:18:47	25	40.665	306.76	MYOSEP
BT-4	2MU03060_20240906_050415.wav	6-Sep	5:04:15	24	40.349	210.83	MYOSEP
BT-4	2MU03060_20240906_213045.wav	6-Sep	21:30:45	21	41.268	202.65	MYOSEP
BT-4	2MU03060_20240907_211650.wav	7-Sep	21:16:50	15	42.562	76.46	40KMyo
BT-4	2MU03060_20240907_230621.wav	7-Sep	23:06:21	15	40.275	315.69	40KMyo
BT-4	2MU03060_20240907_224614.wav	7-Sep	22:46:14	30	42.249	348.36	MYOSEP
BT-4	2MU03060_20240907_231333.wav	7-Sep	23:13:33	26	45.753	308.84	NoID
BT-4	2MU03060_20240908_232122.wav	8-Sep	23:21:22	29	42.08	210.86	40KMyo
BT-4	2MU03060_20240908_233656.wav	8-Sep	23:36:56	9	47.195	397.55	40KMyo
BT-4	2MU03060_20240908_015104.wav	8-Sep	1:51:04	26	50.568	353.57	HighF
BT-4	2MU03060_20240909_050411.wav	9-Sep	5:04:11	25	45.847	341.84	40KMyo
BT-4	2MU03060_20240910_220354.wav	10-Sep	22:03:54	15	40.402	151.87	40KMyo
BT-4	2MU03060_20240910_215525.wav	10-Sep	21:55:25	30	38.895	142.99	40KMyo
BT-4	2MU03060_20240910_221324.wav	10-Sep	22:13:24	44	38.47	125.05	40KMyo
BT-4	2MU03060_20240917_223632.wav	17-Sep	22:36:32	28	35.27	155.76	40KMyo

Appendix 6.G Land and Resource Use Survey Report

The Green Bay Ming Mine Project Land and Resource Use Survey Results

Final Report

January 6, 2025

Prepared for:
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Acronyms / Abbreviations

ATV	All-terrain vehicle
EA	Environmental Assessment
Firefly	FireFly Metals Canada Limited
km	Kilometers
LRU	Land and Resource Use
MW	Megawatts
NL	Newfoundland and Labrador
NL EPA	*Newfoundland Environmental Protection Act*
TMF	Tailings Management Facility
the Project	The Green Bay Ming Mine Project
UTV	Utility task vehicle
Q	Question
VC	Valued Component

1 Introduction

The Green Bay Ming Mine Project (the Project) is being proposed by FireFly Metals Canada Ltd (FireFly) on the Baie Verte peninsula in the province of Newfoundland and Labrador (NL), Canada. The Project is located approximately 7 kilometers (km) southwest of the Town of Ming's Bight and 10 km east of the Town of Baie Verte (Figure 1). The Project is an expansion of the underground copper-gold mine, known as the Ming Mine. The expansion and operation of the mine (i.e., the Project) will trigger provincial environmental assessment (EA) requirements under the *NL Environmental Protection Act* (NL EPA) and the submission of an EA Registration document.

This report provides the results of a Land and Resource Use (LRU) survey developed to engage the public and solicit feedback, identify LRU activities that occur in the proposed Project locations, and to identify public perceptions around the potential challenges and/or benefits of the Project. The results of the LRU survey will inform the development of the Project's EA Registration document.

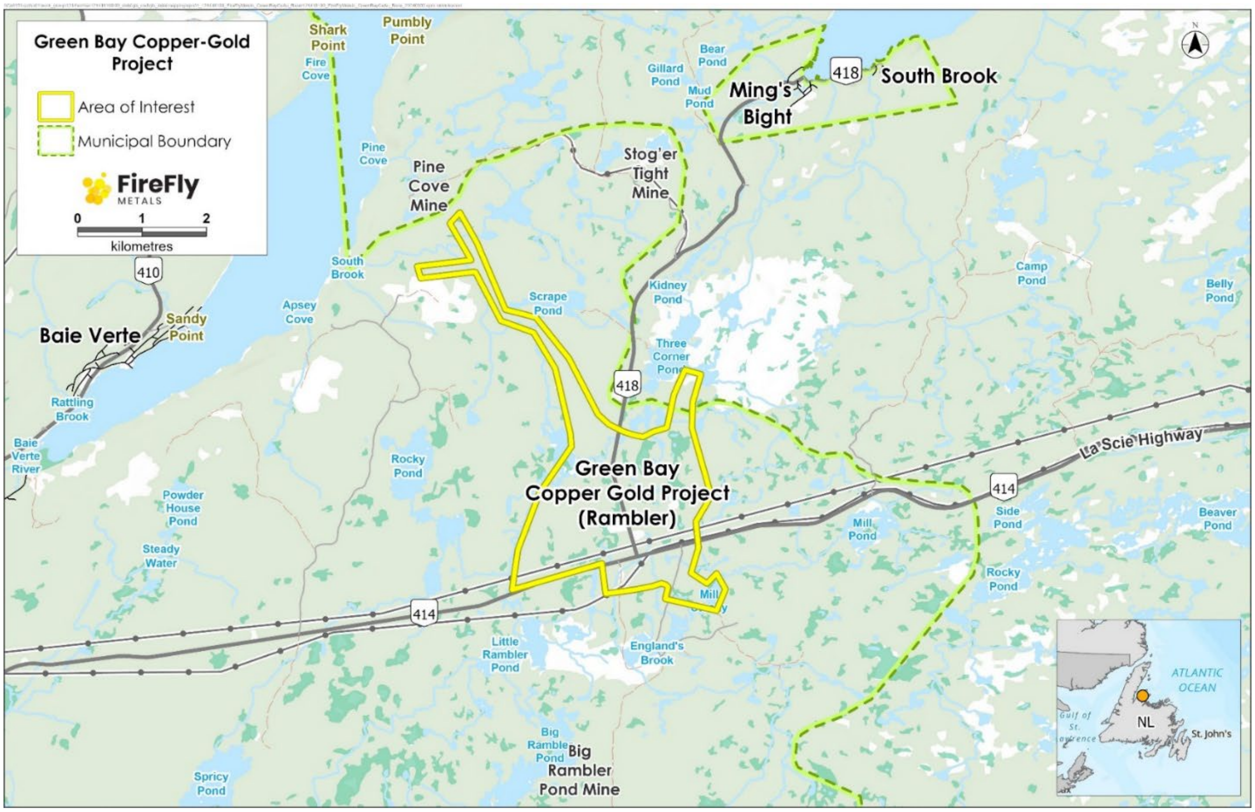


Figure 1 **Map of Proposed Project Area shared with the Public for the Land and Resource Use Survey**

2 Survey Methods

2.1 Overview

As described in Section 1.0, the LRU survey was developed to engage the public and solicit feedback, identify land and resource use activities that occur in the proposed Project locations, and to identify public perceptions around the potential challenges and/or benefits of the Project. The LRU survey was hosted online on the Surveymonkey platform at weblink: https://www.surveymonkey.com/r/GreenBayCopperGoldProject.

Firefly proactively promoted the LRU survey to encourage community participation and input. A QR code was generated by the Surveymonkey platform to increase accessibility, and Firefly printed information cards and other promotional materials (e.g., posters) that included the weblink and QR code for the LRU survey. Posters advertising the online LRU survey were set up at Firefly's work site, and at stores in Baie Verte and Ming's Bight that are frequented by the public. The online LRU survey link and QR code was posted to Firefly's social media sites (e.g., Facebook, LinkedIn, X [formerly Twitter]), shared with stakeholder groups and other engaged parties via email newsletters and was also promoted at numerous in-person events hosted by Firefly (e.g., NL Chamber of Commerce on October 9, 2024; regional and community group events in Baie Verte on October 9 and 10, 2024) (Photo 2-1).

The online LRU survey was open to the public from September 26 to October 25, 2024. The online LRU survey was composed of 42 questions, which included multiple choice, single choice, yes/no, and open-ended question formats.

A printed version of the LRU survey was also made available to the public. The printed version of the survey was made available for pick up at Firefly's regional and community group events in Baie Verte on October 9 and 10, 2024, with the option to return completed surveys to Firefly's information booth during the days of the events, or on or before October 11, 2024, at the FireFly Security Office located on Route #418, Ming's Bight Road, NL. The printed version of the survey had the same questions (and format) as those in the online survey.

Responses to the LRU survey were anonymous, and no contact information was sought from the participants.[1] The purpose of the LRU survey was stated in the introduction which required review before questions could be answered in the online version. The participants were able to close out of the online LRU survey at any time. Participants completing the printed version of the survey could skip questions if they preferred not to respond. A copy of the online LRU survey questions is provided in Appendix A. A copy of the printed version of the survey is provided in Appendix B. The results of the online and paper copies of the LRU survey were combined and analyzed as a single body of data. Appendix C provides examples of the materials distributed during the in-person events hosted by Firefly on October 9 and 10, 2024.

[1] Some participants included their contact information in the open-ended response option for Q42 – this information is considered confidential and is not included in this report.

Photo 2-1 **FireFly Information Booth at the Co-Op Grocery Store, Baie Verte, NL, on October 10, 2024**

2.2 Study Area

The Study Area for the LRU survey is provided in Figure 2. The Study Area included three areas: the Project's Area of Interest (yellow area; same as shown on Figure 1), and a 1 km buffer (orange area), and 5 km buffer (purple area) around the Project's Area of Interest.

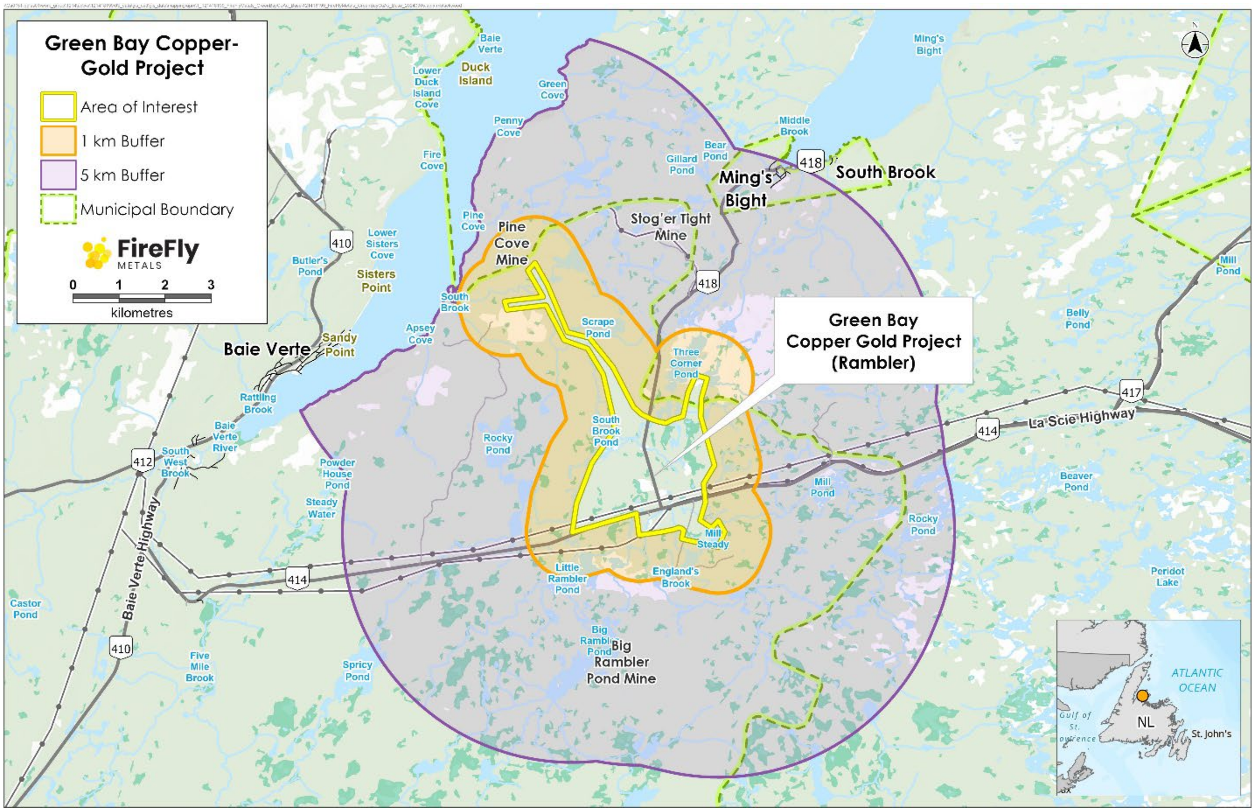


Figure 2 LRU Survey Study Area

2.3 Limitations

The LRU survey was not randomized, as the sample consisted of self-selected participants that had access to, and opted into, completing the survey online via the Surveymonkey platform, and/or opted to pick up, fill out, and mail and/or return the printed versions of the survey to FireFly.

Residents without computer literacy, and/or limited/no access to the internet and/or access to social media websites were not able to complete the online LRU survey. During the in-person events hosted by Firefly on October 9 and 10, 2024, FireFly staff provided a laptop to remove this technology barrier and offered to assist residents in completing the online survey at their information booths. A printed version of the survey was also made available during the regional and community group events in Baie Verte on October 9 and 10, 2024, with the option to return surveys on or before October 11, 2024, at Firefly's information booth or at the FireFly Security Office located on Route #418, Ming's Bight Road. Participants also had the option of mailing their completed surveys to the FireFly Security Office, as Firfely provided envelopes that had a return address and prepaid postage.

The online version of the LRU survey was not controlled for area of residence. While the participants were asked to self-identify their location of residence, they had the option of not disclosing this information. As a result, it is possible that some of the participants reside outside of the Project Area, and/or are not residents of the Island of Newfoundland.

The online version of the LRU survey permitted one response per IP address. For those families that have only one electronic device (e.g., desktop computer, tablet, cell phone, laptop computer), only one member of the family would have been able to participate in the survey as it would have been closed for subsequent entries upon registering the first completed survey associated with the IP address. Restrictions allowing only one survey per IP address were instated to reduce the potential for members of the public to skew the results collected by completing multiple surveys.

The printed version of the LRU survey was not controlled by IP address, however, as described below in survey results, only one paper copy was received. Data collected through the printed version of the LRU survey was considered and included in this report.

Responses provided to Question (Q) 42 "Participant Identification of Perceived Challenges or Benefits of the Project" by participants who self-identified as being a current employee of FireFly (in Q6) were excluded from the data presented in the results section for Q42 and Tables 1 and 2 in consideration of the potential for bias.

3 Survey Results

The LRU survey was completed by 418 participants, comprising 417 online surveys and one printed survey. As described in Section 3.1.4, the surveys potentially capture LRU information from approximately 870 to 1,270 residents, based on the reported number of people in each participant's household.

On average, the online survey took 7 minutes to complete. Completion times for the printed version is unknown; however, it is assumed to have taken approximately 10 minutes or less, consistent with the time required to complete the online survey.

The following sections provide figures and summaries of the information collected from the LRU survey for each of the questions (Q) asked. Open-ended responses provided for applicable questions are summarized in text. The results of Q1-Q8 are provided first (community questions), and the results of subsequent questions Q9-Q39 are organized by LRU activities, including recreational activities (Q10-Q11), big game hunting (Q12-Q16), small game hunting (Q17-Q21), freshwater fishing (Q22-Q26), plant gathering (Q27-Q31), domestic wood cutting (Q32-Q34), and water use (Q35-Q39). The report concludes with the results of the community views questions for Project engagement (Q40) and support (Q41), and a summary of responses is provided for Q42, which asked for participant identification of the perceived challenges and/or benefits of the Project.

3.1 Community Questions: Participant Self-identification

This section summarizes the results of Q1-Q8 which requested that the participant self-identify their group/identity affiliation, location of residence, gender identity, former or current employment with Rambler Metals and Mining or FireFly, and membership in one or more local user groups and/or organizations.

3.1.1 Q1 Participant Identity Self-Identification

The results of Q1 are presented in Figure 3. Of the 418 participants, 78.7% (n=329) identified as a non-Indigenous resident of northwestern Newfoundland, 1% (n=4) identified as a member of Qalipu First Nation, 0.2% (n=1) identified as a member of Miawpukek First Nation, and 9.1% (n=38) indicated that they preferred not to disclose, and 11% (n=46) identified as “other.” Of those who identified as “other,” 31 participants identified as residents of Newfoundland, 7 participants identified as residents of the Baie Verte Peninsula, and 5 participants identified as residents of Ontario. Additional responses provided for the “other” option included “Ming’s Bight” (n=3).

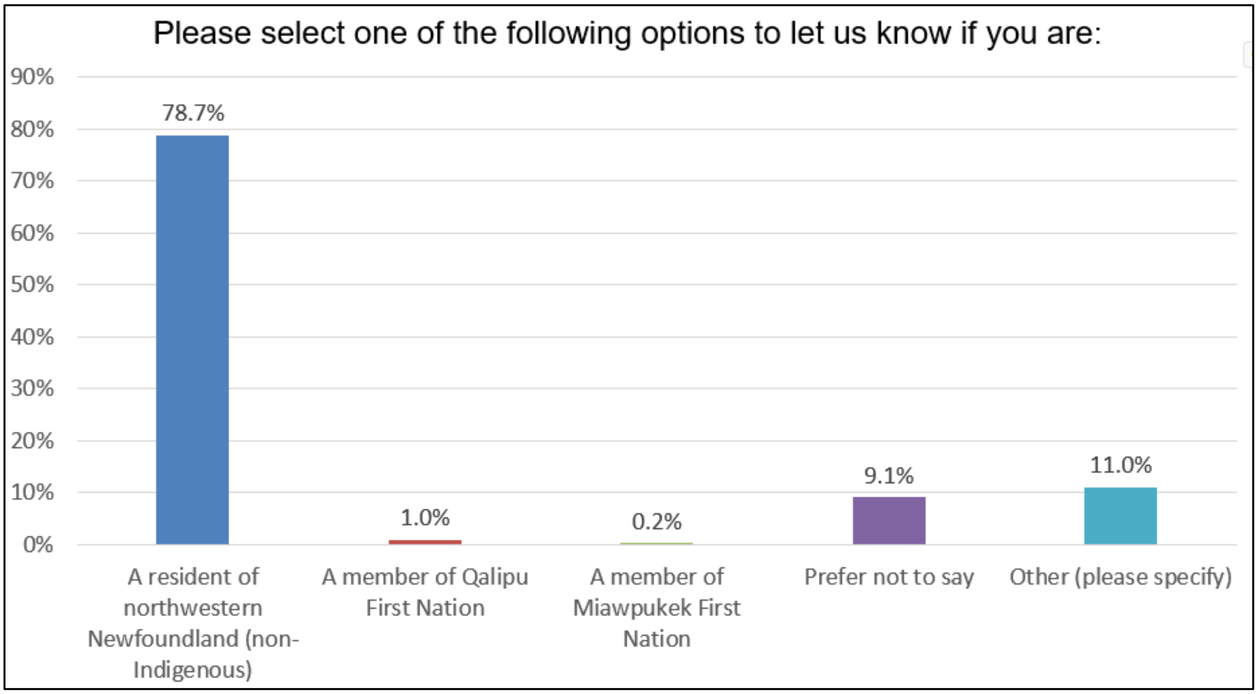


Figure 3 Participant Identity Self-identification Results

3.1.2 Q2 Participant Location of Residence

The results of Q2 are presented in Figure 4. Of the 418 participants, 406 disclosed their municipality or local service district. Of those 406 participants, 32% (n=130) reside in Baie Verte, 9.9% (n=40) reside in Ming's Bight, 8.1% (n=33) reside in LaScie, 6.4% (n=26) reside in Springdale, 6.2% (n=25) reside in Burlington, and 5.7% (n=23) reside in Woodstock.

Other listed locations identified by the participants as their area(s) of residence (numbering 10 or less for each area; between 2.5% and 0.3%) in order of frequency of mention include Fleur de Lys, Seal Cove, Pacquet, Nippers Harbour, Shoe Cove, Westport, Coachman's Cove, King's Point, Wild Cover, Deer Lake, Harbour Round, Round Harbour, Sheppardville, and Western Arm.

Approximately 13.6% (n=55) of the participants indicated that they resided in areas not listed for Q2. The most reported locations identified in the "other" category include Middle Arm (21.8%, n=12), Triton (9.1%, n=5), Smith's Harbour (9.1%, n=5), Gander (5.5%, n=3), and Corner Brook (5.5%, n=3).

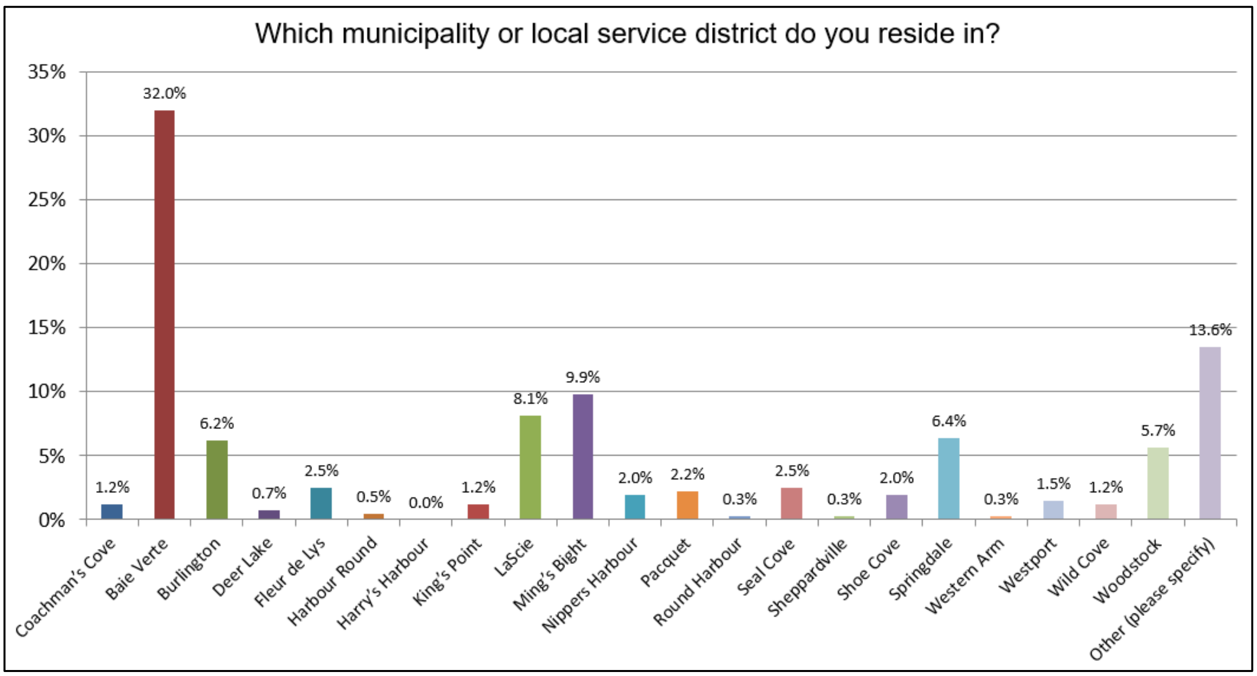


Figure 4 Participant location of residence

3.1.3 Q3 Participant Identification of Gender Identity

Results of Q3 are shown in Figure 5. Of the 418 participants, 400 disclosed their gender identity, while 18 skipped the question. Approximately 60% (n=204) identified as male, 47.8% (n=191) identified as female, 0.3% (n=1) identified as non-binary, and 1% (n=4) preferred not to disclose.

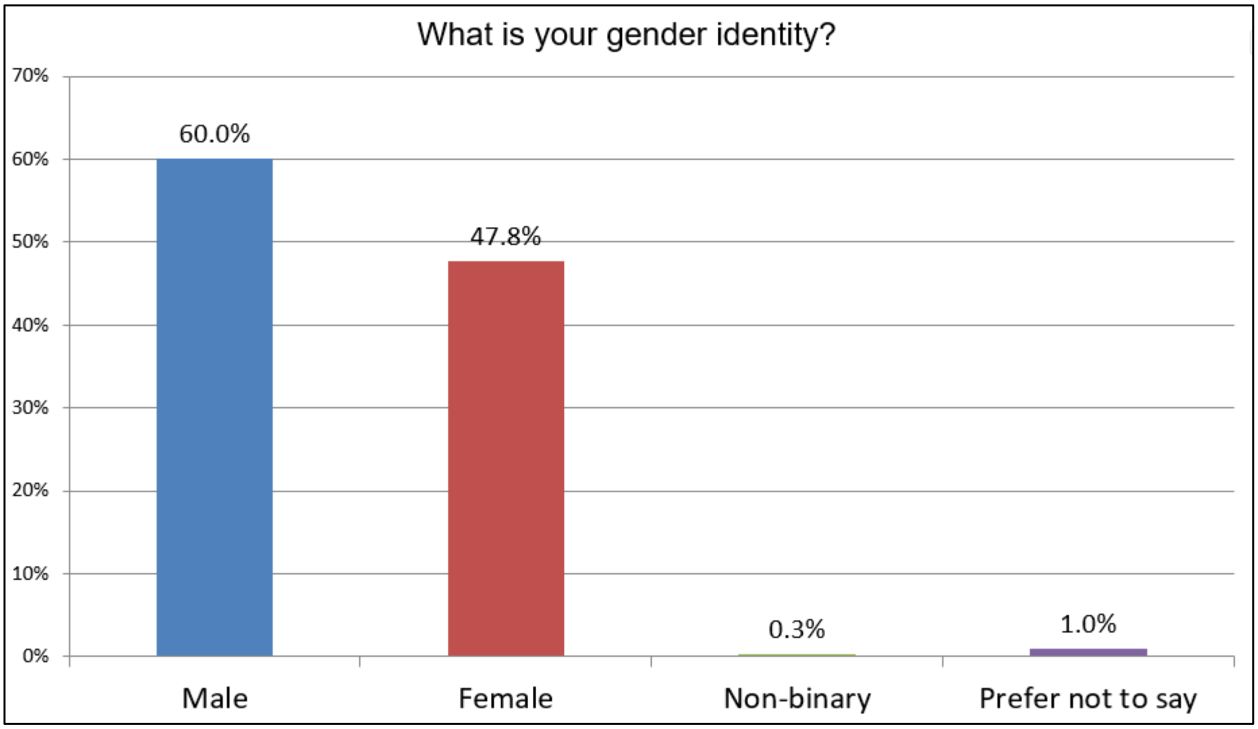


Figure 5 Participant identification of gender identity

3.1.4 Q4 Participant Identification of the Number of People Residing in their Household

Results of Q3 are shown in Figure 6. Of the 418 participants, 400 disclosed the number of people residing in their household. Approximately 48.8% (n=195) indicated there are between one to two people residing in their household, 42.5% (n=170) indicated there are between three to four people residing in their household, 7.5% (n=30) indicated there are between five to six people residing in their household, 0.8% (n=3) indicated there are seven or more people residing in their household, and 0.5% (n=2) preferred not to disclose. Based on these results, the survey had the potential to capture LRU information from approximately 870 to 1,270 residents.

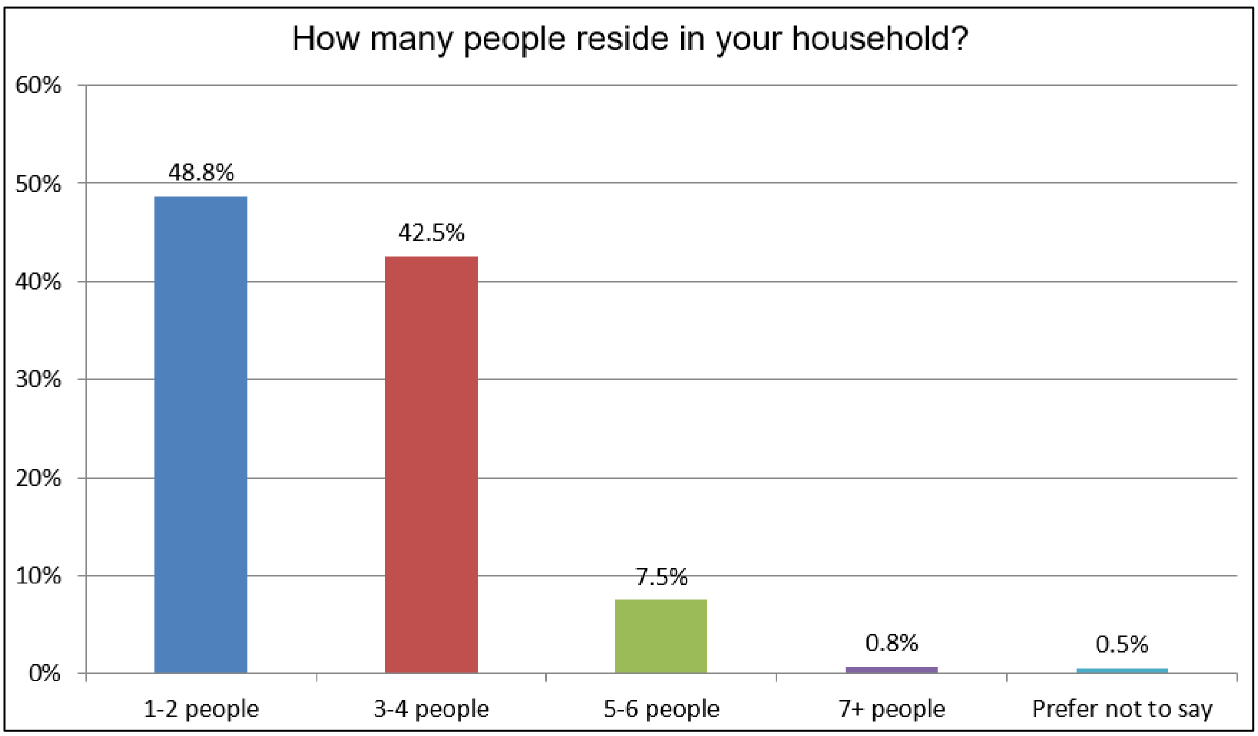


Figure 6 Participant identification of number of people residing in their household

3.1.5 Q5 Participant Identification of Former Employment with Rambler Metals and Mining

Results of Q5 are shown in Figure 7. Of the 418 participants, 400 disclosed whether they were a former employee of Rambler Metals and Mining. Approximately 27.5% (n=110) indicated that they were a former employee of Rambler Metals and Mining, while 72.5% (n=290) indicated they were not.

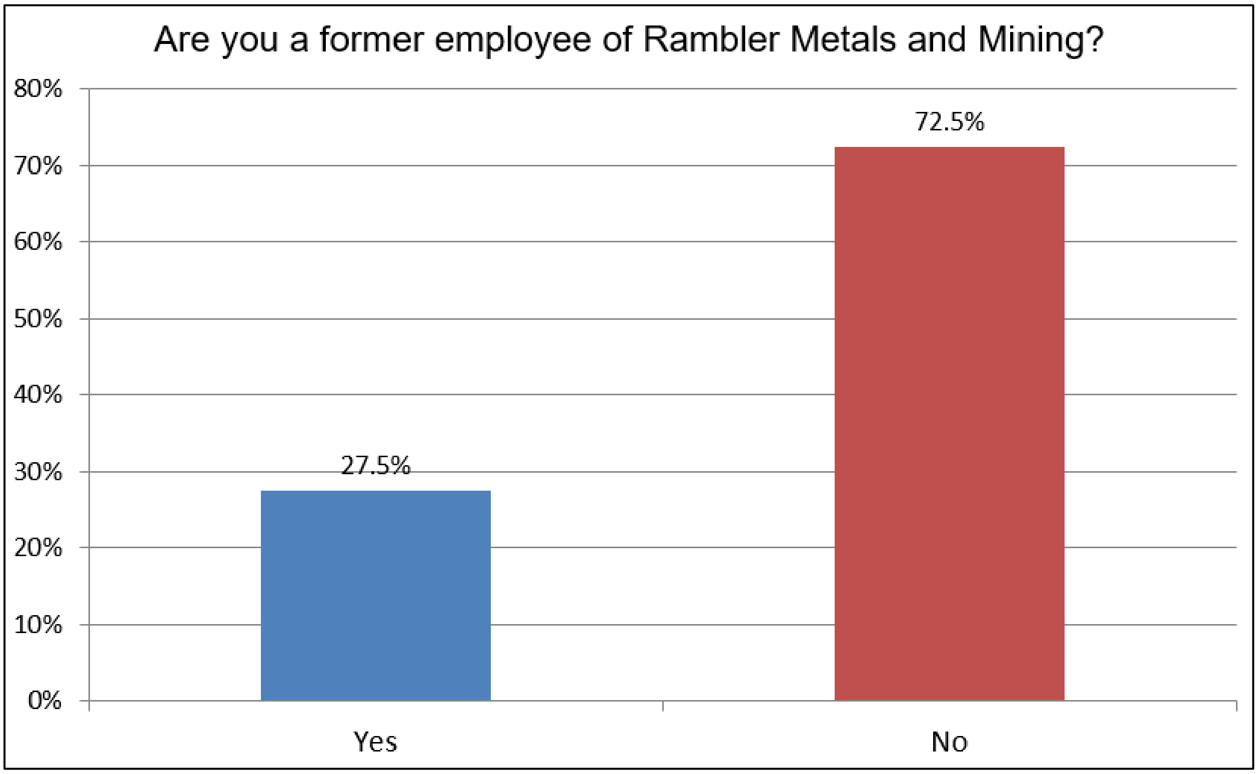


Figure 7 Participant identification of former employment with Rambler Metals and Mining

3.1.6 Q6 Participant Identification of Current Employment with FireFly

Results of Q6 are shown in Figure 8. Of the 418 participants, 400 disclosed whether they were a current employee of FireFly. Approximately 16% (n=64) indicated that they were a current employee of FireFly, while 84% (n=336) indicated they were not.

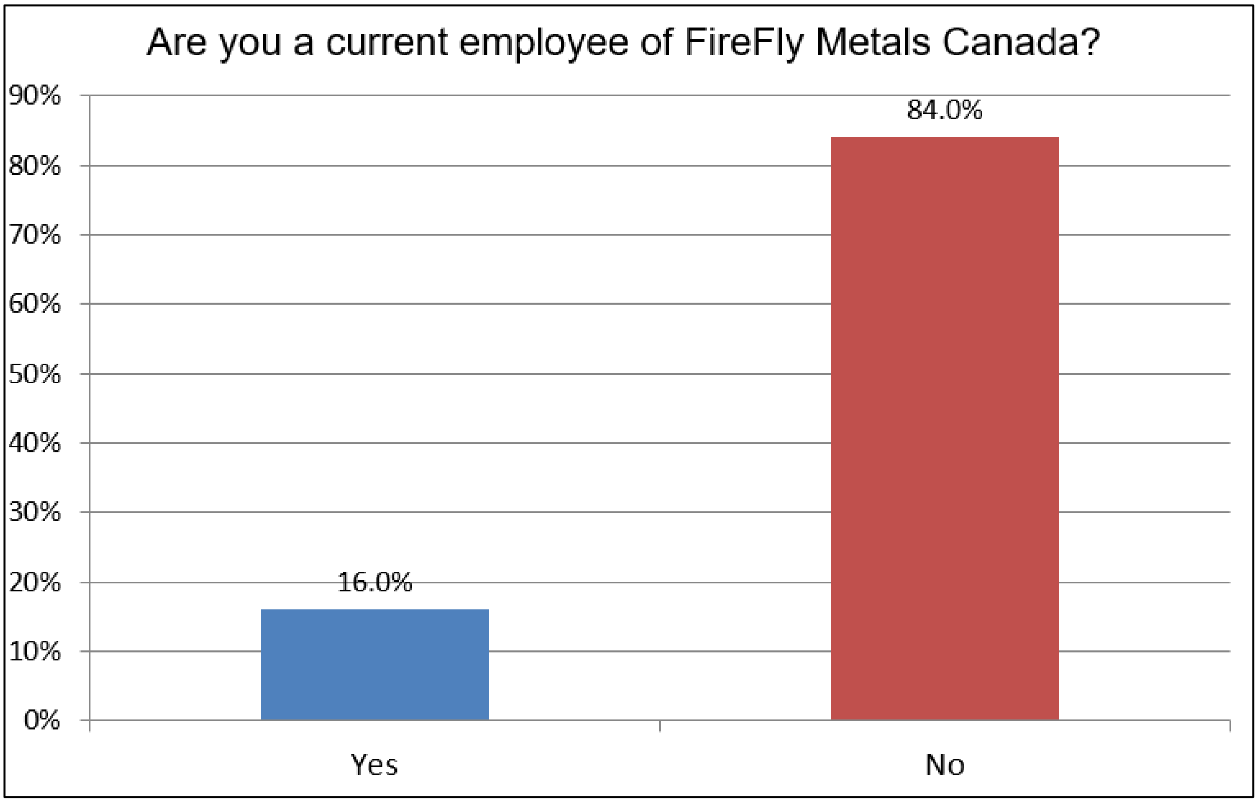


Figure 8 Participant identification of current employment with FireFly

3.1.7 Q7 Participant Identification of Membership with a Local Resource User Group, an Environmental Organization, or Other Organizations

Results of Q7 are shown in Figure 9. Of the 418 participants, 400 disclosed whether they were a member of a local resource user group (for example, the Atlantic Salmon Federation, NL Federation of Hunters and Anglers, NL Snowmobile Federation), an environmental organization (for example, CPAWS, Ducks Unlimited), or other organizations (for example, NL Outfitters Association, NL Aquaculture Industry Association). Approximately 15.8% (n=63) indicated they were a member of a local resource user group, an environmental organization, or another organization, while 84.2% (n=336) indicated they were not.

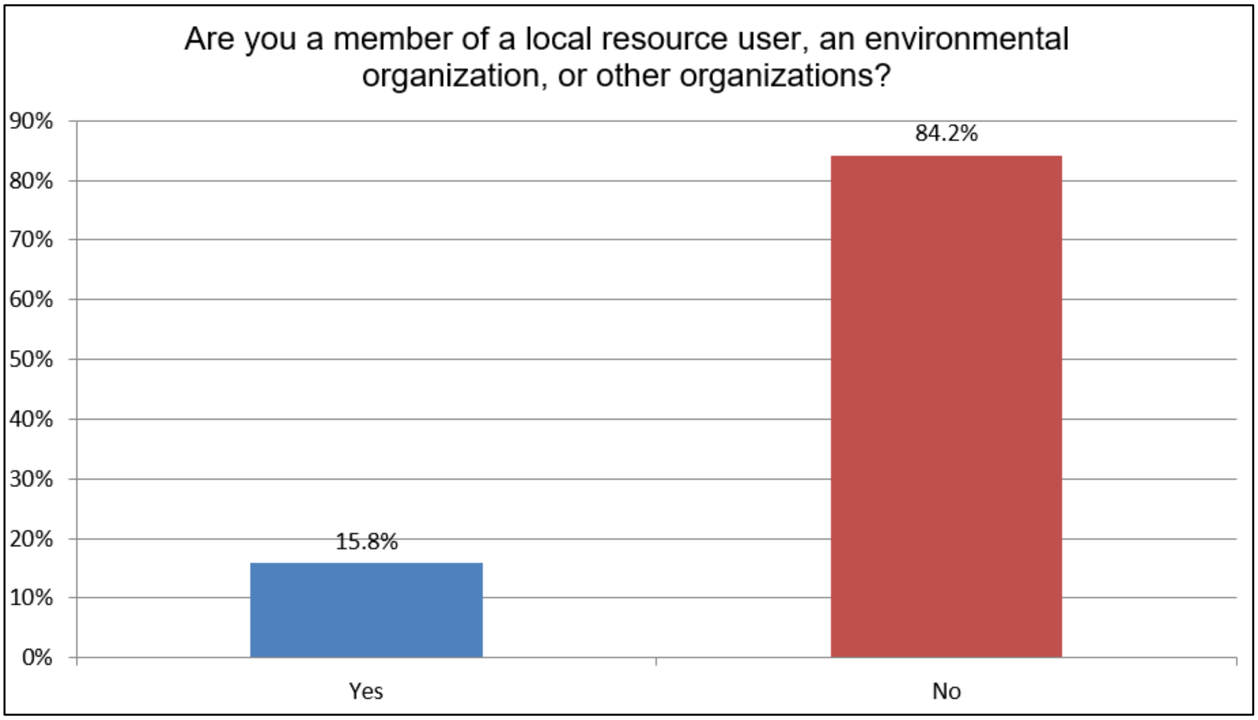


Figure 9 **Participant identification of membership with a local resource user group, an environmental organization or other organizations**

3.1.7.1 Q8 Participant identification of membership in Local Resource User Group(s), Environmental Organization(s), or Business Organization(s)

The results of Q8 are presented in Figure 10. Q8 allowed participants to identify one or more local resource user group(s), environmental organization(s), or business organization(s) that they are a member of. Of the 418 survey participants, 63 answered this question. Approximately 60.3% (n=38) preferred not to disclose their membership affiliations, while the remaining 39.7% (n=25) responded to the open-ended question. The most reported organization identified the Newfoundland Snowmobile Federation or an alternative snowmobile/ATV association (n=13). Other organizations identified include, but are not limited to, the Atlantic Salmon Federation, Baie Verte Peninsula Economic Development Association, Community Advisory Committee, Dorset Trail Tourism Association, Ducks Unlimited, Newfoundland Tourism, South and Central Health Foundation, Newfoundland Trailway, and unnamed hunting and fishing associations.

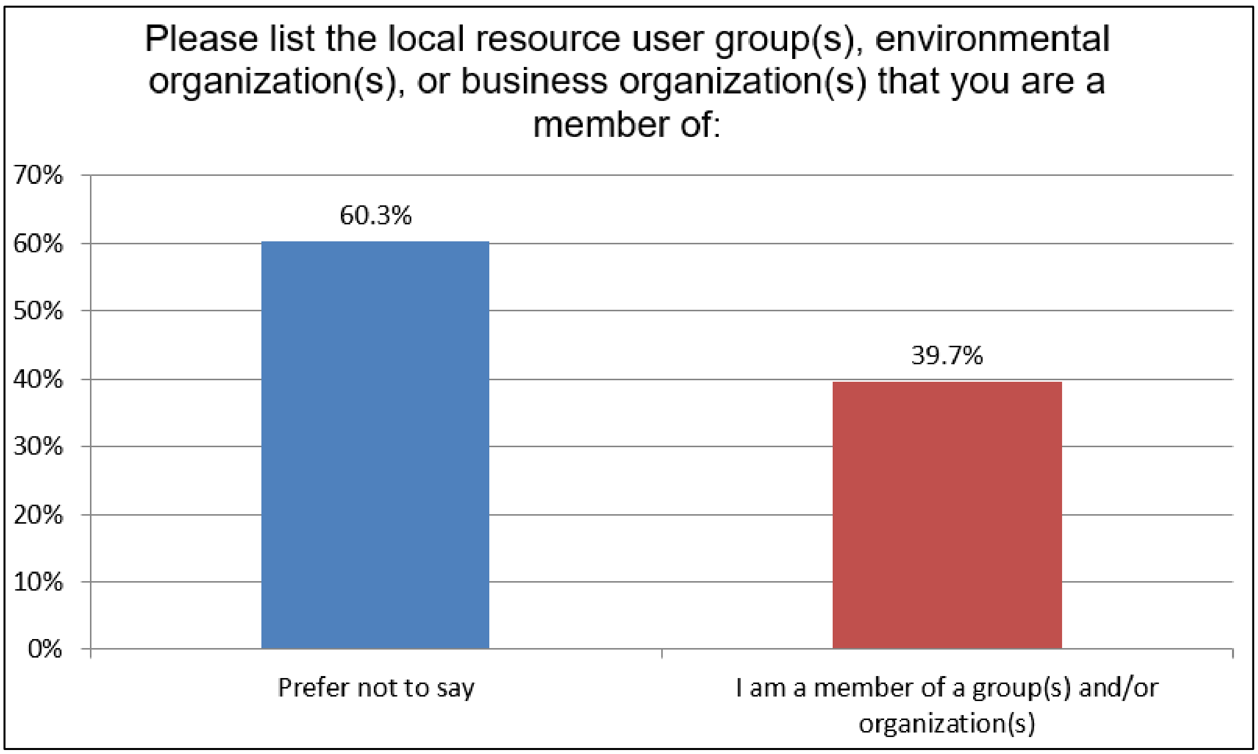


Figure 10 Participant identification of membership in local resource user group(s), environmental organization(s), or business organization(s)

3.2 LRU Activities

As described in section 2.2, the Study Area for the LRU survey included three areas: the Project's Area of Interest and a 1 km buffer and 5 km buffer around the Project's Area of Interest (Figure 2). This section provides the results of the questions regarding the participant's LRU activities in the Study Area.

The results of questions Q9-Q39 are organized by LRU activities, including recreational activities (Q10-Q11), big game hunting (Q12-Q16), small game hunting (Q17-Q21), freshwater fishing (Q22-Q26), plant gathering (Q27-Q31), domestic wood cutting (Q32-Q34), and water use (Q35-Q39). Q9, described below in Section 3.2.1, triggered the survey logic that allowed for participants to skip ahead to the community views questions (Q40-Q42) if they responded "no," indicating that they, or a member of their family, did not engage in any of the identified LRU activities within the Study Area.

3.2.1 Q9 LRU within the Study Area

The results of Q9 are presented in Figure 11. Q9 asked participants if they engaged in LRU activities within the Study Area, as shown on Figure 2. Of the 418 participants, 396 provided a response to Q9. Approximately 54.90% (n=217) of the participants confirmed that they engage in LRU activities within the Study Area, while 45.2% (n=179) of the participants stated they do not engage in LRU activities in the Study Area.

These activities include one or more of the following:

- Recreational activities, such as hiking, snowshoeing, snowmobiling, swimming, canoeing, bird watching, camping, cycling, all-terrain vehicle (ATV)/Utility Task Vehicle (UTV) use, or dirt biking
- Hunting big game (like moose) or trapping or hunting small game (like rabbits or partridge) for food, recreation, sport, commercial, or traditional/cultural purposes
- Fishing for food, recreation, sport, commercial or traditional/cultural purposes
- Picking berries (such as blueberries, wild strawberries or partridgeberries) or harvesting other plants (such as mushrooms, bark, or Labrador tea)
- Cutting wood for domestic purposes such as heating your home, firewood, and traditional/cultural or artisanal purposes
- Water use for bathing, cooking, cleaning or for drinking water

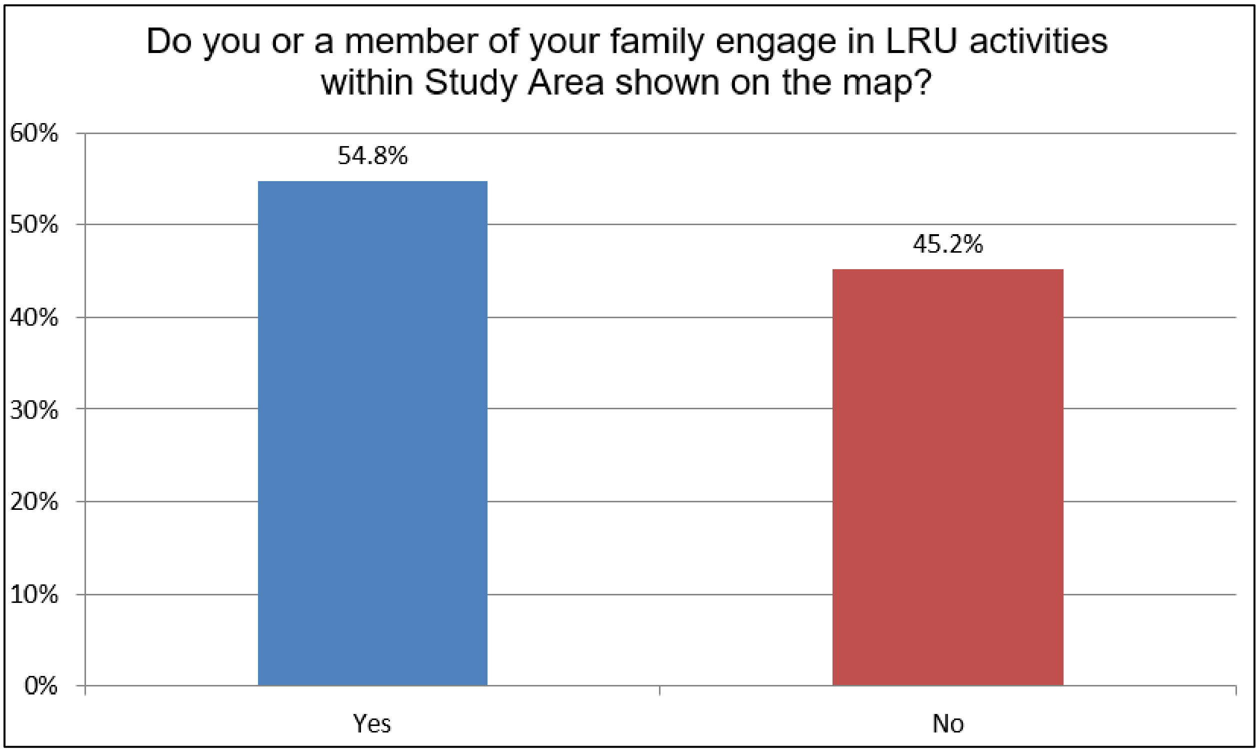


Figure 11 **LRU within the Study Area**

3.2.1.1 Q10 Recreational Activity Locations

Q10 allowed participants to identify whether they engaged in recreational activities within the Study Area, as shown on Figure 2. Examples of recreational activities provided included hiking, snowshoeing, fishing, boating, ATV or dirt biking, snowmobiling, swimming, and canoeing.

The results of Q10 are presented in Figure 12. Of the 418 participants, 217 answered the question. Approximately 40.6% (n=89) indicated that they engage in recreational activities within all parts of the Study Area, as shown on Figure 2. In addition, 3.7% (n=8) indicated that they engage in recreational activities in the Project's Area of Interest; 5.0% (n=11) engage in recreational activities within a 1 km buffer of the Project's Area of Interest, 33.8% (n=74) engage in recreational activities within a 5 km buffer of the Project's Area of Interest, and 22.3% (n=51) indicated that they do not engage in recreational activities within the Study Area.

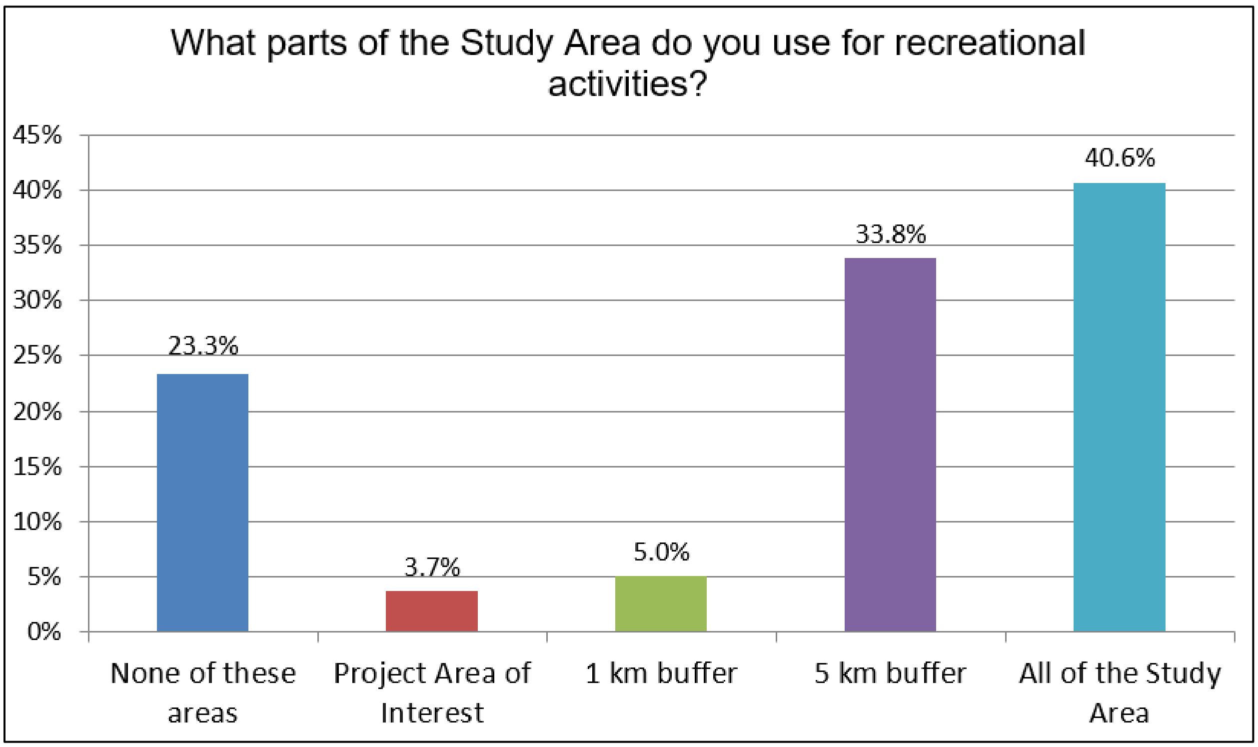


Figure 12 Recreational Activities within the Study Area

3.2.1.2 Q11 Types of Recreational Activities

The results of Q11 are presented in Figure 13. Of the 418 participants, 166 identified one or more recreational activities they engage in within the Study Area (Figure 2). Snowmobiling was identified as the most common recreational activity by 88.6% (n=147) of respondents, while ATV or other touring (e.g., UTV, Side-by-side) was identified as the second most common recreational activity by 75.9% (n=126) of respondents. Other recreational activities identified by participants include bird watching (5.4%, n=9), boating (19.3%, n=32), camping (17.5%, n=29), canoeing and/or kayaking (18.7%, n=31), cross-country skiing (1.2%, n=2), cycling (2.4%, n=4), hiking/walking (30.7%, n=51), running/jogging (1.2%, n=2), skating (4.8%, n=8), snowshoeing (22.9%, n=38), and swimming (8.4%, n=14).

In addition, approximately 7.2% (n=12) participants specified “other” recreational activities they engage in, including hunting (n=5), fishing (n=3), berry picking (n=2), Christmas tree cutting (n=1), and wood cutting (n=1).

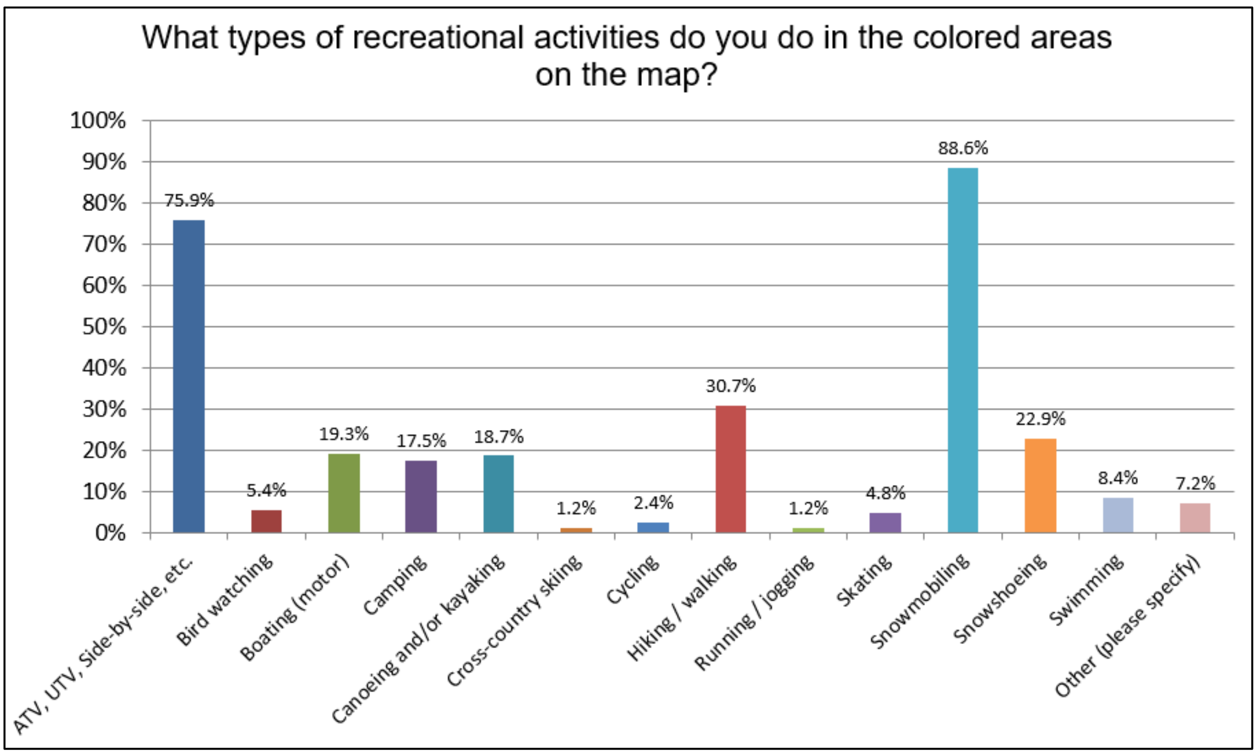


Figure 13 Recreational Activities within the Study Area

3.2.2 Q12 Big Game Hunting

The results of Q12 are presented in Figure 14. Of the 418 participants, 211 provided a response on whether they or a family member hunts big game, such as moose or bear, within the Study Area, as shown on Figure 2. Approximately 29.7% (n=63) of participants identified that they or a family member engage in big game hunting within all parts of the Study Area. In addition, 1.9% (n=4) of participants identified that they engage in big game hunting within the Project's Area of Interest, 3.3% (n=7) within a 1 km buffer of the Project's Area of Interest, and 31.8% (n=67) within a 5 km buffer of the Project's Area of Interest. Approximately 36 % (n=76) indicated they did not engage in big game hunting within the Study Area.

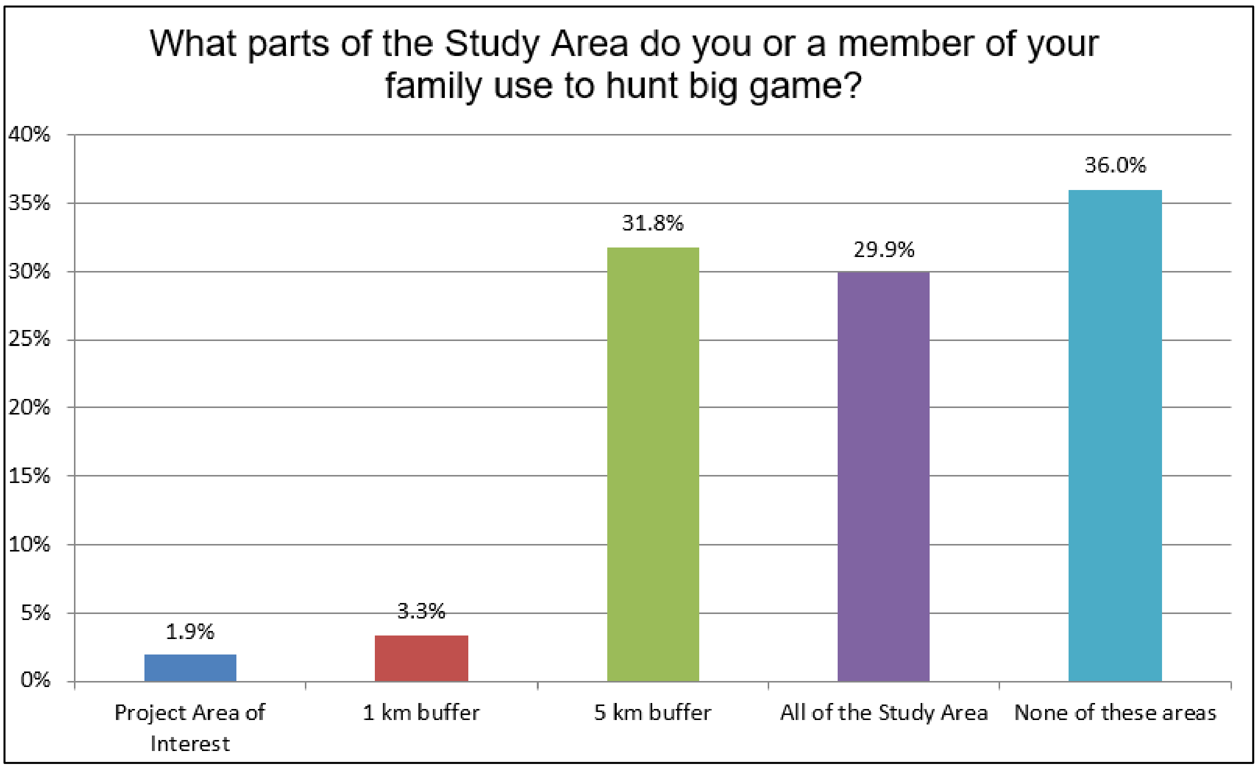


Figure 14 Big game hunting within the Study Area

3.2.2.1 Q13 Purpose of Big Game Hunting

The results of Q13 are presented in Figure 15. Q13 allowed participants to identify one or more of the purposes for their harvest of big game from the Study Area, as shown on Figure 2. Of the 418 participants, 131 provided a response. Food was identified as the most common purpose for hunting big game (95.4%, n=125). Recreation and/or sport was identified as the second most common purpose for hunting big game (37.4%, n=49), followed by traditional and/or cultural purposes (6.9%, n=9), and commercial use (2.3%, n=3). No other purposes were identified by participants.

Figure 15 Purpose of big game hunting within the Study Area

3.2.2.2 Q14 Species of Big Game Hunted

The results of Q14 are presented in Figure 16. Q14 allowed participants to identify one or more species of big game that they, or a member of their family, hunt within the Study Area, as shown on Figure 2. Of the 418 participants, 131 identified harvested species. Moose was identified as the most harvested species of big game (100%, n=131), followed by bear (24.4%, n=32). Approximately 1.5% (n=2) of the participants indicated that they hunt “other” species of big game not listed, including grouse and rabbit, which were included in a subsequent question for small game (Q19).

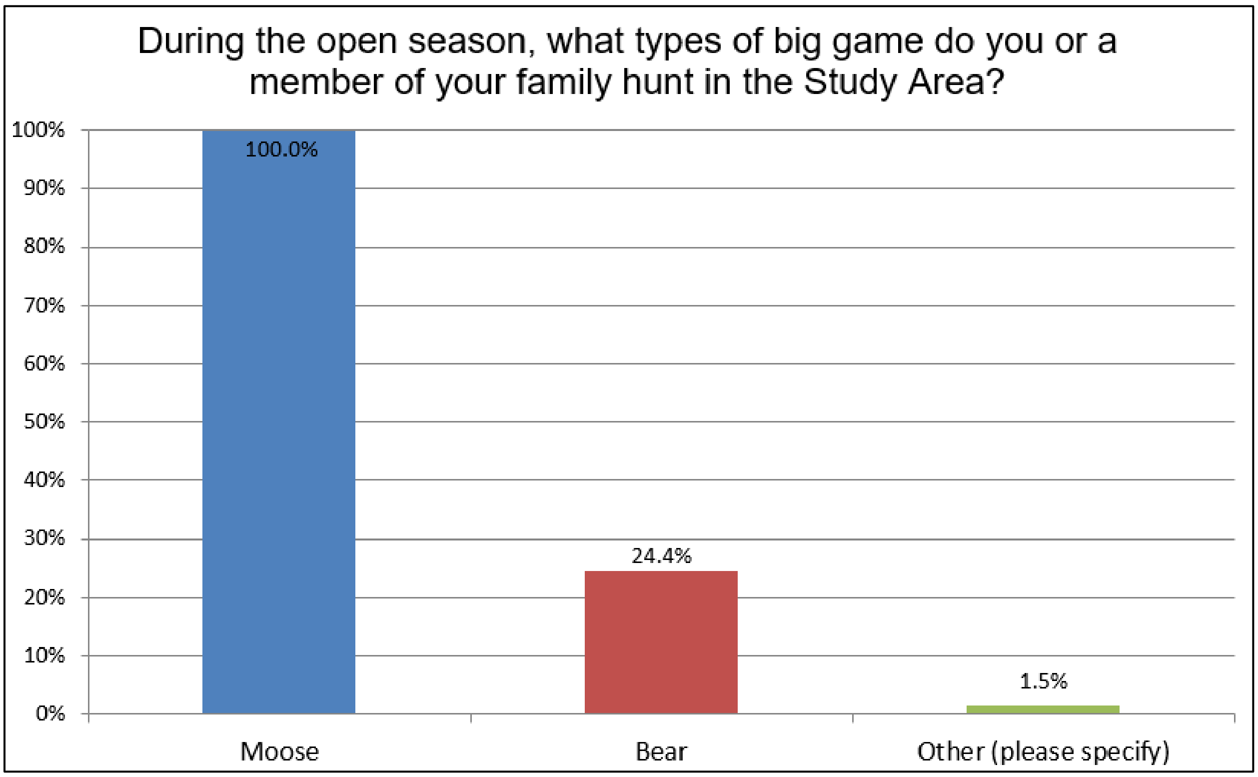


Figure 16 Species of big game hunted within the Study Area

3.2.2.3 Q15 Frequency of Big Game Hunting

The results of Q15 are presented in Figure 17. Q15 allowed participants to select only one option. Of the 418 participants, 131 responded regarding the frequency that they or a member of their family engaged in big game hunting during the open season within the Study Area, as shown on Figure 2. Approximately 13% (n=17) reported hunting big game daily, 29.8% (n=39) reported hunting big game once or twice a week, 7.6% (n=10) reported hunting big game once a month, 5.3% (n=7) reported hunting big game once every few months, 33.6% (n=44) reported hunting big game once a year, 0.8% (n=1) reported they never hunt big game, and 9.9% (n=13) reported they did not know how often they hunted big game.

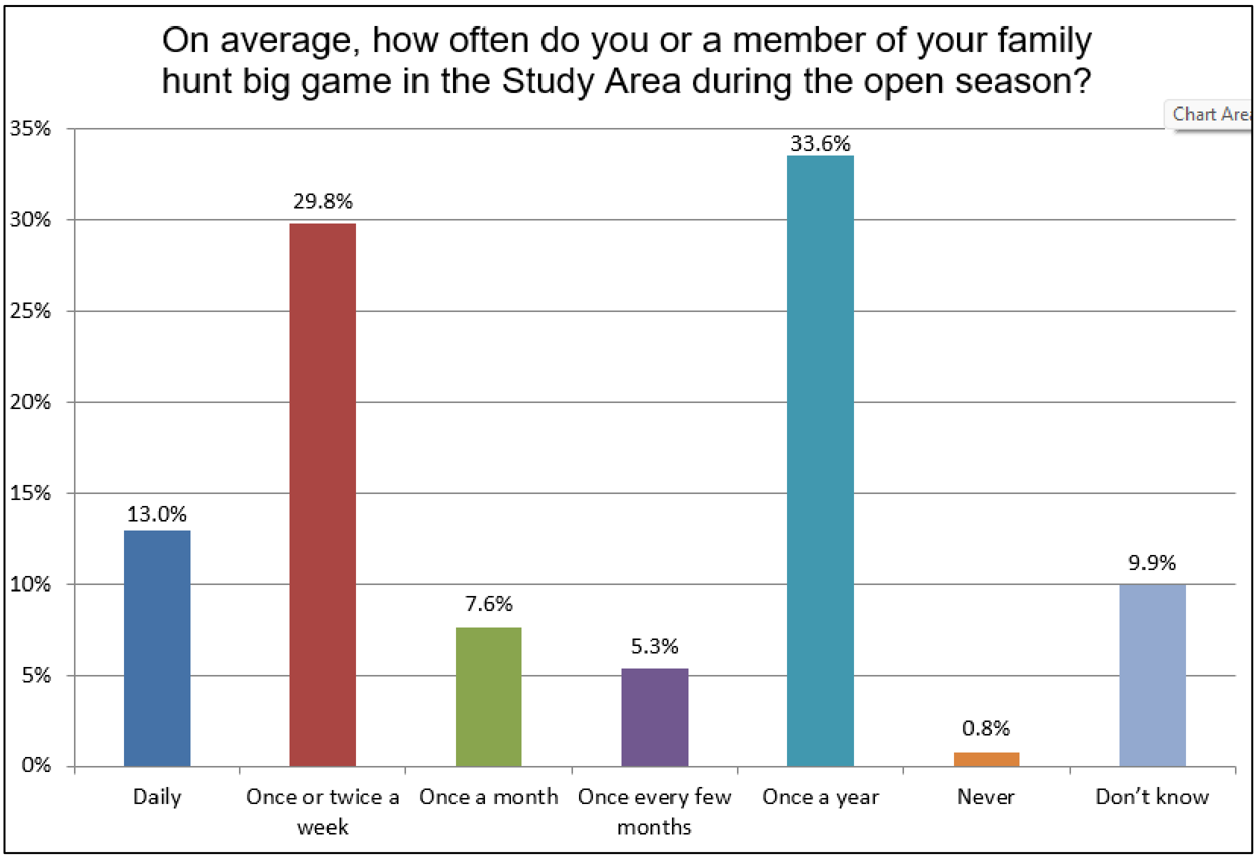


Figure 17 Frequency of big game hunting within the Study Area

3.2.2.4 Q16 Frequency of Consumption of Hunted Big Game

The results of Q16 are presented in Figure 18. Q15 allowed participants to select only one option. Of the 418 participants, 131 identified how often they consumed big game that they or someone else hunted within the Study Area, as shown on Figure 2. Approximately 6.9% (n=9) of participants reported consuming big game daily, 45% (n=59) reported consuming big game once or twice a week, 19.9% (n=26) reported consuming big game once a month, 13% (n=17) reported consuming big game once every few months, 4.6% (n=6) reported consuming big game once a year, 1.5% (n=2) reported never consuming big game, and 9.7% (n=12) reported they did not know how often they consumed big game.

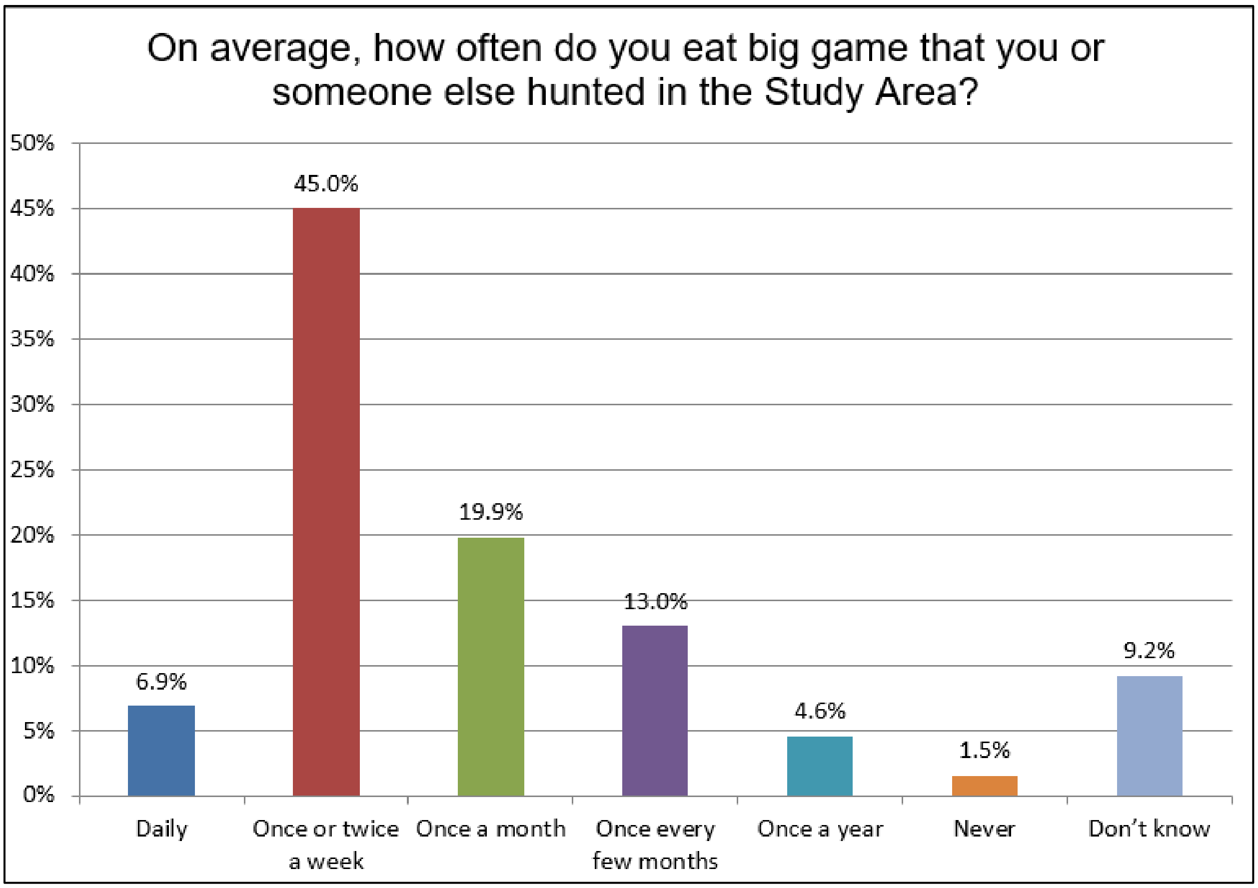


Figure 18 Frequency of consumption of big game hunted from the Study Area

3.2.3 Q17 Small Game Hunting and/or Trapping

The results of Q26 are presented in Figure 19. Of the 418 survey participants, 203 provided a response on whether they or a family member hunts and/or traps small game, such as rabbits, partridge, muskrat, or fox, within the Study Area, as shown on Figure 2. Approximately 22.2% (n=45) of participants identified that they or a family member engage in small game hunting and/or trapping within all parts of the Study Area. In addition, 3.5% (n=7) of participants identified that they engage in small game hunting and/or trapping within the Project's Area of Interest, 3.9% (n=8) within a 1 km buffer of the Project's Area of Interest, and 18.7% (n=38) within a 5 km buffer of the Project's Area of Interest. Approximately 56.2% (n=114) indicated they did not engage in small game hunting and/or trapping within the Study Area.

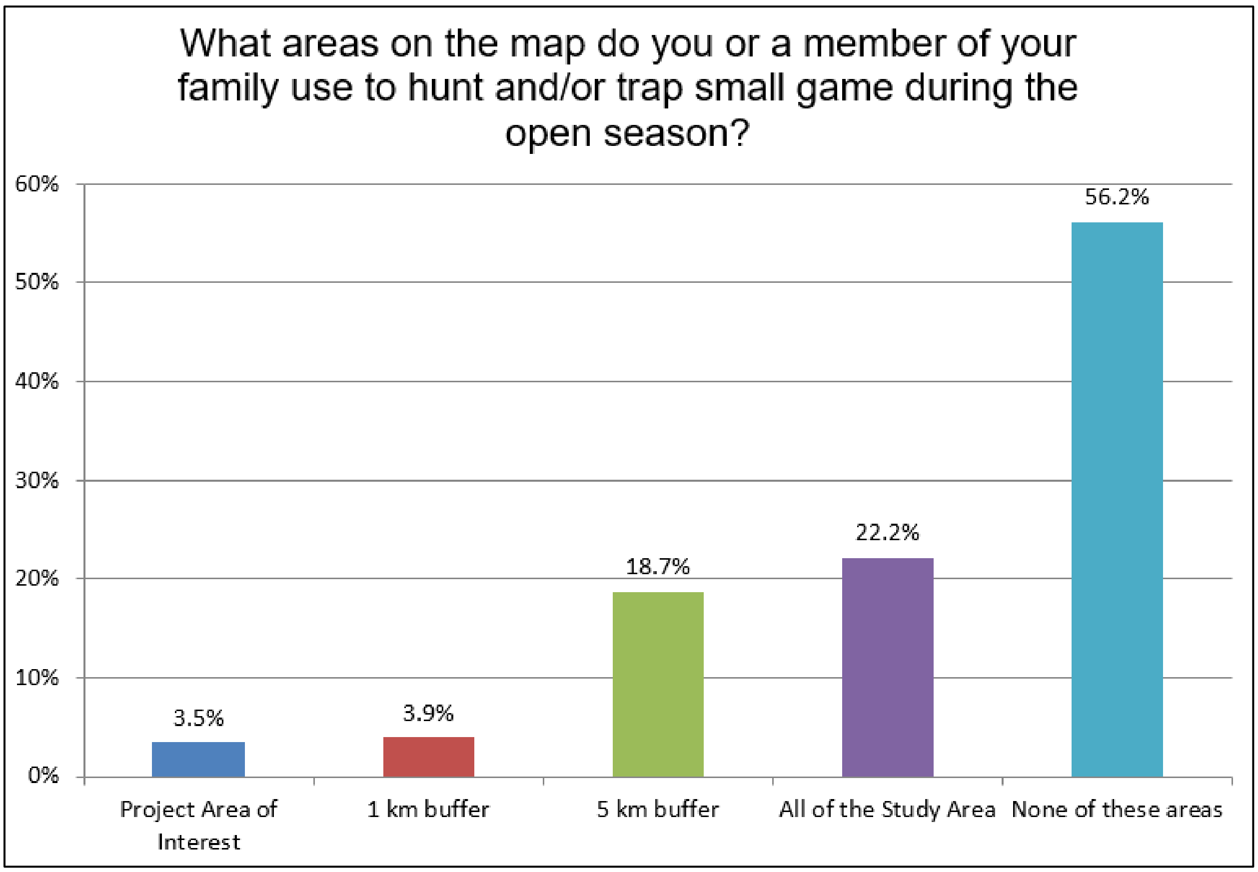


Figure 19 Small game hunting and/or trapping within the Study Area

3.2.3.1 Q18 Purpose of Small Game Hunting and/or Trapping

The results of Q18 are presented in Figure 20. Q18 allowed participants to identify one or more of the purposes for their harvest of small game within the Study Area. Of the 418 participants, 87 provided a response. Food was identified as the most common purpose for hunting and/or trapping small game (93.1%, n=81). Recreation and/or sport was identified as the second most common purpose for hunting and/or trapping small game (42.5%, n=37), followed by traditional and/or cultural purposes (12.6%, n=11), and commercial use (1.2%, n=1). No other purposes were identified by participants.

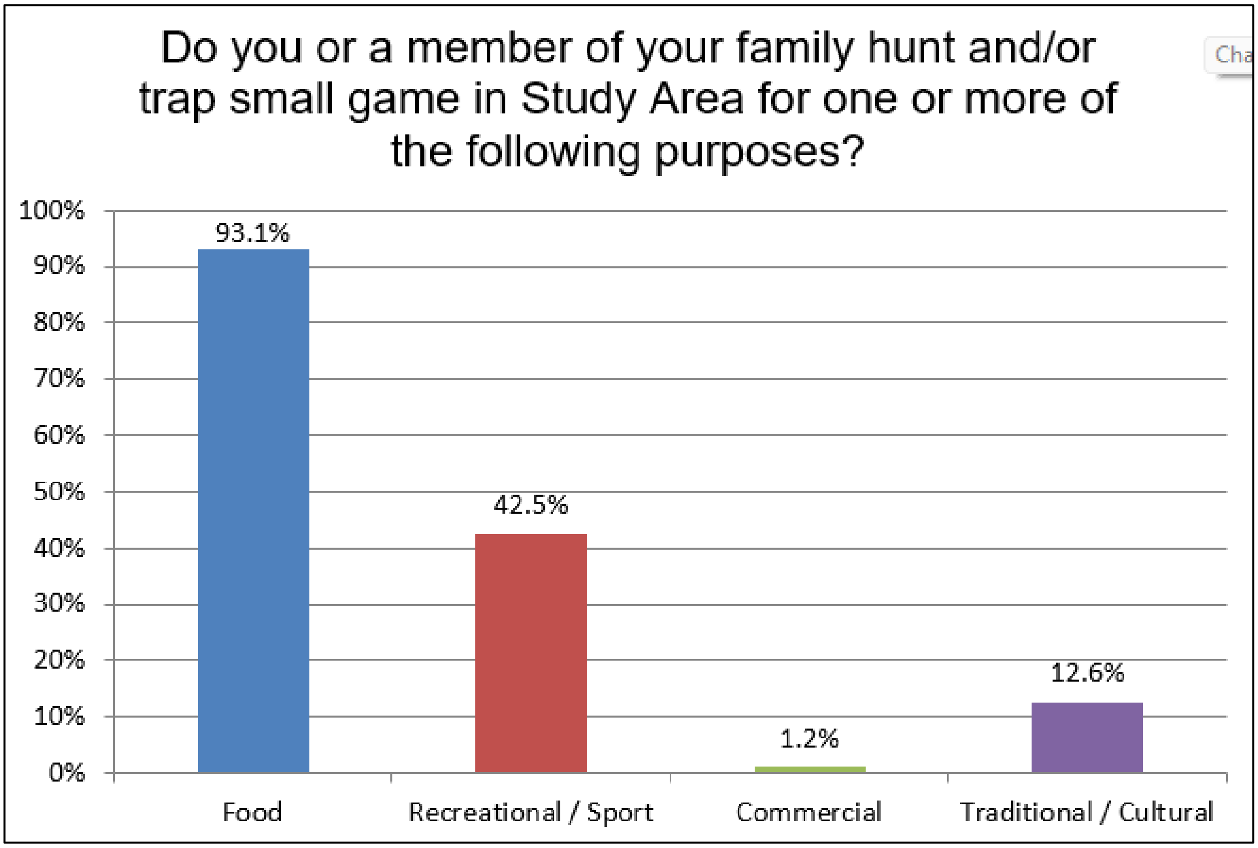


Figure 20 Purpose of small game hunting and/or trapping within the Study Area

3.2.3.2 Q19 Species of Small Game Harvested

The results of Q19 are presented in Figure 21. Q19 allowed participants to identify one or more species of small game that they, or a member of their family, hunt and/or trap within the Study Area, as shown on Figure 2. Of the 418 participants, 87 identified harvested species. Rabbit was identified as the most harvested species of small game (92%, n=80), followed by ptarmigan/grouse (64.4%, n=56), ducks (48.3%, n=42), partridge (31%, n=27), fox (5.8%, n=5), and muskrat (1.2%, n=1). Approximately 1.2% (n=1) of the participants indicated that they hunt “other” species of small game not listed. This participant indicated they hunt and/or trap coyote and otter.

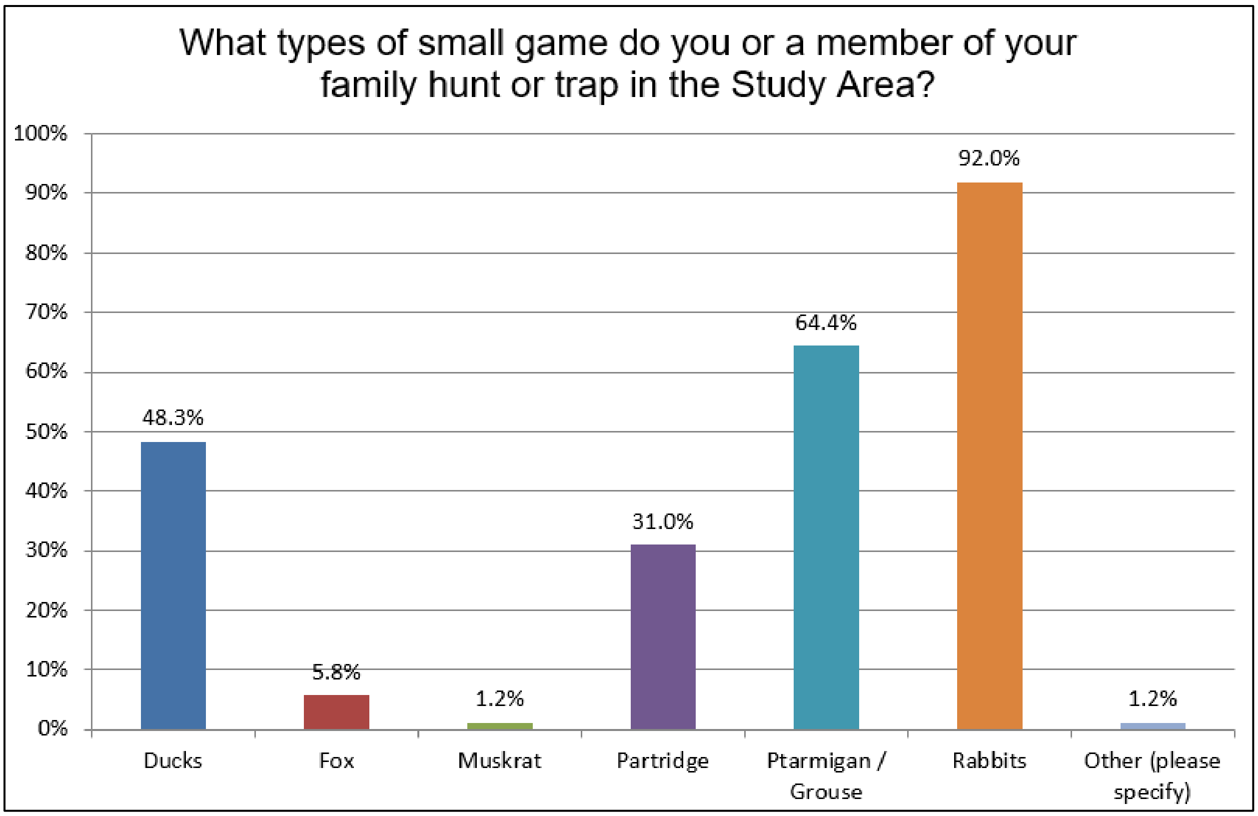


Figure 21 Species of small game harvested within the Study Area

3.2.3.3 Q20 Frequency of Small Game Hunting and/or Trapping

The results of Q20 are presented in Figure 22. Q20 allowed participants to select only one option. Of the 418 participants, 87 responded regarding the frequency that they or a member of their family engaged in small game hunting and/or trapping during the open season within the Study Area, as shown on Figure 2. Approximately 6.9% (n=6) reported hunting and/or trapping small game daily, 32.2% (n=28) reported hunting and/or trapping small game once or twice a week, 12.6% (n=11) reported hunting and/or trapping small game once a month, 16.1% (n=14) reported hunting and/or trapping small game once every few months, 18.4% (n=16) reported hunting and/or trapping small game once a year, 1.2% (n=1) reported they never hunt and/or trap small game, and 12.6% (n=11) reported they did not know how often they hunted and/or trapped small game.

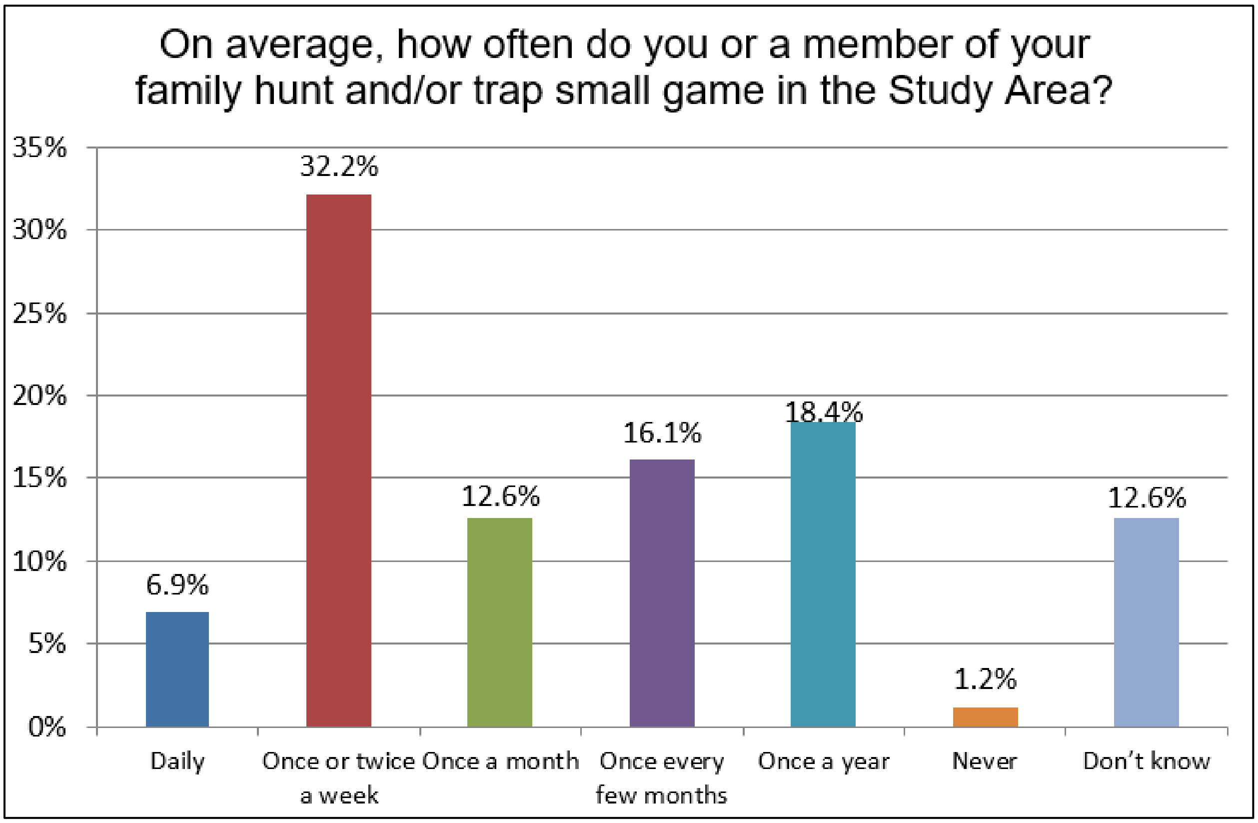


Figure 22 Frequency of small game hunting and/ or trapping within the Study Area

3.2.3.4 Q21 Frequency of Consuming Harvested Small Game

The results of Q16 are presented in Figure 18. Q16 allowed participants to select only one option. Of the 418 participants, 87 identified how often they consumed small game that they or someone else hunted or trapped within the Study Area, as shown on Figure 2. Approximately 2.3% (n=2) of participants reported consuming small game daily, 23% (n=20) reported consuming small game once or twice a week, 31% (n=27) reported consuming small game once a month, 24.1% (n=21) reported consuming small game once every few months, 5.8% (n=5) reported consuming small game once a year, 5.8% (n=5) reported never consuming small game, and 8.1% (n=7) reported they did not know how often they consumed small game.

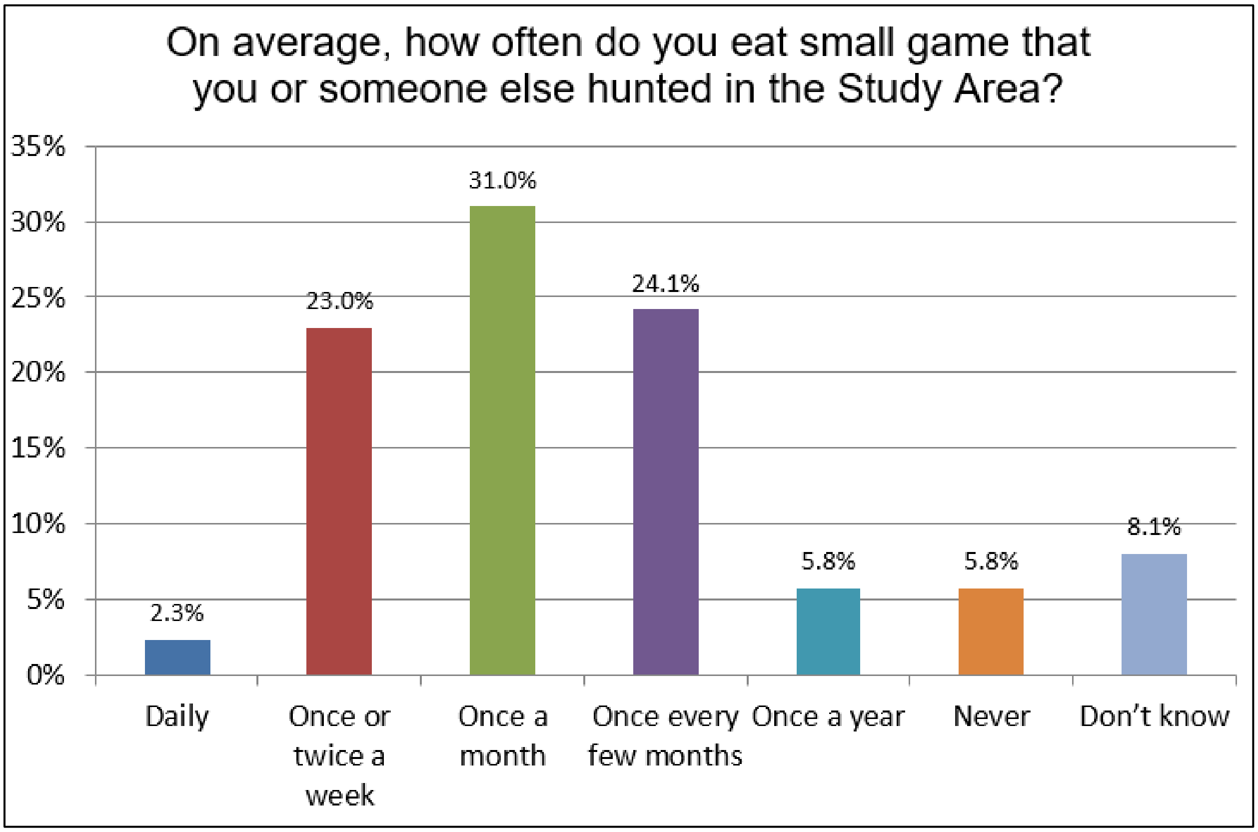


Figure 23 Frequency of consuming small game harvested from the Study Area

3.2.4 Q22 Freshwater Fishing

The results of Q22 are presented in Figure 24. Of the 418 survey participants, 199 provided a response on whether they or a family member catch freshwater fish within the Study Area, as shown on Figure 2. Approximately 18.1% (n=36) of participants identified that they or a family member engage in freshwater fishing within all parts of the Study Area. In addition, 2.5% (n=5) of participants identified that they engage within the Project's Area of Interest, 5% (n=10) within a 1 km buffer of the Project's Area of Interest, and 27.1% (n=54) within a 5 km buffer of the Project's Area of Interest. Approximately 51.8% (n=103) indicated they did not engage in freshwater fishing within the Study Area.

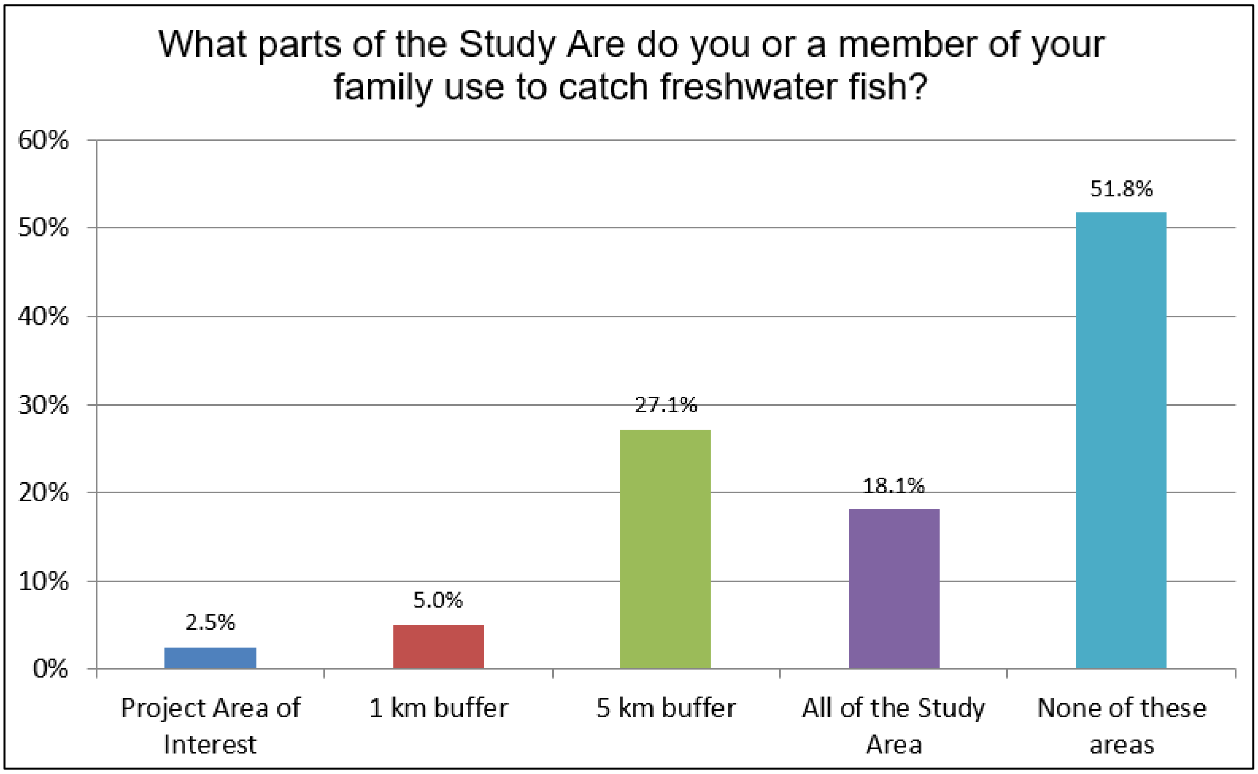


Figure 24 Freshwater fishing within the Study Area

3.2.4.1 Q23 Purpose of Freshwater Fishing

The results of Q23 are presented in Figure 25. Q23 allowed participants to identify one or more of the purposes for their harvest of freshwater fish from the Study Area, as shown on Figure 2. Of the 418 participants, 199 provided a response. Food was identified as the most common purpose for freshwater fishing (91.3%, n=84). Recreation and/or sport was identified as the second most common purpose for freshwater fishing (59.8%, n=55), followed by traditional and/or cultural purposes (8.7%, n=8), and commercial use (1.1%, n=1). Approximately 1.1% (n=1) of the participants chose the “other” option to indicate that they “never” harvest freshwater fish.

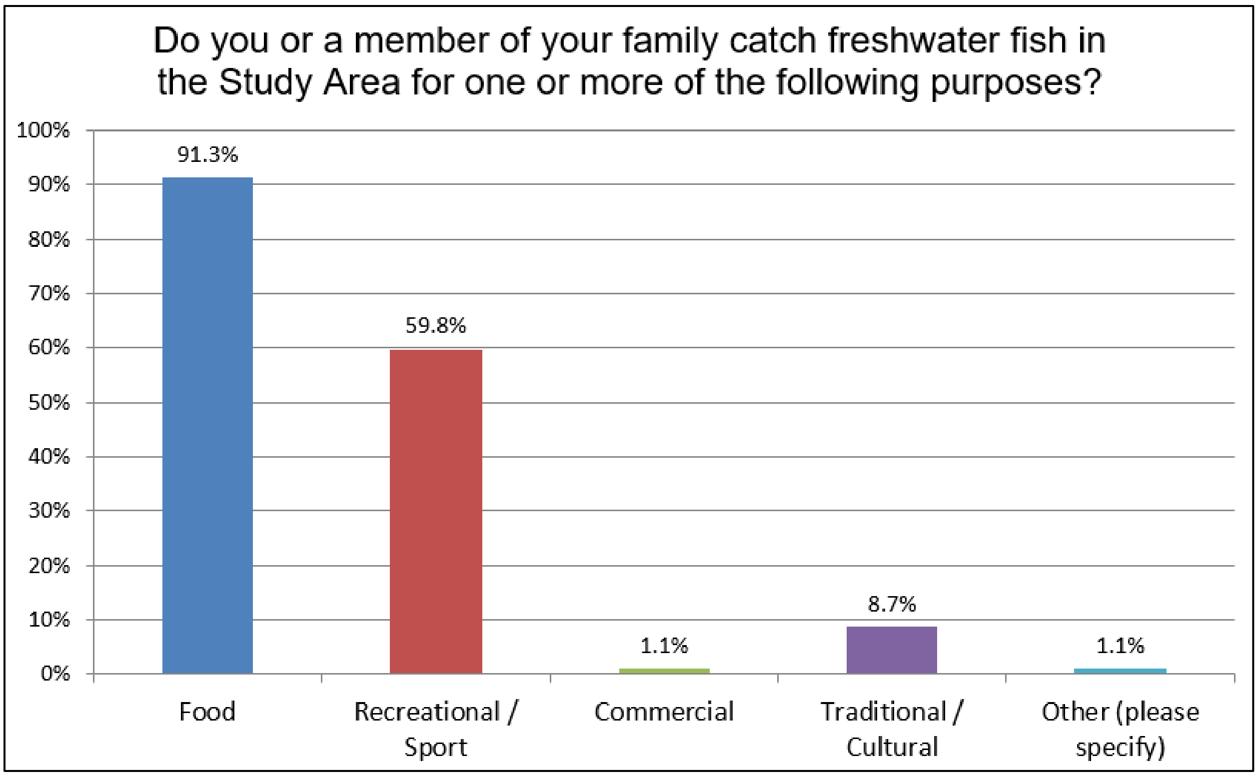


Figure 25 Purpose of freshwater fishing within the Study Area

3.2.4.2 Q24 Harvested Freshwater Fish

The results of Q24 are presented in Figure 26. Q24 allowed participants to identify one or more species of fish that they, or a member of their family fish within the Study Area, as shown on Figure 2. Of the 418 participants, 92 identified harvested species. Brook trout was identified as the most harvested species of fish (84.8%, n=78), followed by brown trout (47.8%, n=44), rainbow trout (26.1%, n=24), and Atlantic salmon (21.7%, n=20). Other species identified by less than 2% of participants included American eel (n=1), American char (n=1), lake whitefish (n=1), northern pike (n=1), and rainbow/American smelt (n=1). Approximately 4.4% (n=4) of participants indicated that they fish “other” species that were not listed. One of these participants noted they harvest “trout,” another noted they did not know the name of the species they harvested, and another commented "Don’t eat the fish.” The remaining response was the single letter “I.”

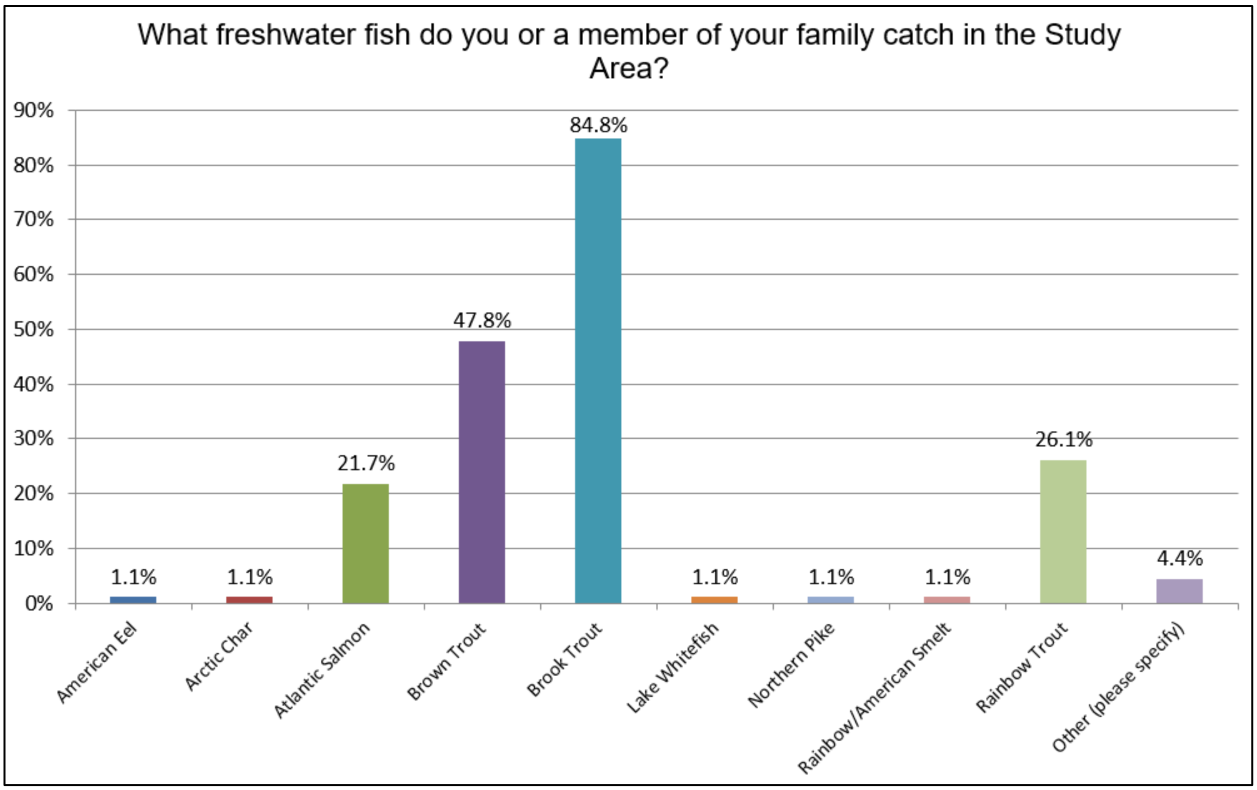


Figure 26 Harvested freshwater fish within the Study Area

3.2.4.3 Q25 Frequency of Freshwater Fishing

The results of Q25 are presented in Figure 27. Q25 allowed participants to select only one option. Of the 418 participants, 92 responded regarding the frequency that they or a member of their family engaged in freshwater fishing within the Study Area, as shown on Figure 2. Approximately 1.1% (n=1) reported fishing freshwater fish daily, 21.7% (n=20) reported fishing freshwater fish once or twice a week, 16.3% (n=15) reported fishing freshwater fish once a month, 34.8% (n=32) reported fishing freshwater fish once every few months, 14.1% (n=13) reported fishing freshwater fish once a year, 1.1% (n=1) reported they never fish freshwater fish, and 10.9% (n=10) reported they did not know how often they fished freshwater fish.

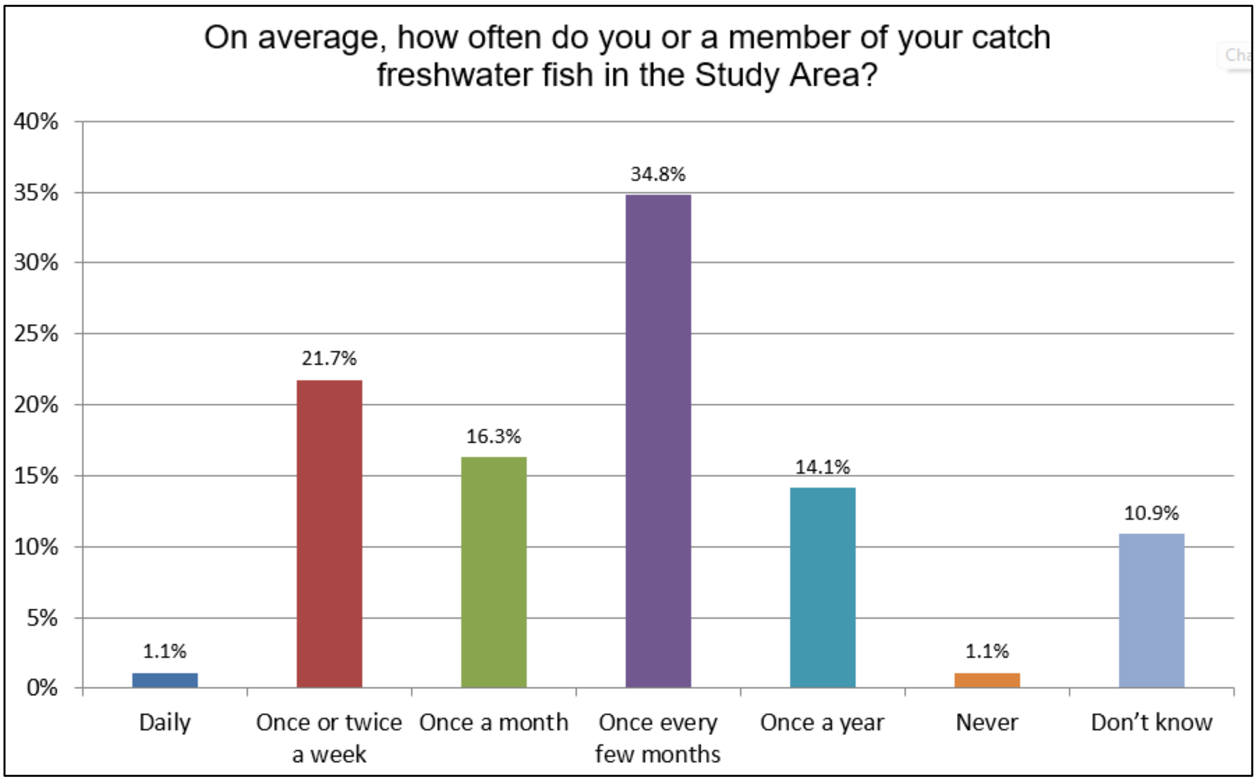


Figure 27 Frequency of freshwater fishing within the Study Area

3.2.4.4 Q26 Frequency of Consuming Harvested Freshwater Fish

The results of Q26 are presented in Figure 28. Q26 allowed participants to select only one option. Of the 418 participants, 92 identified how often they consumed freshwater fish that they or someone else fished within the Study Area, as shown on Figure 2. Approximately 1.1% (n=1) of participants reported consuming harvested freshwater fish daily, 17.4% (n=16) reported consuming harvested freshwater fish once or twice a week, 28.3% (n=26) reported consuming harvested freshwater fish once a month, 32.6% (n=30) reported consuming harvested freshwater fish once every few months, 9.8% (n=9) reported consuming harvested freshwater fish once a year, 4.4% (n=4) reported never consuming harvested freshwater fish, and 6.5% (n=6) reported they did not know how often they consumed harvested freshwater fish.

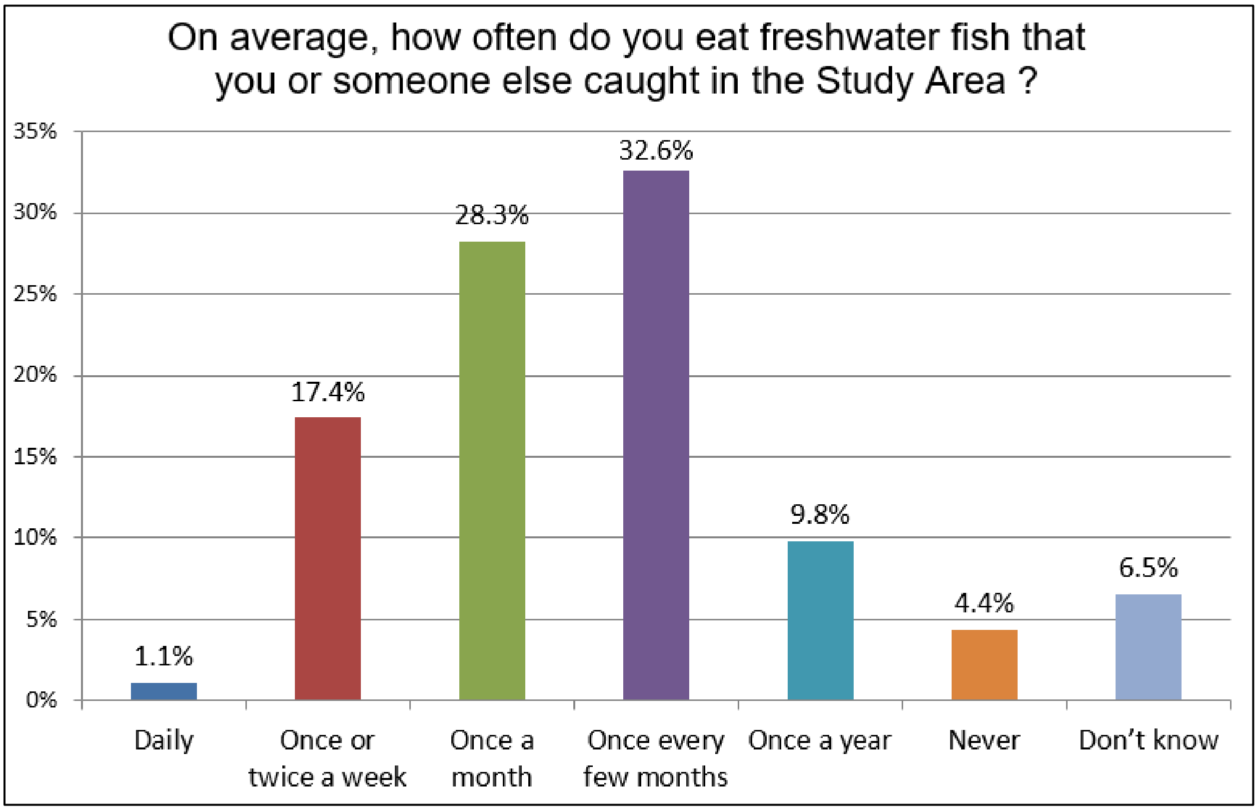


Figure 28 Frequency of consuming freshwater fish harvested from the Study Area

3.2.5 Q27 Wild Berry and/or Wild Plant Harvesting

The results of Q27 are presented in Figure 29. Of the 418 survey participants, 195 provided a response on whether they or a family member pick wild berries and/or harvest other wild plants within the Study Area, as shown on Figure 2. Approximately 21.5% (n=42) of participants identified that they or a family member engage in berry picking and/or plant harvesting within all parts of the Study Area. In addition, 2.6% (n=5) of participants identified that they engage in berry picking and/or plant harvesting the Project's Area of Interest, 4.1% (n=8) within a 1 km buffer of the Project's Area of Interest, and 16.4% (n=32) within a 5 km buffer of the Project's Area of Interest. Approximately 60% (n=117) indicated they did not engage in berry picking and/or plant harvesting in the Study Area.

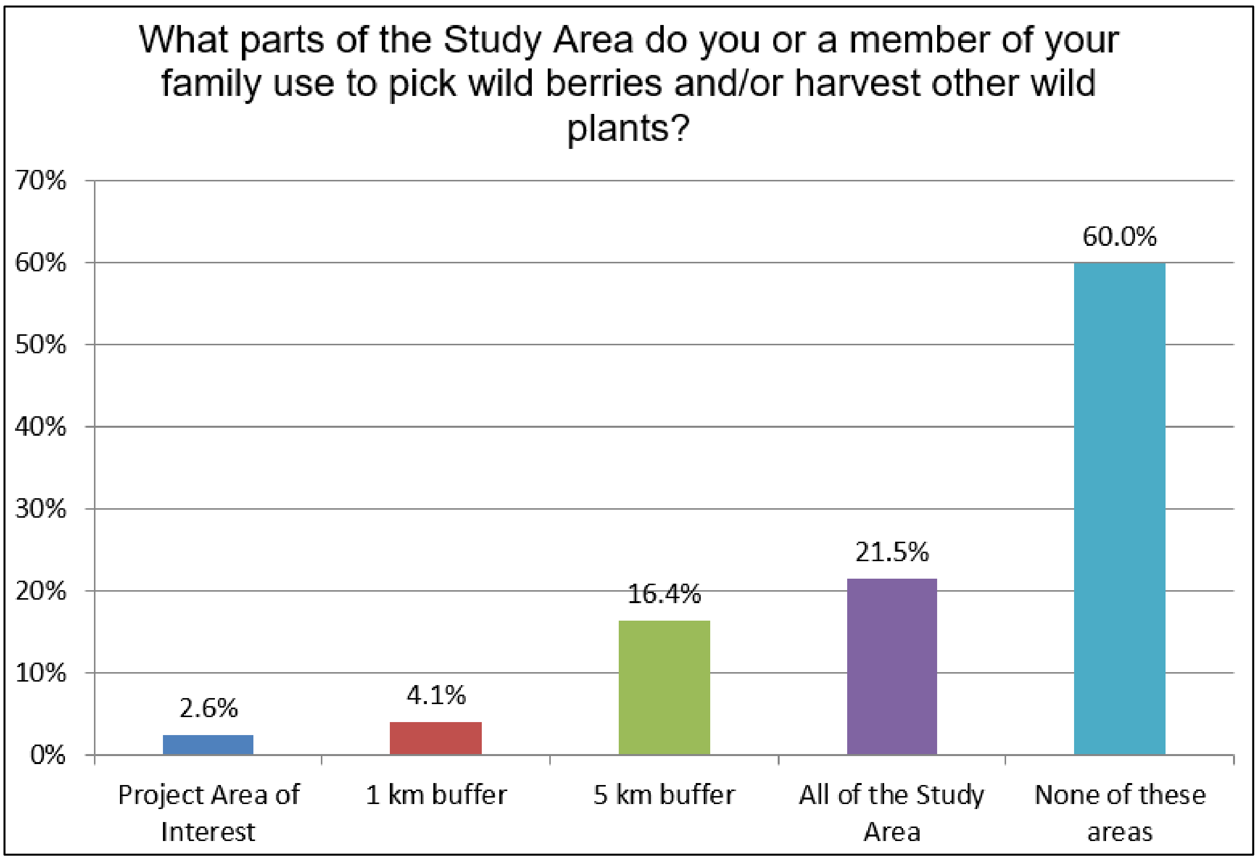


Figure 29 Wild berry and/or plant harvesting within the Study Area

3.2.5.1 Q28 Purpose of Wild Berry/Plant Harvesting

The results of Q28 are presented in Figure 30. Q28 allowed participants to identify one or more of the purposes for their harvest of wild berries and/or plants from the Study Area, as shown on Figure 2. Of the 418 participants, 77 provided a response. Food was identified as the most common purpose for harvesting wild berries and/or plants (98.7%, n=76). Recreation and/or sport was identified as the second most common purpose for harvesting wild berries and/or plants (22.1%, n=17), followed by traditional and/or cultural purposes (10.4%, n=8), and medicinal use (2.6%, n=2).

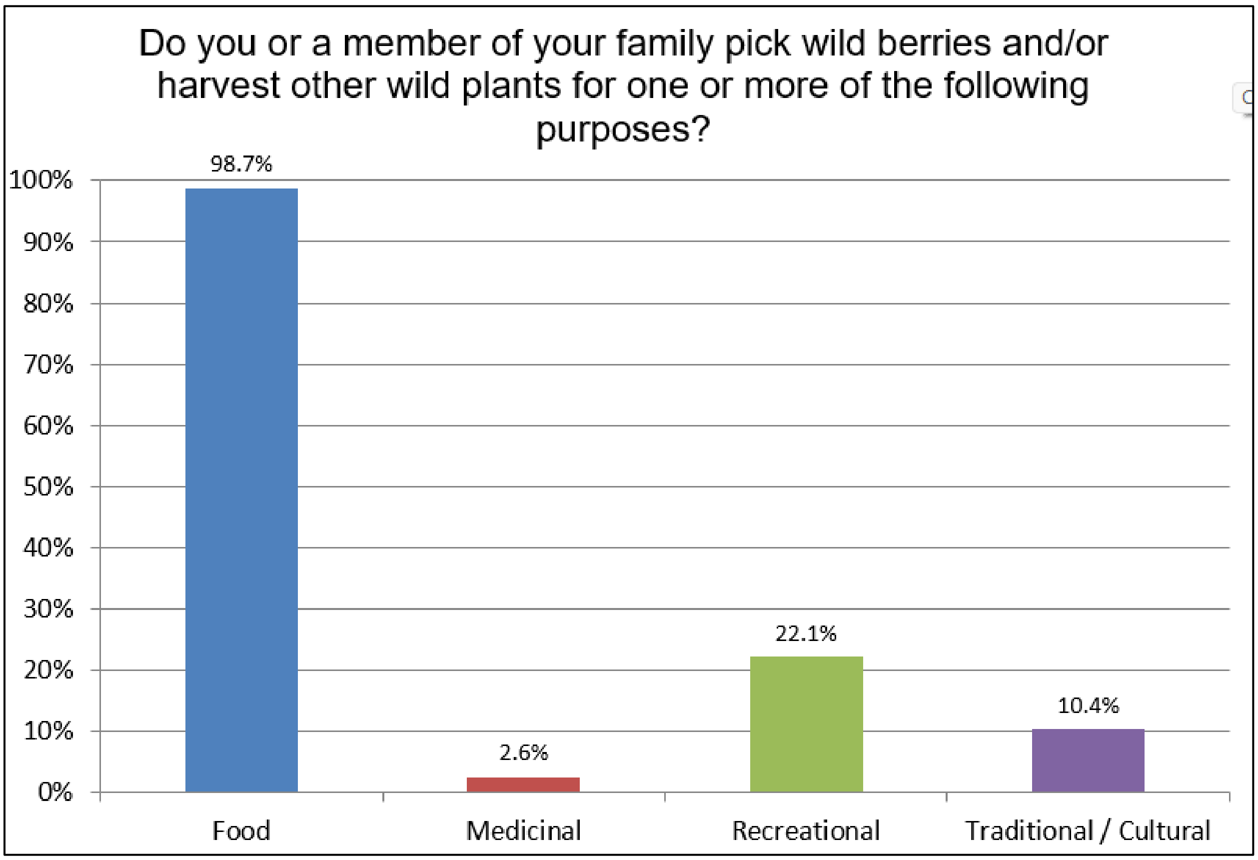


Figure 30 Purpose of wild berry/plant harvesting within the Study Area

3.2.5.2 Q29 Harvested Wild Berries and/or Plants

The results of Q24 are presented in Figure 26. Q24 allowed participants to identify one or more species of wild berries and/or plants that they, or a member of their family harvest within the Study Area, as shown on Figure 2. Of the 418 participants, 77 identified harvested species. Blueberries was identified as the most harvested species (93.6%, n=72), followed by partridge berries (75.3%, n=58), raspberries (68.8%, n=53), squash berries (40.3%, n=31), bakeapples (39%, n=30), wild strawberries (10.4%, n=8), and blackberries (5.2%, n=4). Other species identified by less than 3% of participants included fireweed (n=2), labrador tea (n=2), low brush juniper (n=2), mushrooms (n=2), and wild cranberries (n=1). Only one participant indicated they did not know what species of wild berries or plants they harvested by using the "other" category.

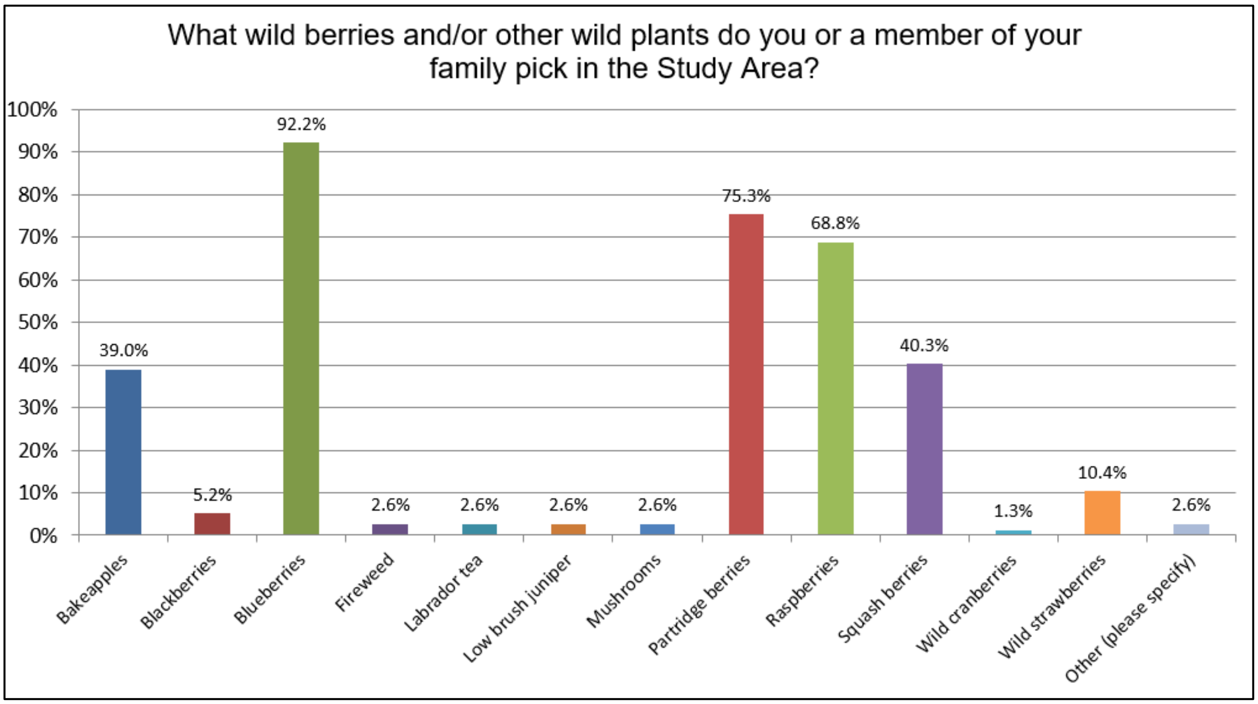


Figure 31 Harvested wild berries and/or plants within the Study Area

3.2.5.3 Q30 Frequency of Wild Berry/Plant Harvesting

The results of Q30 are presented in Figure 32. Q30 allowed participants to select only one option. Of the 418 participants, 77 responded regarding the frequency that they or a member of their family engaged in berry picking/plant harvesting within the Study Area, as shown on Figure 2. Approximately 6.5% (n=5) berry picking/plant harvesting daily, 20.8% (n=16) reported berry picking/plant harvesting once or twice a week, 13% (n=10) reported berry picking/plant harvesting once a month, 15.6% (n=12) reported berry picking/plant harvesting once every few months, 36.4% (n=28) reported berry picking/plant harvesting once a year, and 7.8% (n=6) reported they did not know how often they picked berries or harvested plants.

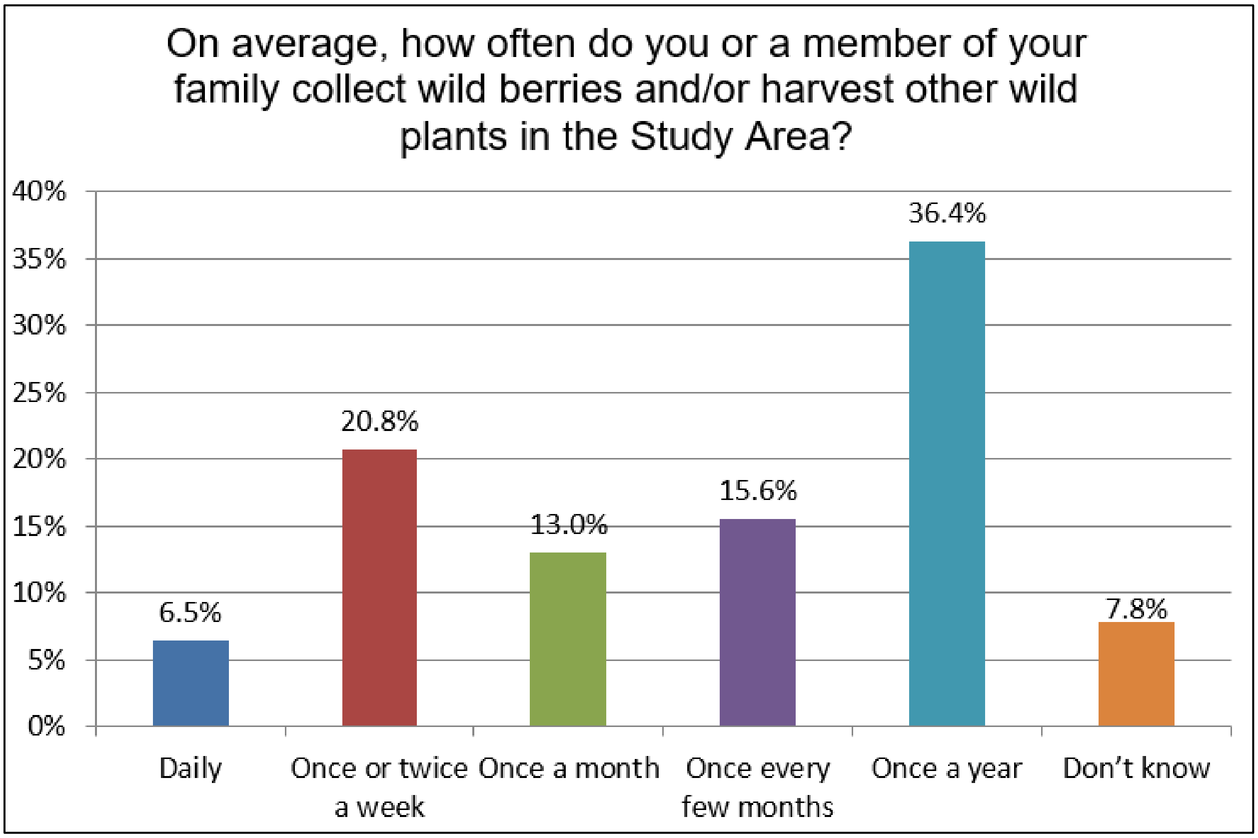


Figure 32 **Frequency of wild berry/plant harvesting within the Study Area**

3.2.5.4 Q31 Frequency of Consuming Harvested Wild Berries/Plants

The results of Q31 are presented in Figure 33. Q31 allowed participants to select only one option. Of the 418 participants, 92 identified how often they consumed wild berries and/or plants that they or someone else harvested within the Study Area, as shown on Figure 2. Approximately 13% (n=10) of participants reported consuming harvested wild berries/plants daily, 51% (n=39) reported consuming harvested wild berries/plants once or twice a week, 16.9% (n=13) reported consuming harvested wild berries/plants once a month, 7.8% (n=6) reported consuming harvested wild berries/plants once every few months, 5.2% (n=4) reported consuming harvested wild berries/plants once a year, and 6.5% (n=5) reported they did not know how often they consumed harvested wild berries/plants.

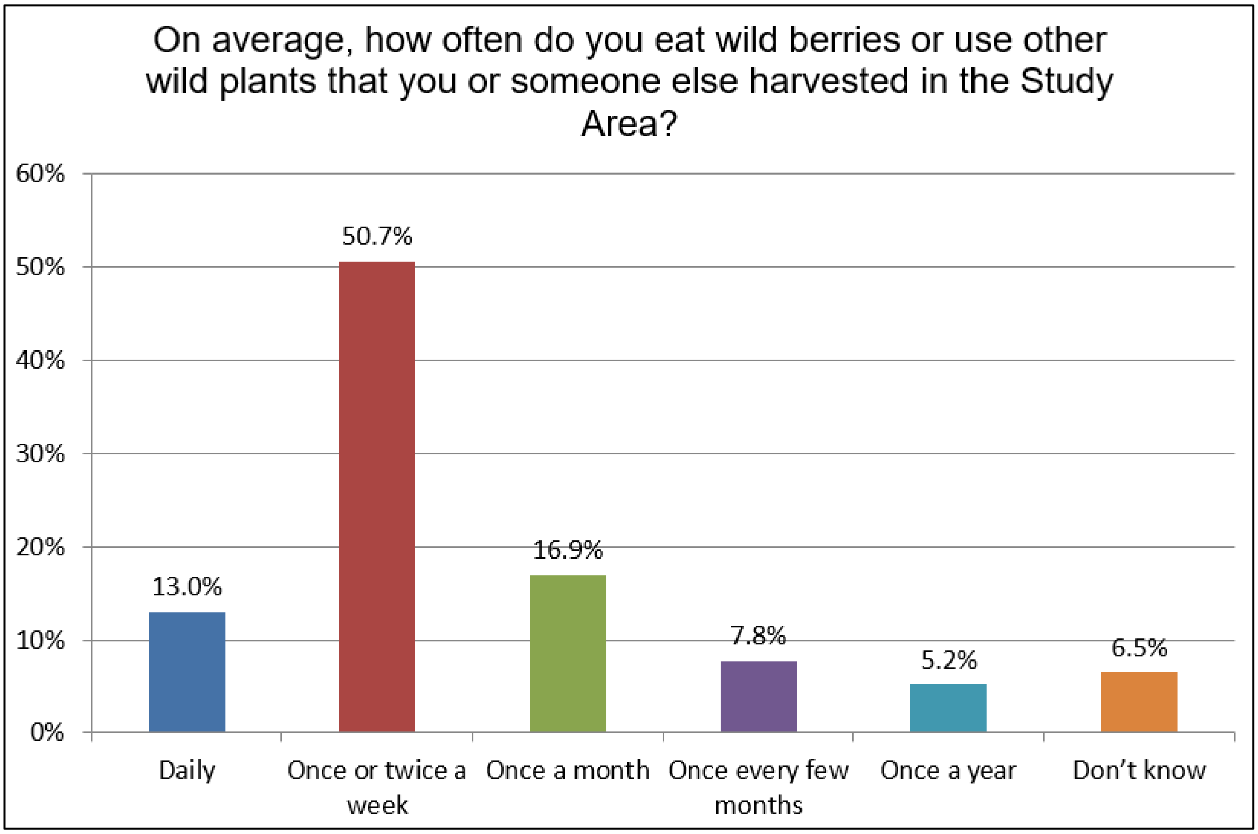


Figure 33 Frequency of consuming wild berries/plants harvested from the Study Area

3.2.6 Q32 Domestic Wood Cutting Activities

The results of Q32 are presented in Figure 34. Of the 418 survey participants, 190 provided a response on whether they or a family member cut wood under a provincial Domestic Wood Cutting Permit within the Study Area, as shown on Figure 2. Approximately 18.4% (n=35) of participants identified that they or a family member engage in domestic wood cutting within all parts of the Study Area. In addition, 0.5% (n=1) of participants identified that they engage domestic wood cutting within the Project's Area of Interest, 1.6% (n=3 within a 1 km buffer of the Project's Area of Interest, and 18.4% (n=35) within a 5 km buffer of the Project's Area of Interest. Approximately 61.1 % (n=116) indicated they did not engage in domestic wood cutting within the Study Area.

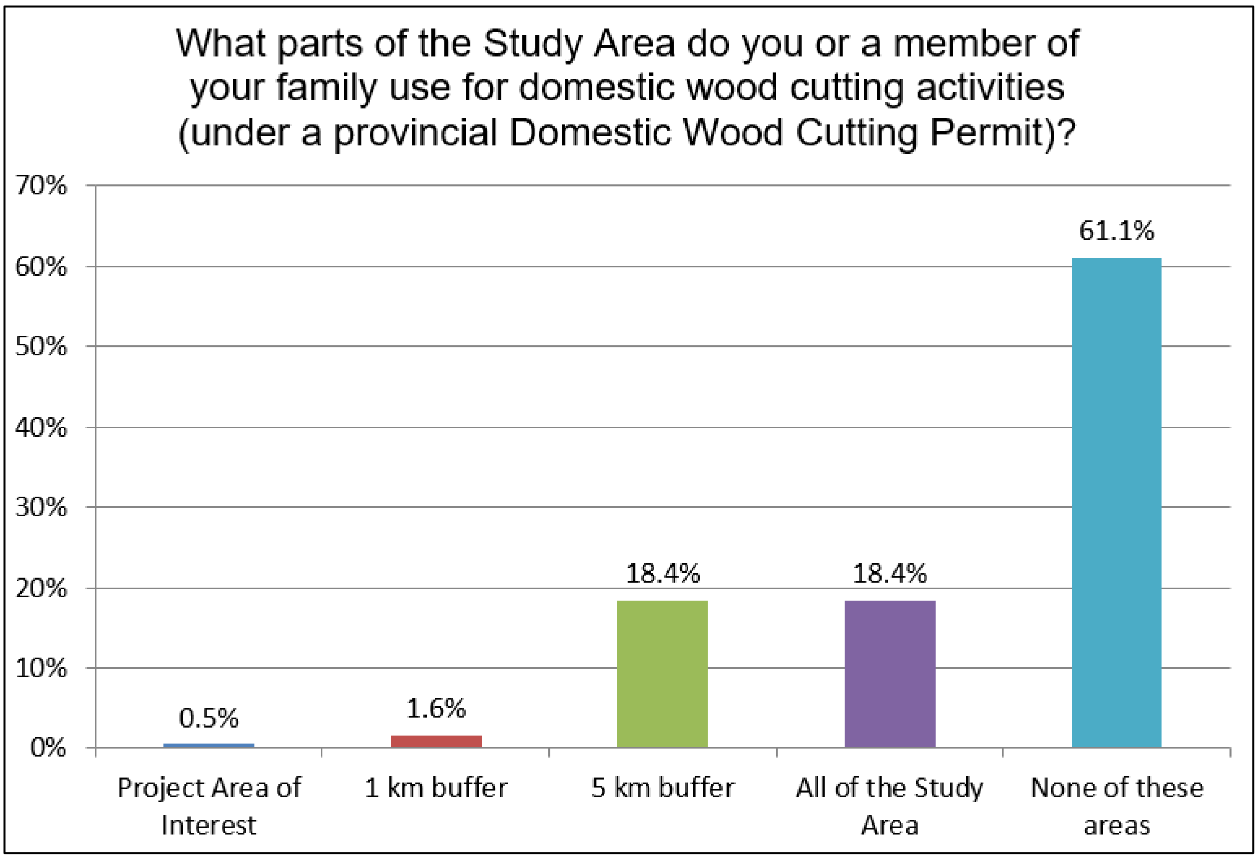


Figure 34 Domestic wood cutting activities within the Study Area

3.2.6.1 Q33 Frequency of Domestic Wood Cutting

The results of Q33 are presented in Figure 35. Q33 allowed participants to select only one option. Of the 418 participants, 71 responded regarding the frequency that they or a member of their family engaged in domestic wood cutting activities (under a provincial Domestic Wood Cutting Permit) within the Study Area, as shown on Figure 2. Approximately 18.3% (n=13) reported domestically cutting wood daily, 23.9% (n=17) reported domestically cutting wood once or twice a week, 7% (n=5) reported domestically cutting wood once a month, 15.5% (n=11) reported domestically cutting wood once every few months, 22.5% (n=16) reported domestically cutting wood once a year, 1.4% (n=1) reported they never domestically cut wood, and 11.3% (n=8) reported they did not know how often they domestically cut wood.

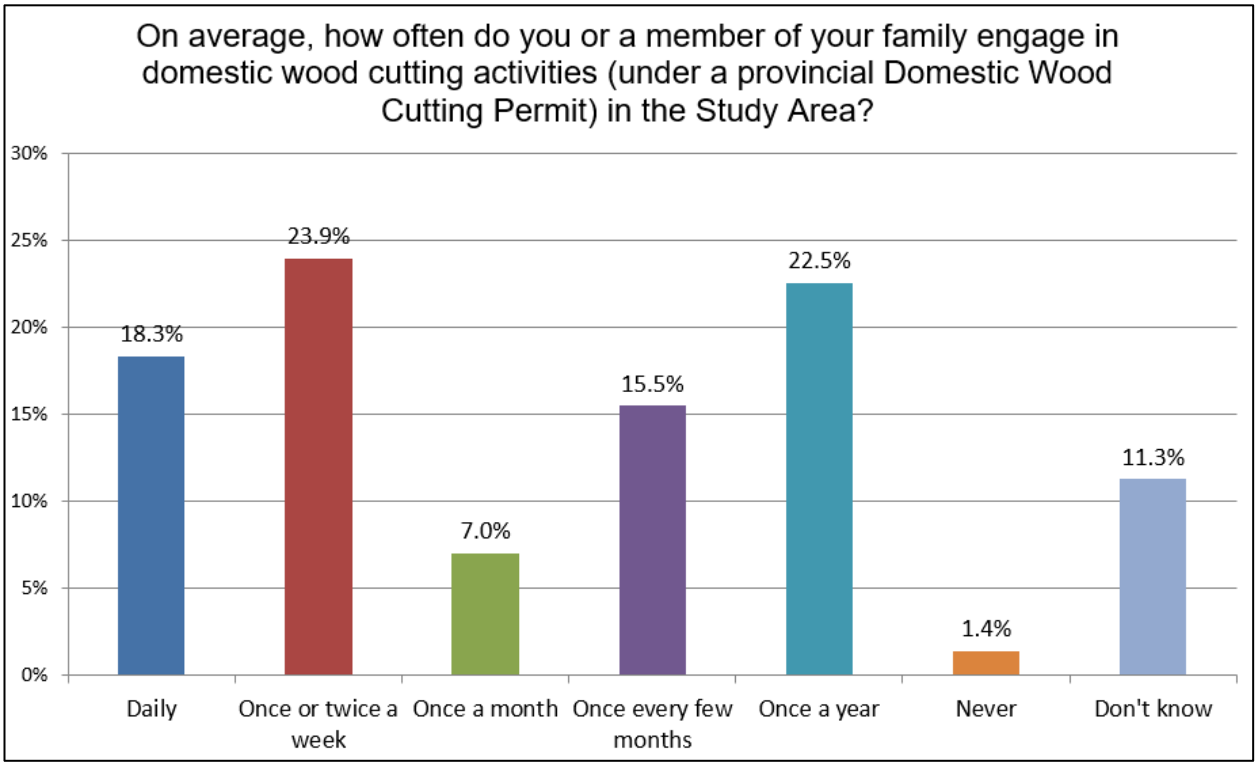


Figure 35 Frequency of domestic wood cutting within the Study Area

3.2.6.2 Q34 Purpose of Domestic Wood Cutting

The results of Q34 are presented in Figure 36. Q34 allowed participants to identify one or more of the purposes for their domestic wood cutting within the Study Area, as shown on Figure 2. Of the 418 participants, 77 provided a response. Approximately 93% (n=66) of participants indicated they engaged in domestic wood cutting for heating their home, cabin, shed, garage, or other buildings. The next most common purpose for domestic wood cutting was identified as for general firewood collection (31%, n=22), followed by domestic/home construction (including fences and other structures) (15.5%, n=11), cooking food (14.1%, n=10), Christmas tree cutting (11.3%, n=8), traditional/cultural activities (8.5%, n=6), gifts for other individuals (7%, n=5), and artisanal products such as furniture, art, toys, and instruments (4.2%, n=3). Three participants (4.2%) indicated they engage in domestic wood cutting for one “other” purpose, including selling wood commercially. The remaining two comments stated, “don’t burn wood,” and “shed.”

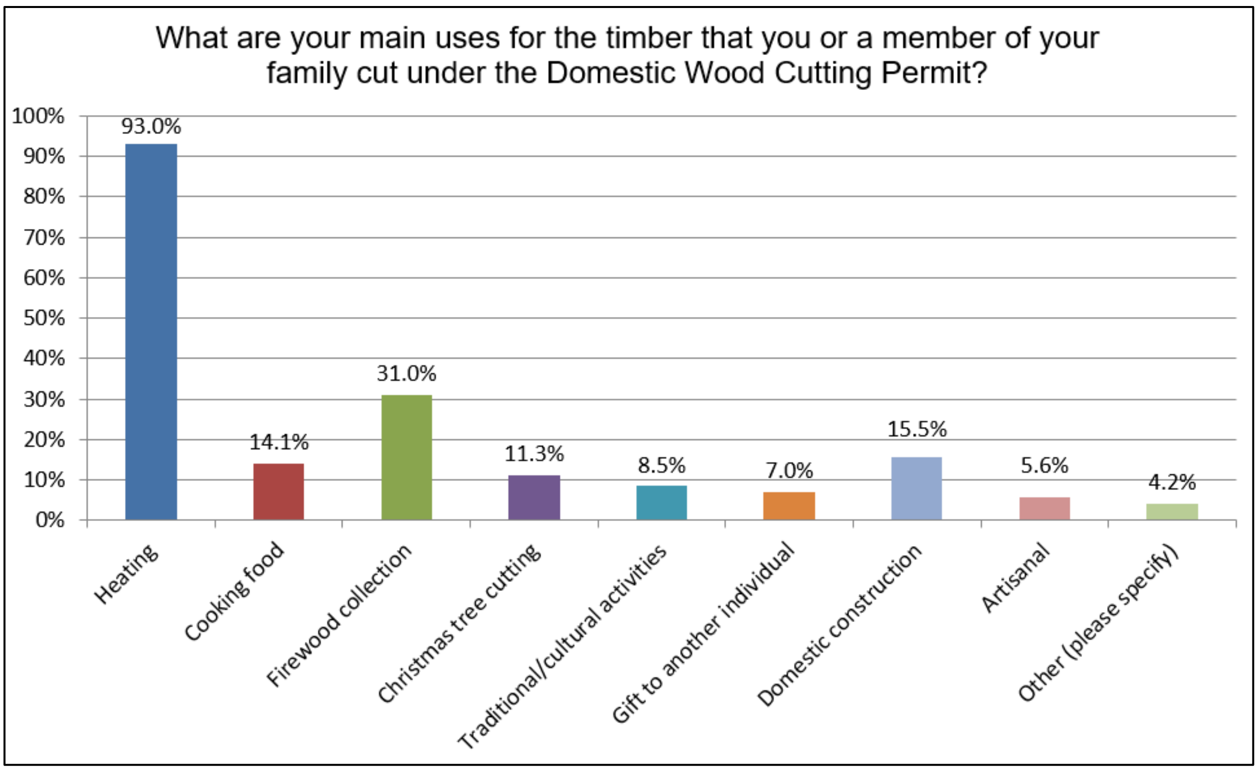


Figure 36 Purpose of domestic wood cutting within the Study Area

3.2.7 Q35 Water Use

The results of Q35 are presented in Figure 34. Of the 418 survey participants, 187 provided a response on whether they or a family member sourced drinking water, or water used for bathing, cooking, cleaning, or other household tasks from within the Study Area, as shown on Figure 2. Approximately 21.9% (n=41) of participants indicated they sourced water within the Study Area, while 78.1% (n=146) indicated they did not.

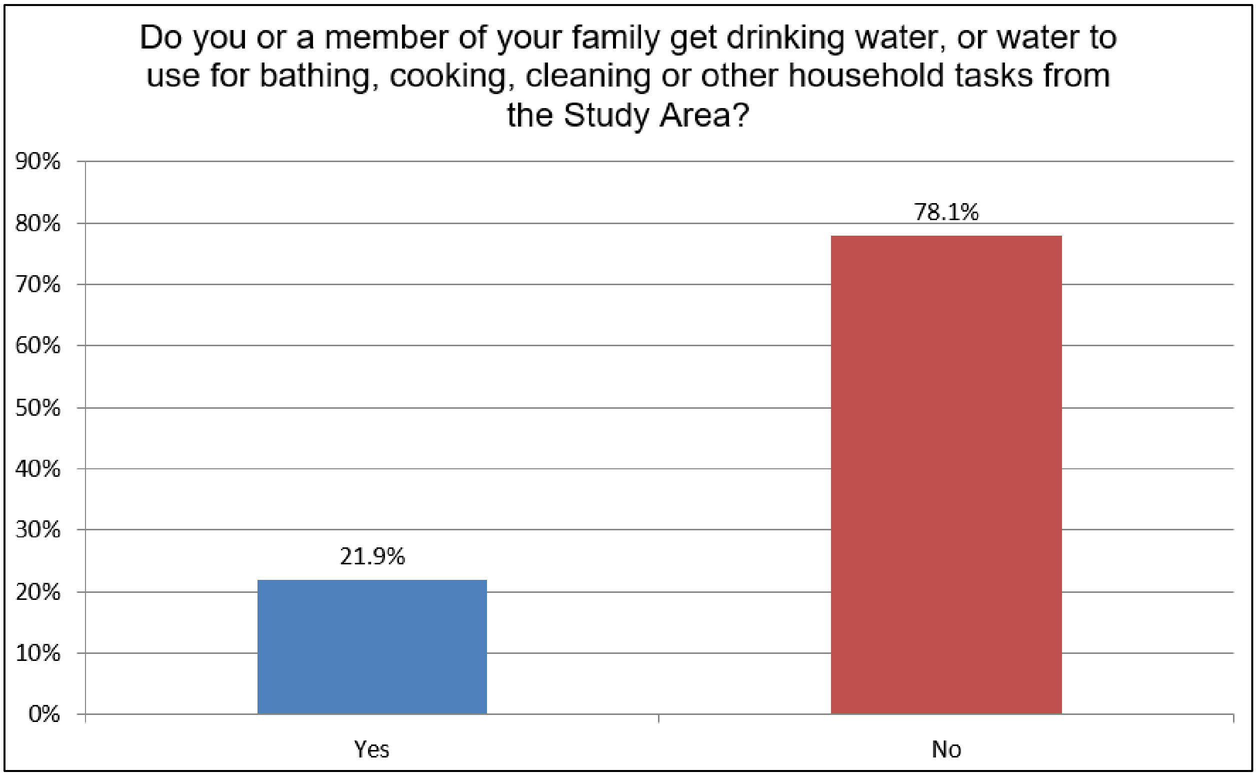


Figure 37 Water use within the Study Area

3.2.7.1 Q36 Drinking Water Source Locations

The results of Q96 are presented in Figure 38. Of the 418 survey participants, 40 provided a response on whether they or a family member source drinking water from a municipal supply, private well, or natural spring located within the Study Area, as shown on Figure 2. Approximately 15% (n=6) of participants identified that they or a family member sourced drinking water within all parts of the Study Area. In addition, 5% (n=2) of participants identified that they sourced drinking water within the Project Area of Interest, 5% (n=2) within a 1 km buffer of the Project's Area of Interest, and 62.5% (n=25) within a 5 km buffer of the Project's Area of Interest. Approximately 15% (n=6) indicated they did not source drinking water in any of these areas.

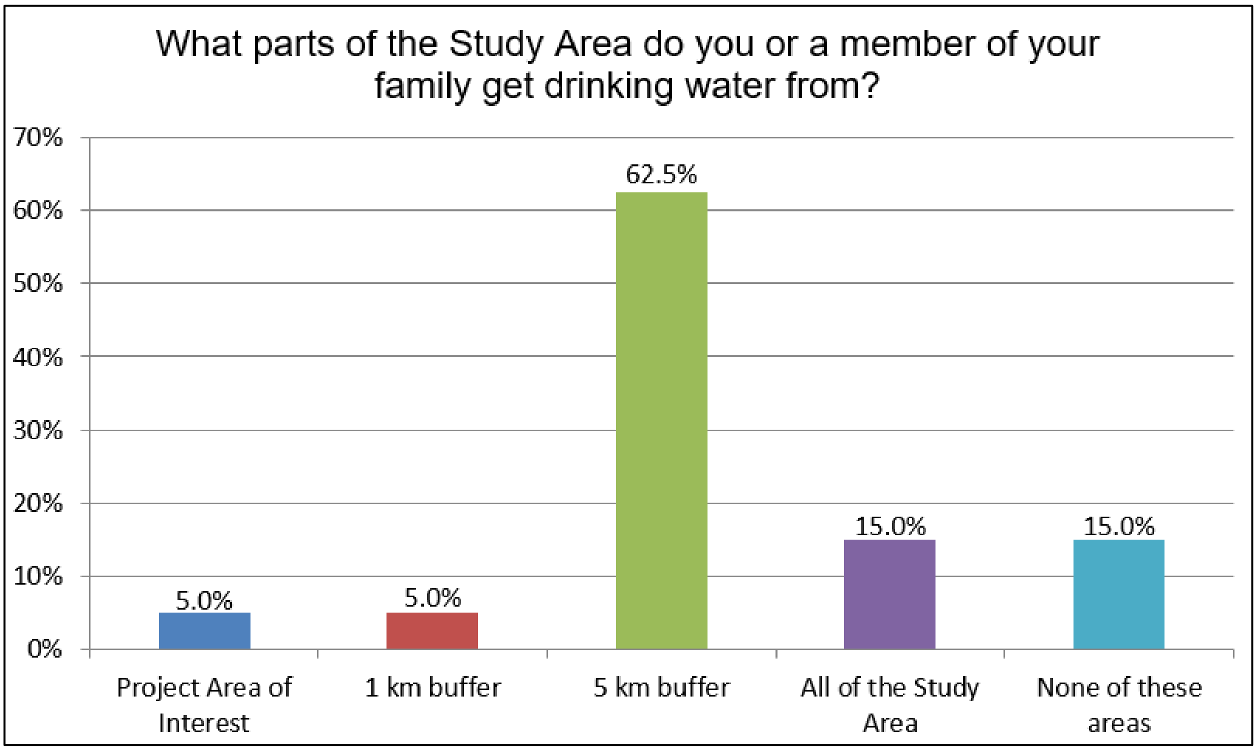


Figure 38 Drinking water source locations within the Study Area

3.2.7.2 Q37 Drinking Water Sources

The results of Q37 are presented in Figure 39. Q37 allowed participants to identify one or more sources that they, or a member of their family access drinking water from within the Study Area, as shown on Figure 2. Of the 418 participants, 35 identified water sources. Municipal supply was identified as the most common source for drinking water (57.1%, n=20), followed by natural spring (28.6%, n=10), unfiltered surface water intake (from lakes, rivers, etc.) (17.2%, n=6), filtered surface water intake (from lakes, rivers, etc.) (14.3%, n=5), and private well (2.9%, n=1).

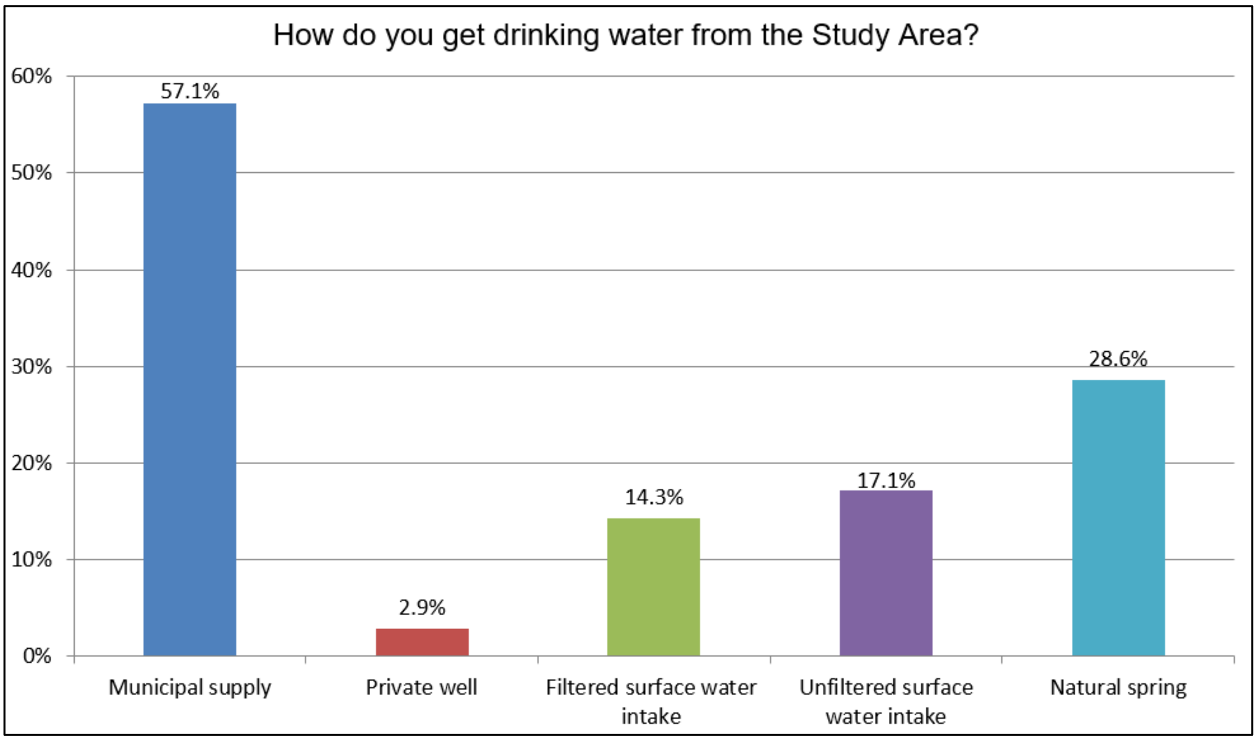


Figure 39 Drinking water sources within the Study Area

3.2.7.3 Q38 Household Water Source Locations

The results of Q38 are presented in Figure 40. Of the 418 survey participants, 40 provided a response on whether they or a family member source household water for bathing, cooking, cleaning or other household tasks from a municipal supply, private well or natural spring located within the Study Area, as shown on Figure 2. Approximately 12.5% (n=5) of participants identified that they or a family member sourced household water within all parts of the Study Area. In addition, 7.5% (n=3) of participants identified that they sourced household water within the Project's Area of Interest, 7.5% (n=3) within a 1 km buffer of the Project's Area of Interest, and 62.5% (n=25) within a 5 km buffer of the Project's Area of Interest. Approximately 12.5% (n=5) indicated they did not source household water in any of these areas.

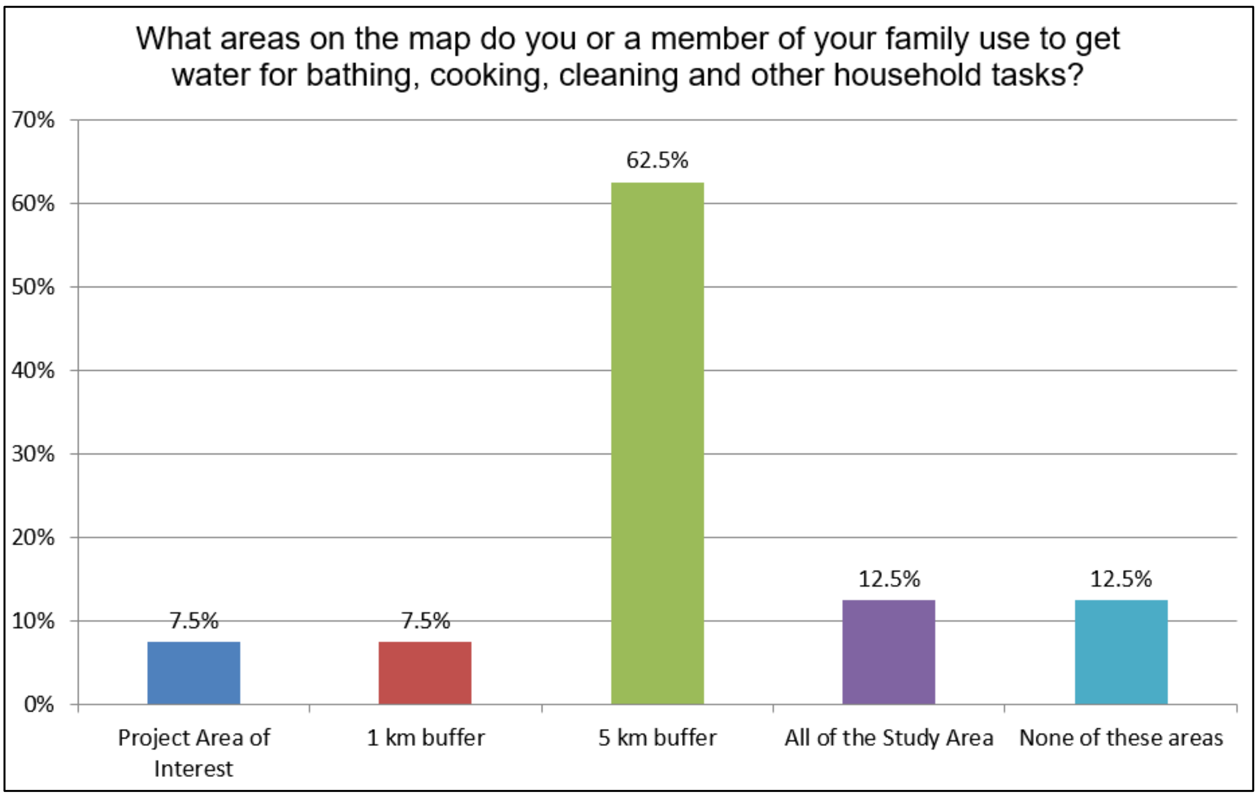


Figure 40 Household water source locations within the Study Area

3.2.7.4 Q39 Household Water Sources

The results of Q39 are presented in Figure 41. Q39 allowed participants to identify one or more sources that they, or a member of their family access household water for bathing, cooking, cleaning and other household tasks from within the Study Area, as shown on Figure 2. Of the 418 participants, 35 identified water sources. Municipal supply was identified as the most common source for drinking water (60%, n=21), followed by unfiltered surface water intake (e.g., from lakes, rivers) (22.9%, n=8), natural spring (17.1%, n=6), filtered surface water intake (e.g., from lakes, rivers) (14.3%, n=5), and private well (2.9%, n=1).

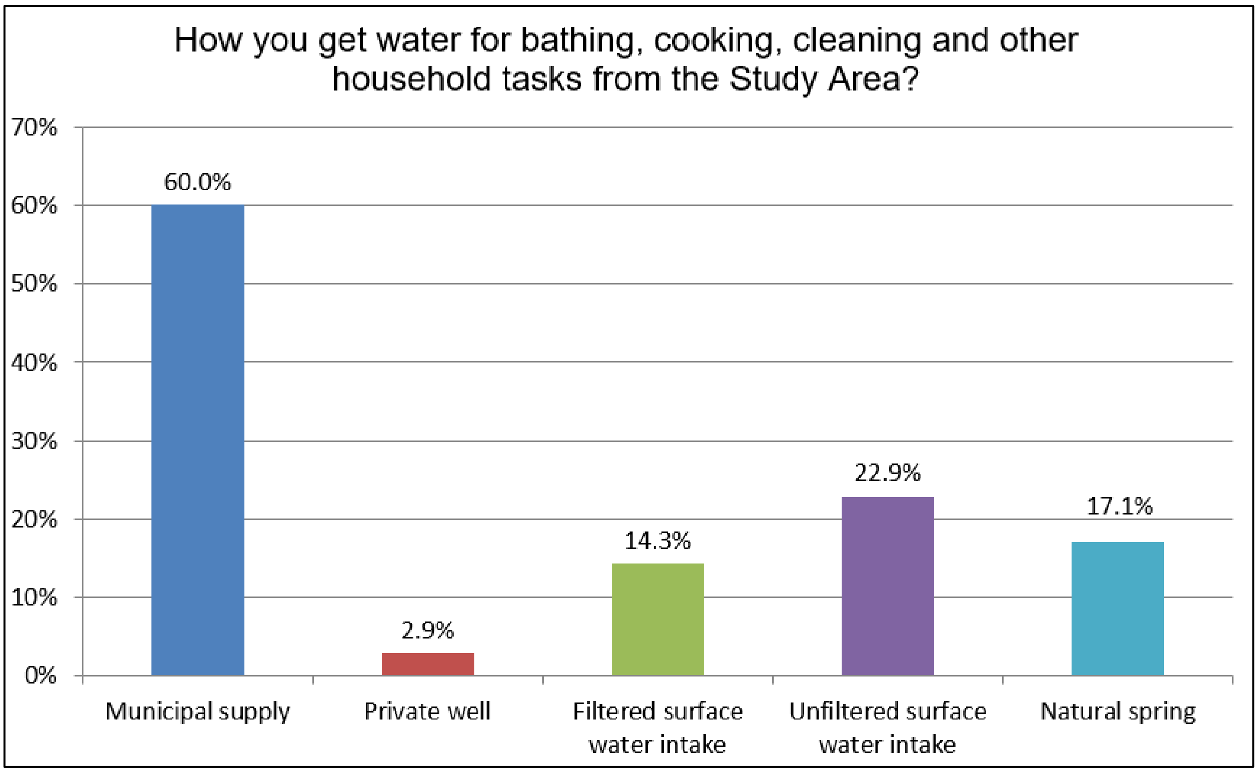


Figure 41 Household water sources within the Study Area

3.3 Community Views Questions

3.3.1 Q40 Project Engagement

The results of Q40 are presented in Figure 42. Of the 418 participants, 361 provided a response on whether they had been following updates regarding the Project or participated in FireFly's community events and open houses. Approximately 71.2% (n=257) of participants indicated they had been engaged on the Project through updates, community events and/or open houses, while 28.8% (n=104) indicated they had not been engaged.

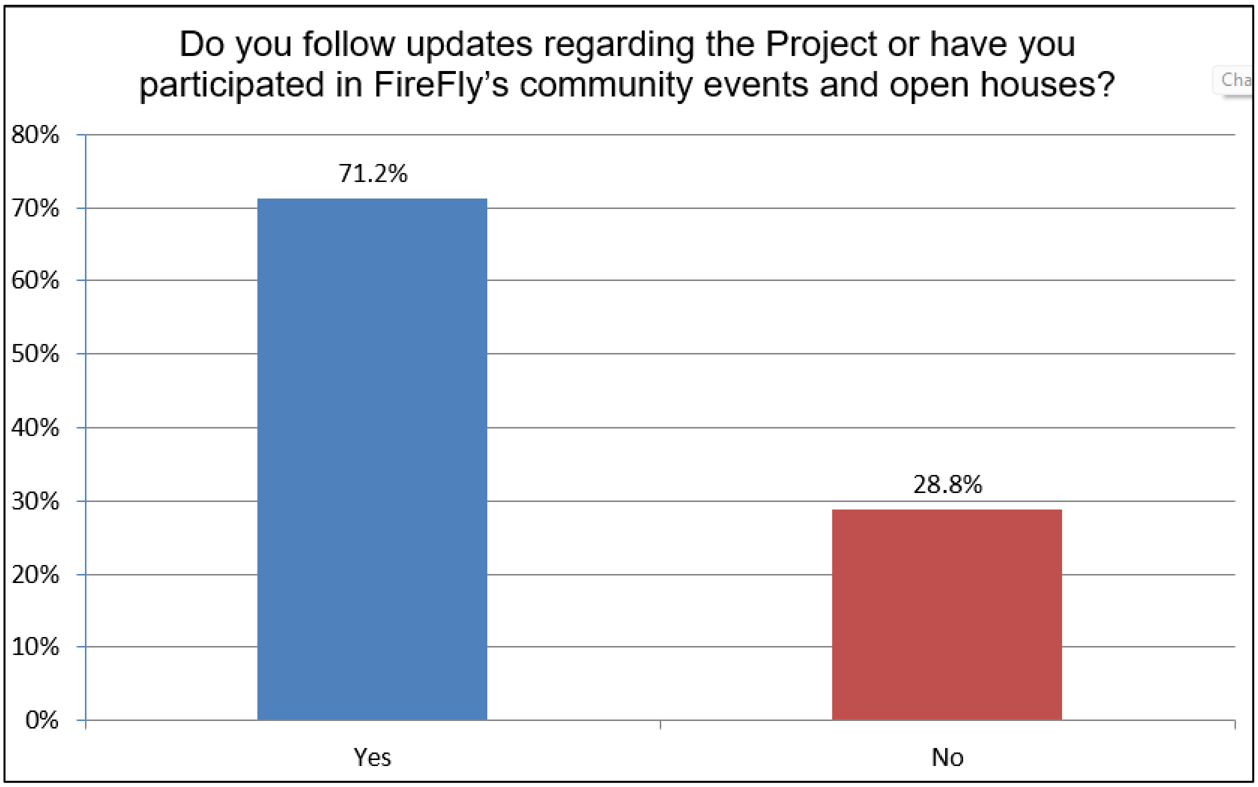


Figure 42 Project engagement

3.3.2 Q41 Project Support

The results of Q41 are presented in Figure 43. Of the 418 participants, 361 provided a response on whether they supported the proposed Green Bay Ming Mine Project. Approximately 99.5% (n=359) of participants indicated they supported the proposed Project, while 0.6% (n=2) indicated they did not.

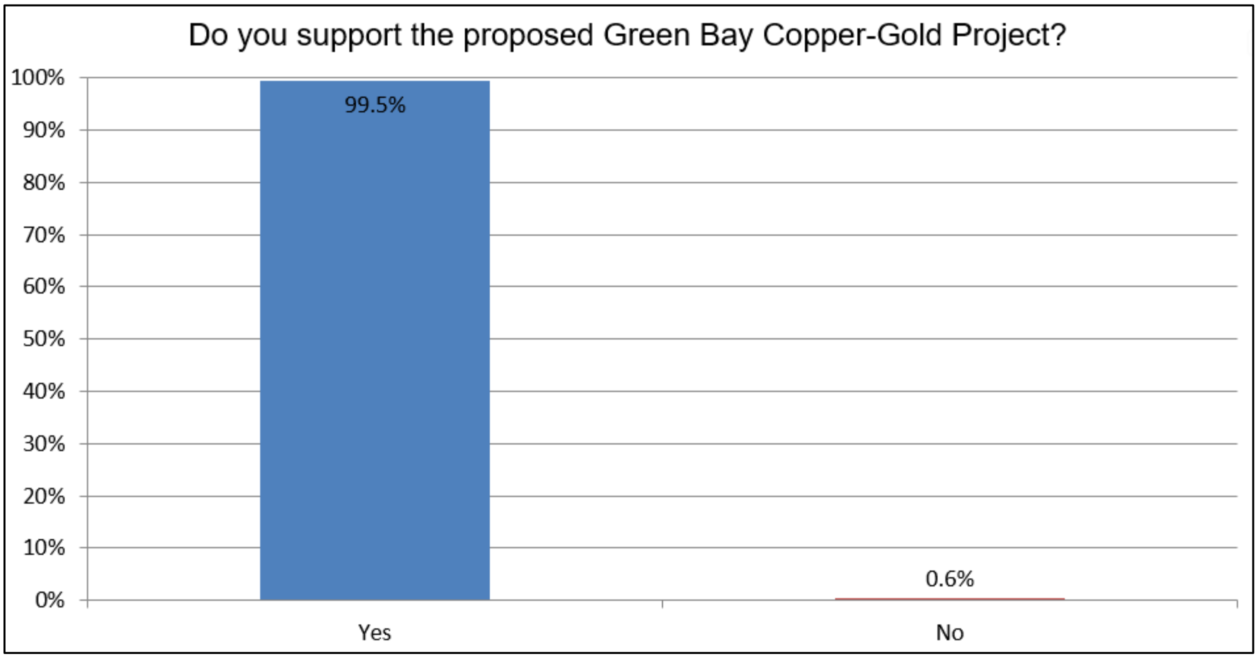


Figure 43 Project Support

3.3.3 Q42 Participant Identification of Perceived Challenges and Benefits of the Project

The results of Q42 are presented in Figure 44 and Table 1 and Table 2. Of the 418 participants who completed the survey, 57 skipped Q42 and 361 provided a response. Approximately 72.3% (n=261) indicated that they had no comment regarding the perceived challenges or benefits of the Project. Approximately 28% (n=101) provided a response to Q42.

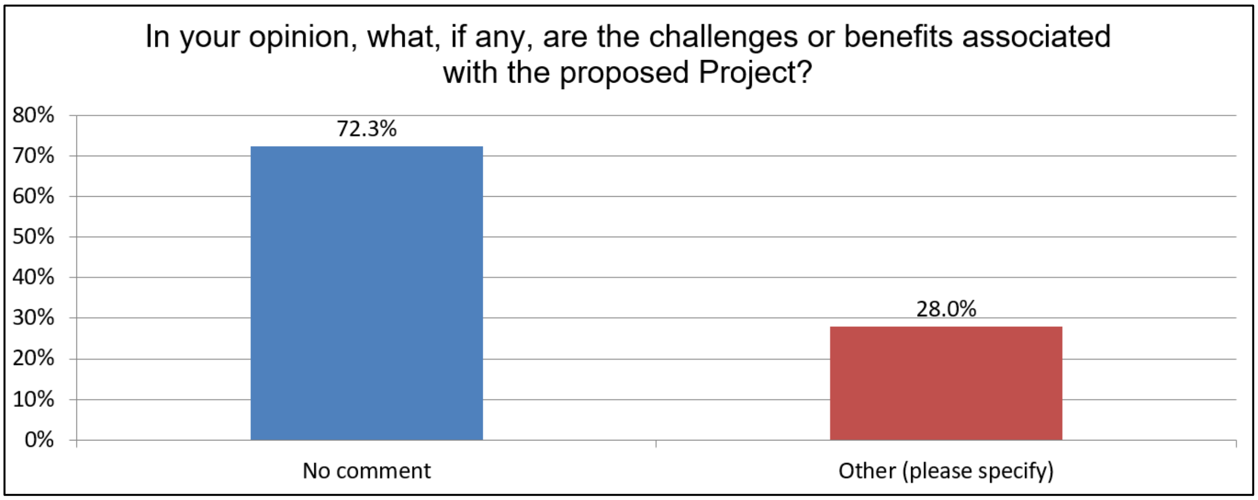


Figure 44 Participant identification of perceived risks and benefits of the Project

As shown in Figure 45, most survey participants (66.3%; n=59) identified numerous benefits associated with the Project. Perceived benefits include contributions to the local, regional, and provincial economy (n=59), followed by hopes for improved community infrastructure (n=6). Fewer participants' (23.6%; n=21) identified potential challenges of the Project; these include Project feasibility (n=5), potential environmental impacts (n=6), outsourcing a workforce (n=2), potential lack of community infrastructure for required workforce (n=1), potential loss of recreational LRU areas (n=3), potential for deteriorating road conditions and increased traffic (n=3), and past concerns related to the mine's former project management (n=6). Approximately 10.1% (n=9) of participants provided comments such as "none", or they disclosed personal information that has not been included in this report in consideration of confidentiality. Comments such as "none" are considered neutral as they discussed neither perceived challenges, nor benefits, of the Project. Figure 46 compiles a visual representation (i.e., Word Cloud) of participant feedback regarding the perceived benefits of the Project. Words that appear in larger font in Figure 46 appeared more frequently in the responses provided by the participants, whereas words that appear in smaller font were mentioned less frequently.

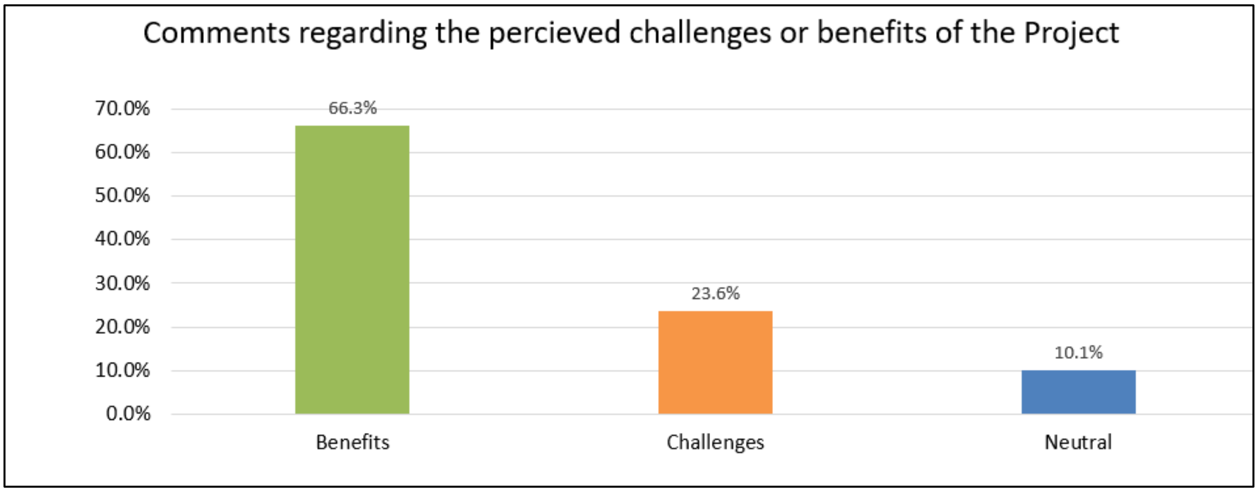


Figure 45 Overall feedback from survey participants

Figure 46 World cloud of participant feedback regarding perceived benefits of the Project

Key issues and concerns identified through engagement and participation in the LRU survey are reported in Table 1 and are organized by the Valued Components (VC) identified for the Environmental Registration document. Perceived benefits of the Project identified by the public through engagement and participation in the LRU survey are reported in Table 2 and are similarly organized by VC. Key concerns, issues, and other feedback received through the LRU survey will be recorded in the Environmental Registration document and addressed, where applicable.

The responses provided by participants who self-identified as a current employee of FireFly in Q6 (n=12) were excluded from the data presented in Figures 44 and 45 and in Tables 1 and 2 in consideration of the potential for bias.

Table 1 Perceived challenges of the Project identified by the public through engagement and participation in the LRU survey

EIS Component/VEC	Perceived Challenges
Project Description, Activities, and Processes	• Mine infrastructure and removing ore to the surface fast and effectively • Potential Project start delays due to a slow EIS process, gaining regulatory approval and “political red tape”, or due to construction financing issues • History of concerns associated with the mine’s former project management • Desire for comprehensive environmental impact assessment and post-Project clean-up • Economic feasibility for the Project to stay in production • Emphasis on health and safety over economic profit; requirements for Personal Protective Equipment for all employees and strict safety measures
Communities	• Potential need to outsource employment opportunities due to a lack of local, regional or provincial workforce • Potential lack of community infrastructure for increased workforce • Potential for deteriorating road conditions, particularly in relation to Highways 414 and 418 due to heavy truck traffic • Potential for increased traffic and travel impediments
Environmental General (Atmospheric Environment, Groundwater Resources, Surface Water Resources, Fish and Fish Habitat, Terrestrial Environment)	• Desire for the Project to be “environmentally responsible” • Concern for potential impacts to surface water and groundwater, and subsequent residual effects to vegetation and wildlife
Land and Resource Use	• Potential disruption of recreational activities, including hunting and fishing activities in the LRU Survey Study Area

Table 2 Perceived benefits of the Project identified by the public through engagement and participation in the LRU survey

EIS Component/VEC	Perceived benefits
Communities	• Improved community infrastructure, particularly roads, hospitals, and other community services • Investment in local communities • Increased tourism • Increased local, regional and provincial employment • Support for local businesses and organizations • Boost to local, regional and provincial economy • Increased provincial revenue

Appendices

Appendix A Copy of LRU Survey Administered Online

Page 1

The Green Bay Copper-Gold Project (the Project) is being proposed by FireFly Metals Canada Limited (FireFly) on the Baie Verte peninsula of the province of Newfoundland and Labrador (NL), Canada. The Project is located approximately 7 kilometers (km) southwest of the Town of Ming's Bight and 10 km east of the Town of Baie Verte. The Project is an expansion of the underground copper-gold mine, formerly known as the Rambler Ming Mine.

The Project will require an environmental assessment as part of the permitting and approval process by the provincial government, and FireFly is currently collecting information to support this process.

This survey will help us learn about the communities and land and resource use activities that occur in and around the proposed Project Area and will be used by Firefly as part of the environmental assessment.

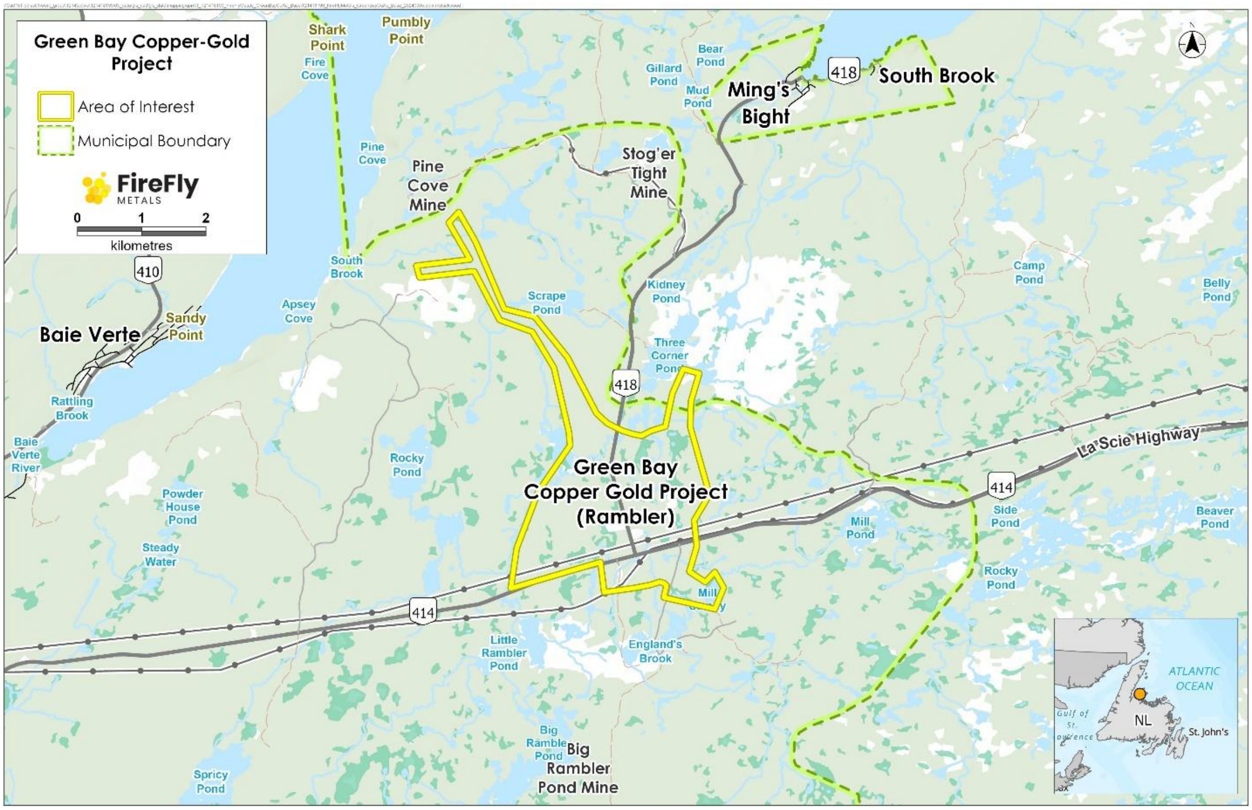
The survey does not record any contact information and your responses will remain anonymous. The survey should take approximately 7 minutes or less to complete. The survey will be open to the public from September 26th until October 25th, 2024.

Your participation in the survey is voluntary and any information you are willing to share is greatly appreciated.

To begin the survey, press the "Next" button.

Page 2

FireFly METALS



The Project is located in the area shown in yellow on the map. This area is primarily on brownfield sites with a history of mining operations. The Project will include expanding underground mine operations, development of stockpiles for waste rock and low-grade ore, the addition of an on-site primary crusher and mill processing plant, and on-site management of tailings. Concentrate generated at the site will be transported along a 6 km long access road to Pine Cove Port.

A mine life of approximately 12 to 15 years is anticipated, however further study work is required to make a formal assessment. The Project currently has 80 full-time employees, but if expanded, the Project is expected to employ an average of roughly 250 to 300 full-time equivalent (FTEs) employees during operation and could peak at approximately 650+ FTEs during construction.

FireFly is a copper and gold exploration company, with its registered office located near Ming's Bight, NL. FireFly is a wholly owned subsidiary of FireFly Metals Ltd., an Australian company publicly listed on the Australian Securities Exchange (ASX:FFM). Firefly has 100% ownership of the Project and will be the entity that will develop, manage and operate the Project.

Press the "Next" button to respond to the first set of questions.

Page 3 – Demographic Information

1. Please select one of the following options to let us know if you are:
   - ☐ A non-Indigenous resident of northwestern Newfoundland
   - ☐ A member of Qalipu First Nation
   - ☐ A member of Miawpukek First Nation
   - ☐ Prefer not to say
   - ☐ Other (Please specify): ______________

2. Which municipality or local service district do you reside in? (Select one)

   (Note: If you reside in more than one location throughout the year, please select the location associated with your permanent mailing address. If you select the "other" comment box, do not provide your address, only provide the name of the municipality or local service district. Thank you!)

   - ☐ Coachman's Cove
   - ☐ Baie Verte
   - ☐ Bear Cove
   - ☐ Brent's Cove
   - ☐ Burlington
   - ☐ Deer Lake
   - ☐ Fleur de Lys
   - ☐ Harbour Round
   - ☐ Harry's Harbour
   - ☐ King's Point
   - ☐ LaScie
   - ☐ Ming's Bight
   - ☐ Nippers Harbour
   - ☐ Pacquet
   - ☐ Round Harbour
   - ☐ Seal Cove
   - ☐ Sheppardville
   - ☐ Shoe Cove
   - ☐ Springdale
   - ☐ Tilt Cove
   - ☐ Western Arm
   - ☐ Westport
   - ☐ Wild Cove
   - ☐ Woodstock
   - ☐ Other (Please specify): _______________

3. What is your gender identity?
   - ☐ Male
   - ☐ Female
   - ☐ Non-binary
   - ☐ Prefer not to say
   - ☐ Prefer to self-describe: _____________

4. How many people reside in your household?
   - ☐ 1-2 people
   - ☐ 3-4 people
   - ☐ 5-6 people
   - ☐ 7+ people

5. Are you a former employee of Rambler Metals and Mining?
   - ☐ Yes
   - ☐ No

6. Are you a current employee of FireFly Metals Canada?
   - ☐ Yes
   - ☐ No

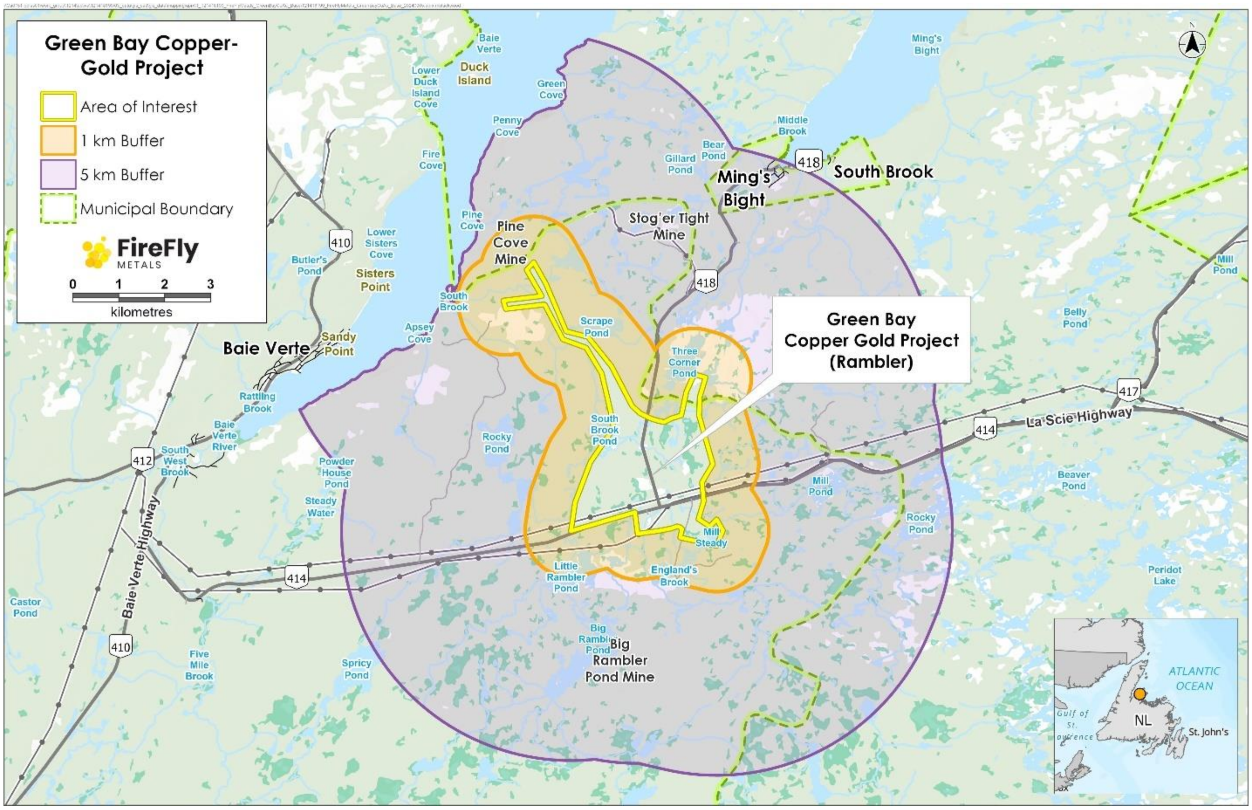
Page 4 – Resource User Group

7. Are you a member of a local resource user group (for example, the Atlantic Salmon Federation, NL Federation of Hunters and Anglers, NL Snowmobile Federation), an environmental organization (for example, CPAWS, Ducks Unlimited), or other organizations (for example, NL Outfitters Association, NL Aquaculture Industry Association)?
   - ☐ Yes*
   - ☐ No

*7a. Please list the local resource user group(s), environmental organization(s), or business organization(s) that you are a member of:

- ☐ Prefer not to say
- ☐ I am a member of the following group(s) and/or organization(s): ____

Page 5 – Land and Resource Use

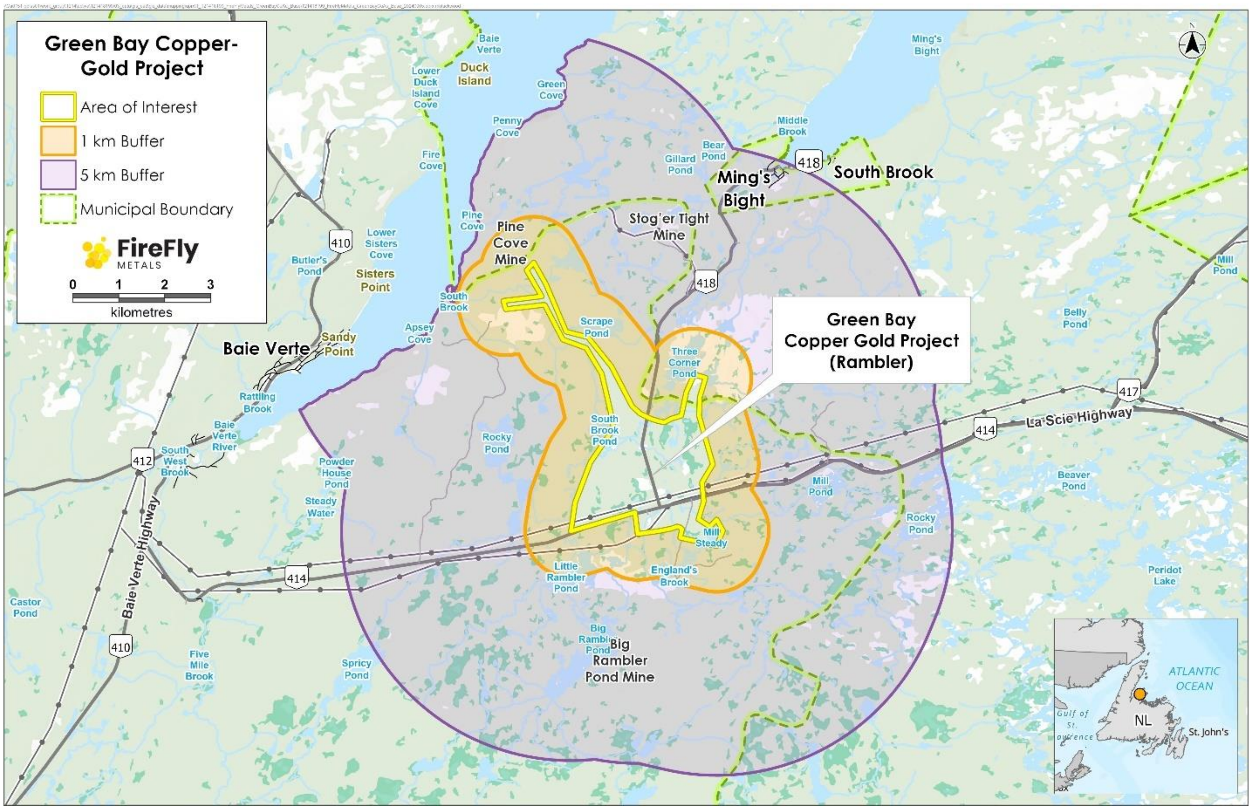


8. Land and resource use activities include things like:
   - recreational activities like hiking, snowshoeing, ATV or dirt biking, snowmobiling, swimming, canoeing
   - hunting big game like moose or trapping or hunting small game like rabbits or partridge
   - fishing
   - berry picking and other plant harvesting
   - domestic wood cutting
   - water use for bathing, cooking, cleaning or for drinking water.

   Do you engage in one or more of these land and resource use activities within the yellow, orange, and/or purple areas shown on the map?

☐ Yes
☐ No

Page 6 - Recreational Activities



9. What areas on the map (yellow, orange or purple) do you use for recreational activities (for example, hiking, snowshoeing, camping, fishing, boating, ATV or dirt biking, snowmobiling, swimming, canoeing, other)? (Select one)

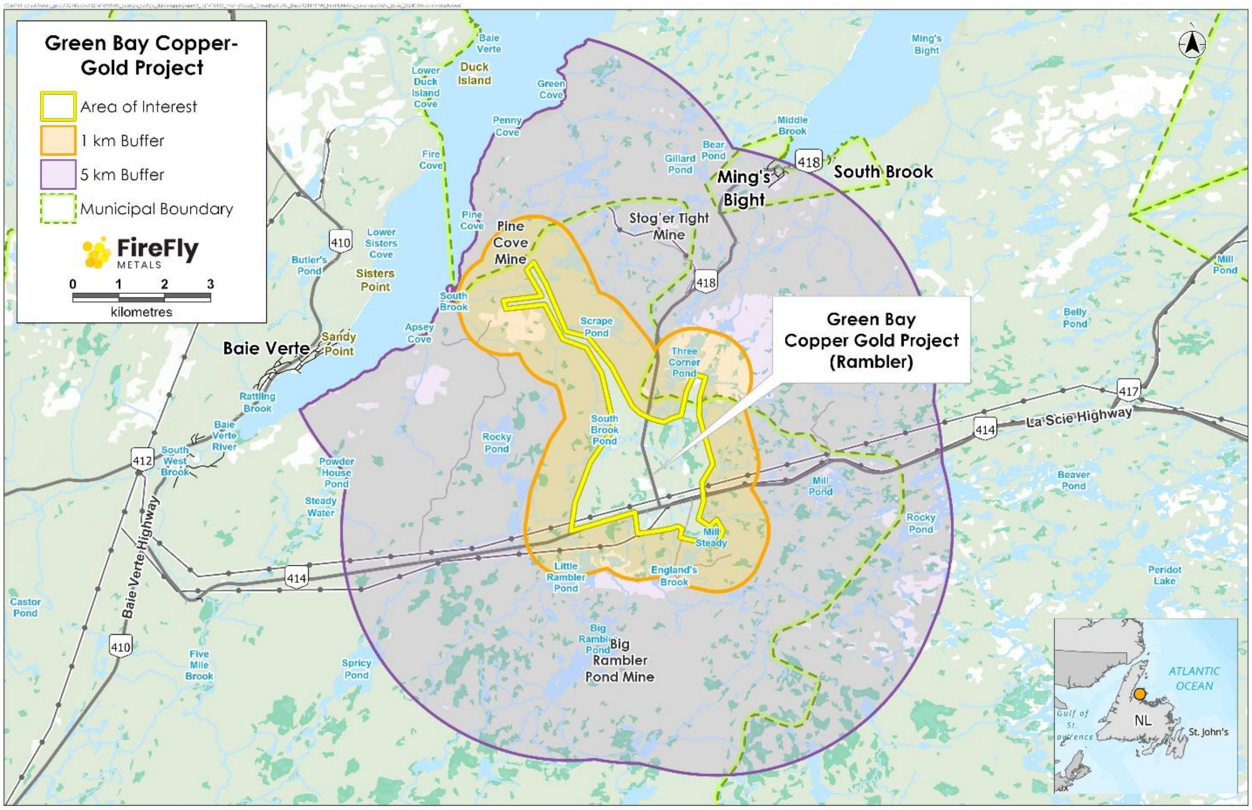
- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*9a. What types of recreational activities do you do in the areas identified on the map? (Check all that apply)

- ☐ All-terrain vehicle (ATV) or other touring (UTV, Side-by-side, etc.)
- ☐ Bird watching
- ☐ Boating (motor)
- ☐ Camping (tent, cabin, recreational vehicle [RV], etc.)
- ☐ Canoeing and/or kayaking
- ☐ Cross-country skiing
- ☐ Cycling (mountain biking; trail biking)

- ☐ Hiking / walking
- ☐ Running / jogging
- ☐ Skating
- ☐ Other (please specify): ____________________
- ☐ Snowmobiling
- ☐ Snowshoeing
- ☐ Swimming

Page 7 – Big Game Hunting



10. What areas on the map (yellow, orange or purple) do you or a member of your family use to hunt big game such as moose or bear? (Select one)

- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*10a. Do you or a member of your family hunt big game for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Recreation / Sport
- ☐ Commercial
- ☐ Traditional / Cultural
- ☐ Other (please specify): ________________

**10b. During the open season, which species of big game do you or a member of your family hunt in the colored areas shown on the map? (Check all that apply)

- ☐ Moose
- ☐ Bear
- ☐ Other (please specify): ___________________

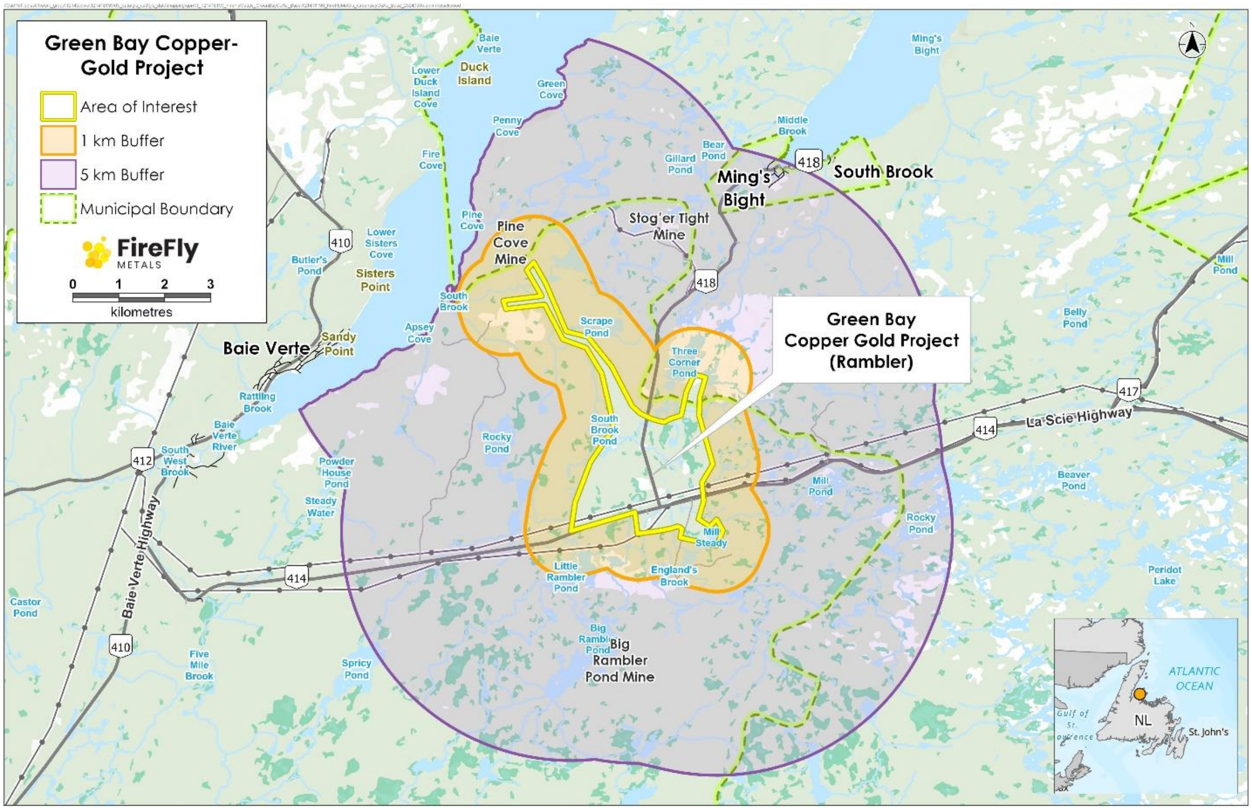
***10c. On average, how often do you or a member of your family hunt big game in the colored areas shown on the map during the open season? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

****10d. On average, how often do you eat big game that you or someone else hunted in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

Page 8 – Small Game Hunting



11. What areas on the map (yellow, orange or purple) do you or a member of your family hunt and/or trap small game (for example, rabbits, partridge, muskrat, fox) during the open season? (Select one)

- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*11a. Do you or a member of your family hunt and/or trap small game for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Recreational / Sport
- ☐ Commercial
- ☐ Traditional / Cultural
- ☐ Other (please specify): ________________

*11b. Which types of small game do you or a member of your family hunt and/or trap in the colored areas shown on the map? (Check all that apply)

- ☐ Ducks
- ☐ Fox
- ☐ Muskrat
- ☐ Partridge
- ☐ Ptarmigan / Grouse
- ☐ Rabbits
- ☐ Other (please specify): ___________________

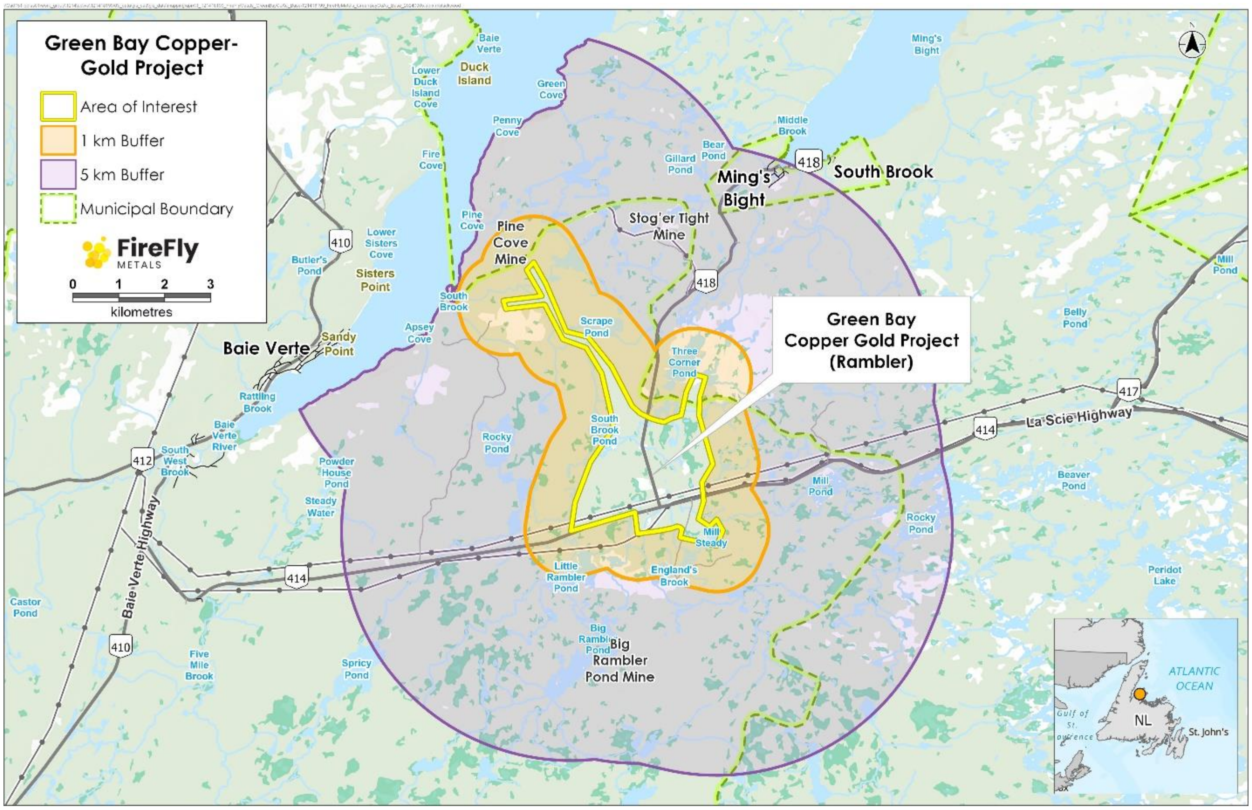
*11c. On average, how often do you or a member of your family hunt and/or trap small game in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

*11d. On average, how often do you eat small game that you or someone else hunted in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

Page 9 – Freshwater Fishing



12. What areas on the map (yellow, orange or purple) do you or a member of your family use to catch freshwater fish? (Select one)

- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*12a. Do you or a member of your family catch freshwater fish for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Recreational / Sport
- ☐ Commercial
- ☐ Traditional / Cultural
- ☐ Other (please specify): ________________

*12b. What freshwater fish do you or a member of your family catch in the colored areas shown on the map? (Check all that apply)

- ☐ American Eel
- ☐ Arctic Char
- ☐ Atlantic Salmon
- ☐ Banded Killifish
- ☐ Brown Trout
- ☐ Brook Trout
- ☐ Burbot
- ☐ Other (please specify): ________________
- ☐ Stickleback
- ☐ Lake Whitefish
- ☐ Long-nosed Dace
- ☐ Northern Pike
- ☐ Rainbow/American Smelt
- ☐ Rainbow Trout

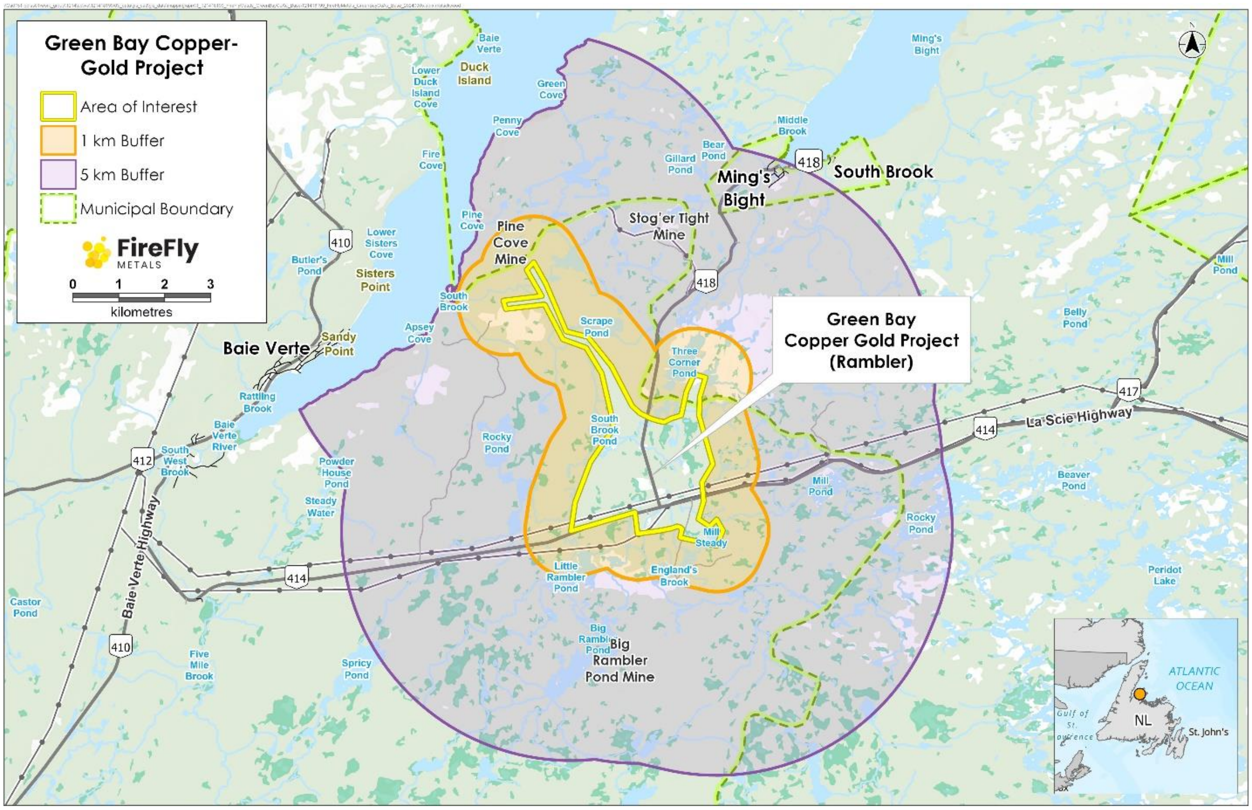
*12c. On average, how often do you or a member of your catch freshwater fish in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

*12d. On average, how often do you eat freshwater fish that you or someone else caught in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

Page 10 – Plant Gathering



13. What areas on the map (yellow, orange or purple) do you or a member of your family use to pick wild berries (for example, strawberries, blueberries, partridgeberries, blackberries) and/or harvest other wild plants (for example, mushrooms, lily pad root, cherry bark, labrador tea)?

- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*13a. Do you or a member of your family pick wild berries and/or harvest other wild plants (food/medicinal) for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Medicinal
- ☐ Recreational
- ☐ Commercial
- ☐ Traditional / Cultural

- ☐ Other (please specify): ___________________

*13b. What wild berries and/or other wild plants (food/medicinal) do you or a member of your family collect in the colored areas shown on the map? (Check all that apply)

- ☐ Bakeapples
- ☐ Blackberries
- ☐ Blueberries
- ☐ Cherry bark
- ☐ Chuckley pear / Saskatoonberry
- ☐ Ewe bush
- ☐ Fireweed
- ☐ Hazelnut
- ☐ Lily pad roots
- ☐ Other (please specify): ___________________
- ☐ Labrador tea
- ☐ Low brush juniper
- ☐ Mushrooms
- ☐ Partridge berries
- ☐ Raspberries
- ☐ Squash berries
- ☐ Wild cranberries
- ☐ Wild strawberries
- ☐ Wild garlic

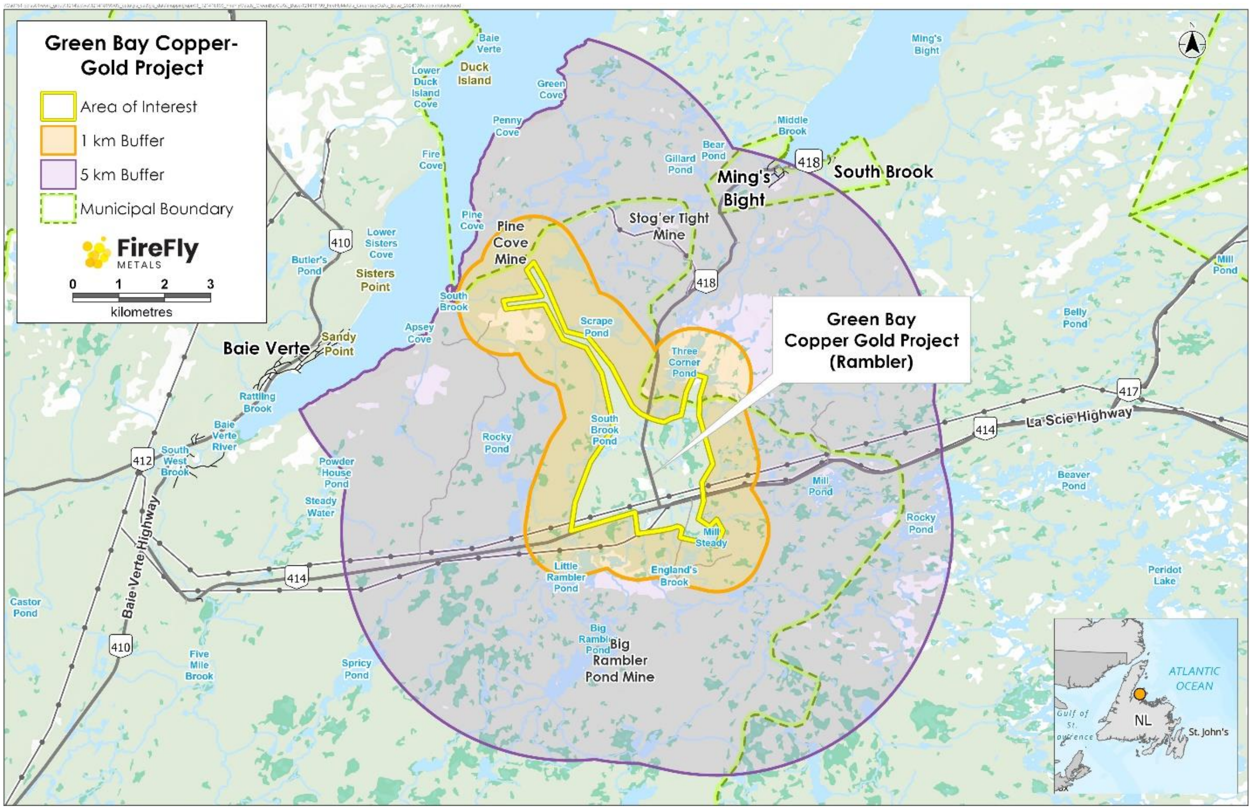
*13c. On average, how often do you or a member of your family collect wild berries and/or harvest other wild plants (food/medicinal) in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

*13d. On average, how often do you eat wild berries or other wild plants (food/medicinal) that you or someone else harvested in the colored areas shown on the map? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

Page 11 – Wood Cutting



14. What areas on the map (yellow, orange or purple) do you or a member of your family use for domestic wood cutting activities (under a provincial Domestic Wood Cutting Permit)? (Select one)
   - ☐ Yellow area
   - ☐ Orange area
   - ☐ Purple area
   - ☐ All three areas (yellow, orange and purple)
   - ☐ None of these areas

   *14a. On average, how often do you or a member of your family engage in domestic wood cutting activities (under a provincial Domestic Wood Cutting Permit) in the colored areas shown on the map? (Select one)

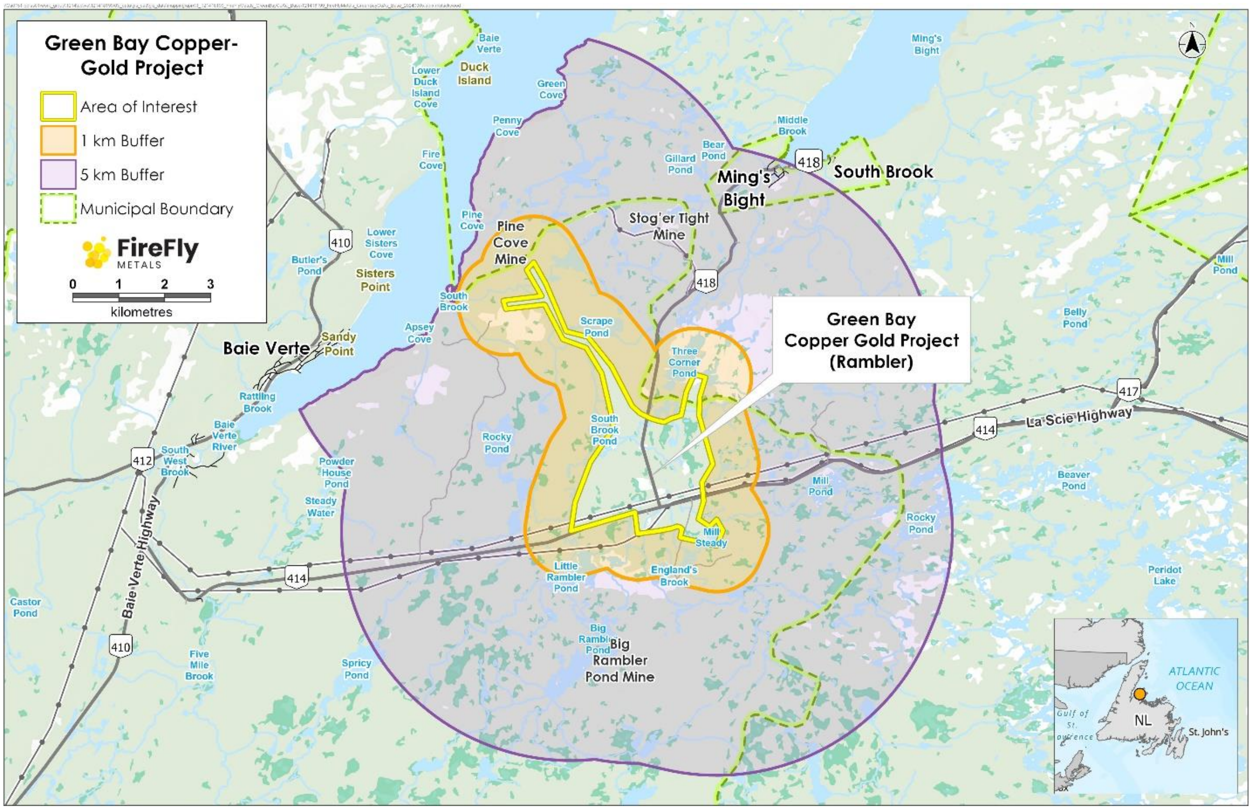
   - ☐ Daily
   - ☐ Once or twice a week
   - ☐ Once a month
   - ☐ Once every few months
   - ☐ Once a year
   - ☐ Never

- ☐ Don’t know

*14b. What are your main uses for the timber that you or a member of your family cut under the Domestic Wood Cutting Permit? (Check all that apply)

- ☐ Heating your home, cabin, shed, garage, etc.
- ☐ Cooking food
- ☐ Firewood collection (general)
- ☐ Christmas tree cutting
- ☐ Traditional/cultural activities
- ☐ Given as gift to another individual
- ☐ Domestic construction/home construction (includes fences, other structures, such as cabins, lean-to’s, etc.)
- ☐ Making utensils
- ☐ Artisanal (producing furniture, art, toys, instruments, etc.)
- ☐ Other (please specify): ____________________________

Page 12 – Water Use



15. What areas on the map (yellow, orange or purple) do you or a member of your family get drinking water from? (for example, from a municipal supply, private well, or natural spring in these areas) (Select one)
    - ☐ Yellow area
    - ☐ Orange area
    - ☐ Purple area
    - ☐ All three areas (yellow, orange and purple)
    - ☐ None of these areas

    *15a. How do you get drinking water from the colored areas shown on the map? (Select all that apply)

    - ☐ Municipal supply
    - ☐ Private well
    - ☐ Filtered surface water intake (from lakes, rivers, etc.)
    - ☐ Unfiltered surface water intake (from lakes, rivers, etc.)
    - ☐ Natural spring
    - ☐ Other (Please specify): ________________

*16. What areas on the map (yellow, orange or purple) do you or a member of your family use to get water for bathing, cooking, cleaning and other household tasks? (for example, from a municipal supply, private well, or natural spring in these areas) (Select one)

- ☐ Yellow area
- ☐ Orange area
- ☐ Purple area
- ☐ All three areas (yellow, orange and purple)
- ☐ None of these areas

*16a. How you get water for bathing, cooking, cleaning and other household tasks from the colored areas shown on the map? (Select all that apply)

- ☐ Municipal supply
- ☐ Private well
- ☐ Filtered surface water intake (from lakes, rivers, etc.)
- ☐ Unfiltered surface water intake (from lakes, rivers, etc.)
- ☐ Natural spring
- ☐ Other (Please specify): ________________

Page 13 – Participant Views Questions

17. Do you follow updates regarding the Project or have you participated in FireFly's community events and open houses?
    - ☐ Yes
    - ☐ No

18. Do you support the proposed Green Bay Copper-Gold Project?
    - ☐ Yes
    - ☐ No

19. In your opinion, what, if any, are the challenges or benefits associated with the proposed Project?
    - ☐ No comment
    - ☐ (please specify):

    ____

Page 14 – End of Survey

Thank you for your participation in this survey!

For any enquiries, or to receive newsletters or communications from FireFly please email us at comments@fireflymetals.ca or call us at 709-800-1929.

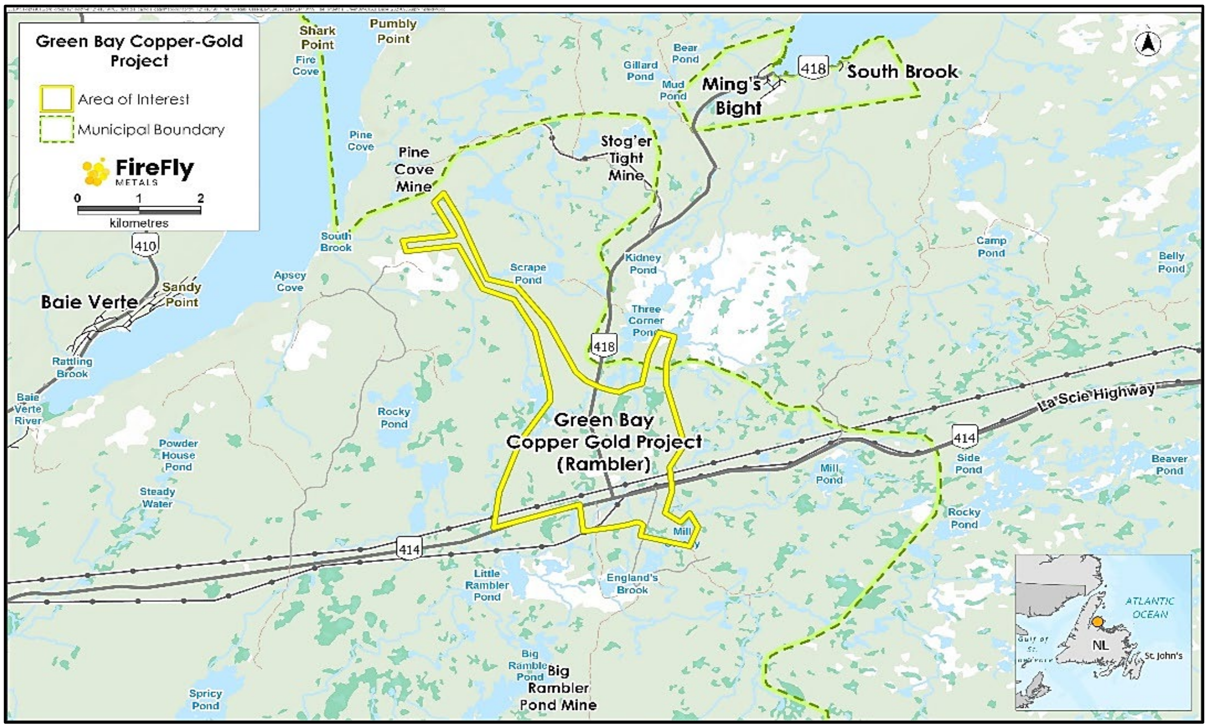
FireFly has an active Facebook page providing regular updates about the Project, you can find us by searching for the profile “FireFly Newfoundland” (https://www.facebook.com/profile.php?id=61553713276590).

Project updates are also provided on our website at www.fireflymetals.ca or we can be followed social media pages like LinkedIn at https://www.linkedin.com/company/fireflymetals/ and X (formerly Twitter) at https://x.com/FireFly_Metals.

Appendix B Copy of LRU Survey (Printed Version)

Green Bay Copper-Gold Project

Land and Resource Use Survey



The Green Bay Copper-Gold Project (the Project) is being proposed by FireFly Metals Canada Limited (FireFly) in the yellow area shown on the map above. It will be located on the Baie Verte peninsula of the province of Newfoundland and Labrador (NL), Canada.

The Project will require an environmental assessment as part of the permitting and approval process by the provincial government, and FireFly is currently collecting information to support this process.

This survey will help us learn about the communities and land and resource use activities that occur in and around the proposed Project Area and will be used by Firefly as part of the environmental assessment.

The survey does not ask you to provide any contact information and your responses will remain anonymous.

Please return this survey to our Firefly Metals Information Booth before you leave today. This survey can also be handed in at our Security Of¸ ce (former Rambler/Ming Mine), Route #418, Mingés Bight Road, on or before 6:00 p.m. on Friday October 11, 2024.

Community Questions

The ¿rst set of questions will help us learn more about our neighboring communities.

1. Please select one of the following options to let us know if you are:
   - ☐ A non-Indigenous resident of northwestern Newfoundland
   - ☐ A member of Qalipu First Nation
   - ☐ A member of Miawpukek First Nation
   - ☐ Prefer not to say
   - ☐ Other (Please specify):

   ____

2. Which municipality or local service district do you reside in?

   ____

3. What is your gender identity?
   - ☐ Male
   - ☐ Female
   - ☐ Non-binary
   - ☐ Prefer not to say
   - ☐ Prefer to self-describe: __________________________

4. How many people reside in your household?
   - ☐ 1-2 people
   - ☐ 3-4 people
   - ☐ 5-6 people
   - ☐ 7+ people

5. Are you a former employee of Rambler Metals and Mining?
   - ☐ Yes
   - ☐ No

6. Are you a current employee of FireFly Metals Canada?
   - ☐ Yes
   - ☐ No

FireFly METALS

Community Questions

7. Are you a member of a local resource user group (for example, the Atlantic Salmon Federation, NL Federation of Hunters and Anglers, NL Snowmobile Federation), an environmental organization (for example, CPAWS, Ducks Unlimited), or other organizations (for example, NL Out¸ tters Association, NL Aquaculture Industry Association)?

☐ Yes (Please answer Question 8)
☐ No (Skip to Question 9 on Page 4)

8. Please list the local resource user group(s), environmental organization(s), or business organization(s) that you are a member of:

☐ Prefer not to say
☐ I am a member of the following group(s) and/or organization(s):

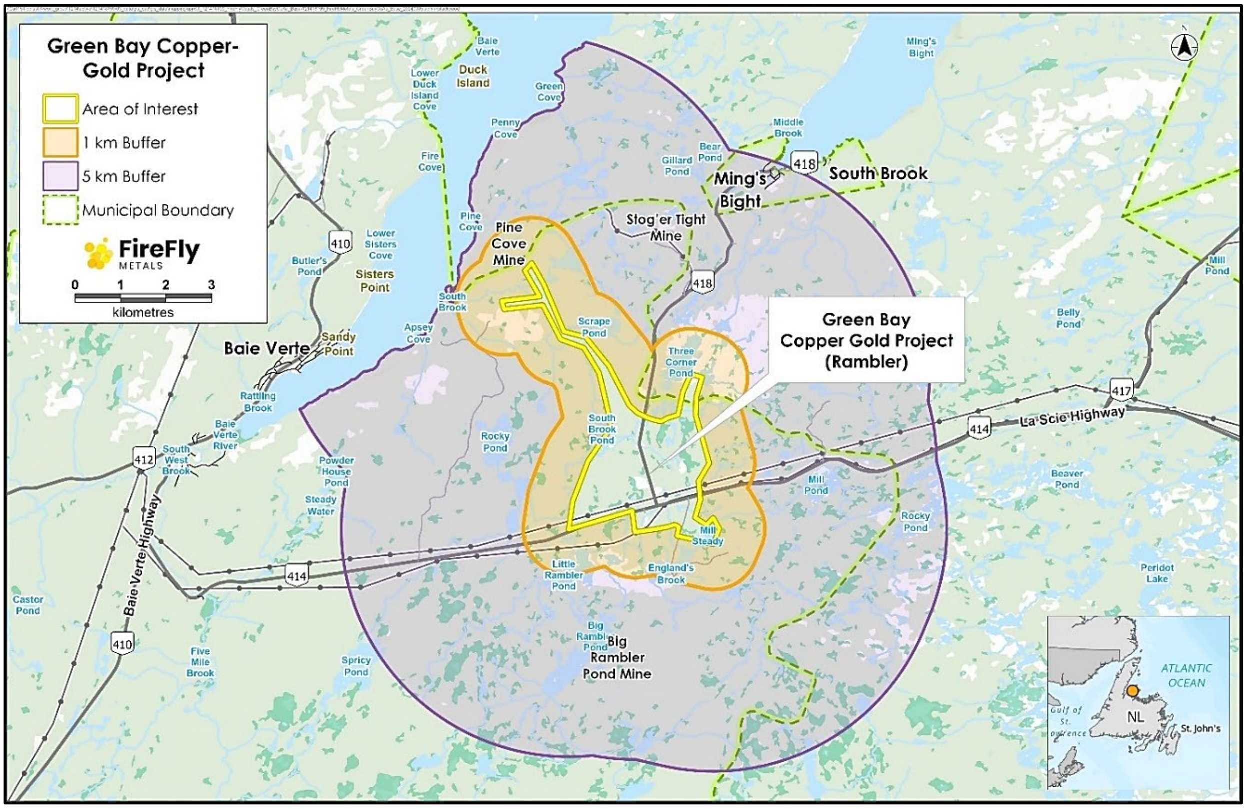
____

____

____

Land and Resource Use Questions

The next set of questions ask about land and resource use activities.



9. Land and resource use activities include things like:
- recreational activities like hiking, snowshoeing, ATV or dirt biking, snowmobiling, swimming, canoeing
- hunting big game like moose or trapping or hunting small game like rabbits or partridge
- ˛ shing
- berry picking and other plant harvesting
- domestic wood cutting
- water use for bathing, cooking, cleaning or for drinking water.

Do you engage in one or more of these land and resource use activities within the yellow, orange, and/or purple areas shown on the map above?

☐ Yes (Please answer Question 10 on Page 5)
☐ No (Skip to Question 39 on Page 13)

FireFly METALS

Land and Resource Use Questions

10. Referring to the map on Page 4, what areas (yellow, orange or purple) do you use for recreational activities (for example, hiking, snowshoeing, camping, fishing, boating, ATV or dirt biking, snowmobiling, swimming, canoeing, other)? (Check all that apply)

- ☐ Yellow area (Please answer Question 11)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 12)

11. What types of recreational activities do you do in the areas identified on the map on Page 4? (Check all that apply)

- ☐ All-terrain vehicle (ATV) or other touring (UTV, Side-by-side, etc.)
- ☐ Bird watching
- ☐ Boating (motor)
- ☐ Camping (tent, cabin, recreational vehicle [RV], etc.)
- ☐ Canoeing and/or kayaking
- ☐ Cross-country skiing
- ☐ Other (please specify):

____

- ☐ Cycling (mountain biking; trail biking)
- ☐ Hiking / walking
- ☐ Running / jogging
- ☐ Skating
- ☐ Snowmobiling
- ☐ Snowshoeing
- ☐ Swimming

12. What areas of the map on Page 4 (yellow, orange or purple) do you or a member of your family use to hunt big game such as moose or bear? (Check all that apply)

- ☐ Yellow area (Please answer Questions 13 to 16 on Page 6)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 17 on Page 7)

Land and Resource Use Questions

13. Do you or a member of your family hunt big game for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Recreation / Sport
- ☐ Commercial
- ☐ Traditional / Cultural
- ☐ Other (please specify): ________________________________

14. During the open season, which species of big game do you or a member of your family hunt in the colored areas shown on the map on Page 4? (Check all that apply)

- ☐ Moose
- ☐ Bear
- ☐ Other (please specify): ________________________________

15. On average, how often do you or a member of your family hunt big game in the colored areas shown on the map during the open season? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Donť know

16. On average, how often do you eat big game that you or someone else hunted in the colored areas shown on the map on Page 4? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Donť know

FireFly METALS

Land and Resource Use Questions

17. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family hunt and/or trap small game (for example, rabbits, partridge, muskrat, fox) during the open season? (Check all that apply)

- ☐ Yellow area (Please answer Questions 18 to 21)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 22 on Page 8)

18. Do you or a member of your family hunt and/or trap small game for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Commercial
- ☐ Recreational / Sport
- ☐ Traditional / Cultural
- ☐ Other (please specify): ___________________________________

19. Which types of small game do you or a member of your family hunt and/or trap in the colored areas shown on the map on Page 4? (Check all that apply)

- ☐ Ducks
- ☐ Partridge
- ☐ Fox
- ☐ Ptarmigan / Grouse
- ☐ Muskrat
- ☐ Rabbits
- ☐ Other (please specify): ___________________________________

20. On average, how often do you or a member of your family hunt and/or trap small game in the colored areas shown on the map on Page 4? (Select one)

- ☐ Daily
- ☐ Once a year
- ☐ Once or twice a week
- ☐ Never
- ☐ Once a month
- ☐ Donȇt know
- ☐ Once every few months

Land and Resource Use Questions

21. On average, how often do you eat small game that you or someone else hunted in the colored areas shown on the map on Page 4? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Don't know

22. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family use to catch freshwater fish? (Check all that apply)

- ☐ Yellow area (Please answer Questions 23 to 26)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 27 on Page 9)

23. Do you or a member of your family catch freshwater fish for one or more of the following purposes? (Check all that apply)

- ☐ Food
- ☐ Recreational / Sport
- ☐ Commercial
- ☐ Traditional / Cultural
- ☐ Other (please specify): ______________________________

24. What freshwater fish do you or a member of your family catch in the colored areas shown on the map? (Check all that apply)

- ☐ American Eel
- ☐ Arctic Char
- ☐ Atlantic Salmon
- ☐ Banded Killifish
- ☐ Brown Trout
- ☐ Brook Trout
- ☐ Burbot
- ☐ Stickleback
- ☐ Lake Whitefish
- ☐ Long-nosed Dace
- ☐ Northern Pike
- ☐ Rainbow/American Smelt
- ☐ Rainbow Trout
- ☐ Other (please specify): ______________________________

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Land and Resource Use Questions

25. On average, how often do you or a member of your catch freshwater fish in the colored areas shown on the map on Page 4? (Select one)

☐ Daily
☐ Once or twice a week
☐ Once a month
☐ Once every few months
☐ Once a year
☐ Never
☐ Don't know

26. On average, how often do you eat freshwater fish that you or someone else caught in the colored areas shown on the map on Page 4? (Select one)

☐ Daily
☐ Once or twice a week
☐ Once a month
☐ Once every few months
☐ Once a year
☐ Never
☐ Don't know

27. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family use to pick wild berries (for example, strawberries, blueberries, partridgeberries, blackberries) and/or harvest other wild plants (for example, mushrooms, lily pad root, cherry bark, labrador tea)? (Check all that apply)

☐ Yellow area (Please answer questions 28 to 31)
☐ Orange area (Same as above)
☐ Purple area (Same as above)
☐ None of these areas (Skip to Question 32 on Page 11)

28. Do you or a member of your family pick wild berries and/or harvest other wild plants (food/medicinal) for one or more of the following purposes? (Check all that apply)

☐ Food
☐ Medicinal
☐ Recreational
☐ Other (please specify): ____
☐ Commercial
☐ Traditional / Cultural

Land and Resource Use Questions

29. What wild berries and/or other wild plants (food/medicinal) do you or a member of your family collect in the colored areas shown on the map on Page 4? (Check all that apply)

☐ Bakeapples
☐ Blackberries
☐ Blueberries
☐ Cherry bark
☐ Chuckley pear / Saskatoonberry
☐ Ewe bush
☐ Fireweed
☐ Hazelnut
☐ Lily pad roots
☐ Labrador tea
☐ Low brush juniper
☐ Mushrooms
☐ Partridge berries
☐ Raspberries
☐ Squash berries
☐ Wild cranberries
☐ Wild strawberries
☐ Wild garlic
☐ Other (please specify): ____

30. On average, how often do you or a member of your family collect wild berries and/or harvest other wild plants (food/medicinal) in the colored areas shown on the map on Page 4? (Select one)

☐ Daily
☐ Once or twice a week
☐ Once a month
☐ Once every few months
☐ Once a year
☐ Never
☐ Don't know

31. On average, how often do you eat wild berries or other wild plants (food/medicinal) that you or someone else harvested in the colored areas shown on the map on Page 4? (Select one)

☐ Daily
☐ Once or twice a week
☐ Once a month
☐ Once every few months
☐ Once a year
☐ Never
☐ Don't know

Land and Resource Use Questions

32. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family use for domestic wood cutting activities (under a provincial Domestic Wood Cutting Permit)? (Check all that apply)

- ☐ Yellow area (Please answer Questions 33 to 34)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 35 on Page 12)

33. On average, how often do you or a member of your family engage in domestic wood cutting activities (under a provincial Domestic Wood Cutting Permit) in the colored areas shown on the map on Page 4? (Select one)

- ☐ Daily
- ☐ Once or twice a week
- ☐ Once a month
- ☐ Once every few months
- ☐ Once a year
- ☐ Never
- ☐ Doné know

34. What are your main uses for the timber that you or a member of your family cut under the Domestic Wood Cutting Permit? (Check all that apply)

- ☐ Heating your home, cabin, shed, garage, etc.
- ☐ Cooking food
- ☐ Firewood collection (general)
- ☐ Christmas tree cutting
- ☐ Traditional/cultural activities
- ☐ Given as gift to another individual
- ☐ Domestic construction/home construction (such as fences, cabins)
- ☐ Making utensils
- ☐ Artisanal (producing furniture, art, toys, instruments, etc.)
- ☐ Other (please specify): ____

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Land and Resource Use Questions

35. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family get drinking water from? (for example, from a municipal supply, private well, or natural spring in these areas) (Check all that apply)

- ☐ Yellow area (Please answer Question 36)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 37)

36. How do you get drinking water from the colored areas shown on the map on Page 4? (Select all that apply)

- ☐ Municipal supply
- ☐ Private well
- ☐ Filtered surface water intake (from lakes, rivers, etc.)
- ☐ Unfiltered surface water intake (from lakes, rivers, etc.)
- ☐ Natural spring
- ☐ Other (Please specify): ___________________________________

37. Referring to the map on Page 4, what areas (yellow, orange or purple) do you or a member of your family use to get water for bathing, cooking, cleaning and other household tasks? (for example, from a municipal supply, private well, or natural spring in these areas) (Check all that apply)

- ☐ Yellow area (Please answer Question 38 on Page 13)
- ☐ Orange area (Same as above)
- ☐ Purple area (Same as above)
- ☐ None of these areas (Skip to Question 39 on Page 13)

Land and Resource Use Questions

38. How you get water for bathing, cooking, cleaning and other household tasks from the colored areas shown on the map? (Check all that apply)

- ☐ Municipal supply
- ☐ Private well
- ☐ Filtered surface water intake (from lakes, rivers, etc.)
- ☐ Unfiltered surface water intake (from lakes, rivers, etc.)
- ☐ Natural spring
- ☐ Other (Please specify): ____________________

Community Views Questions

39. Do you follow updates regarding the Project, or have you participated in FireFly's community events and open houses?

- ☐ Yes
- ☐ No

40. Do you support the proposed Green Bay Copper-Gold Project?

- ☐ Yes
- ☐ No

41. In your opinion, what, if any, are the challenges or benefits associated with the proposed Project?

- ☐ No comment
- ☐ Please Specify:

Thank you for your participation in this survey!

For any enquiries, or to receive newsletters or communications from FireFly please email us at comments@fireflymetals.ca or call us at 709-800-1929.

FireFly has an active Facebook Page providing regular updates about the Project, you can find us by searching for the profile “FireFly Newfoundland” (https://www.facebook.com/profile.php?id=61553713276590).

Project updates are also provided on our website at www.fireflymetals.ca or we can be followed on social media pages like LinkedIn at https://www.linkedin.com/company/fireflymetals/ and X (formerly Twitter) at https://x.com/FireFly_Metals.

Please return this survey to our Firefly Metals Information Booth before you leave today.

This survey can also be handed in at our Security Office (former Rambler/Ming Mine) Route #418, Ming’s Bight Road, on or before 6:00 p.m. on Friday October 11, 2024

Appendix C Engagement Materials

Land and Resource Use Survey

What is it you ask? Well, it is a valuable tool to help us understand what and where people like to gather plants, hunt, enjoy the outdoors (e.g. snowmobiling, hiking) and do various other activities. No, it is not a way to know your favourite hunting or blueberry picking location (that is your secret!), instead, it will help us plan the mine design. For instance, we may need to build roads, clear areas for buildings and set up piping for fresh-water intake, and if we can, we want to avoid areas important to local communities and residents. Sometimes they can't be avoided, and we will work with you to understand how to mitigate and reduce those potential effects of the Project

The survey encompasses questions not only about recreation and land use but also seeks input on the Project itself. We kindly ask you to complete the survey and share this with your family, and friends, as we value your support. If you have any inquiries, please feel free to reach out to us at comments@fireflymetals.ca

You can access the survey through the QR code or via this link:

https://www.surveymonkey.com/r/GreenBayCopperGoldProject

or

THANK YOU for YOUR SUPPORT!

FireFly
METALS

ONLINE SURVEY

We need to hear from you! Please use the QR code above or this website to complete the survey.
https://www.surveymonkey.com/r/GreenBayCopperGoldProject

Contact us at comments@fireflymetals.ca if you have questions

FireFly
METALS

ONLINE SURVEY

We need to hear from you! Please use the QR code above or this website to complete the survey.
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FireFly
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ONLINE SURVEY

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FireFly
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ONLINE SURVEY

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FireFly
METALS

ONLINE SURVEY

We need to hear from you! Please use the QR code above or this website to complete the survey.
https://www.surveymonkey.com/r/GreenBayCopperGoldProject

Contact us at comments@fireflymetals.ca if you have questions

FireFly
METALS

ONLINE SURVEY

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FireFly METALS

September 2024 Quarterly Newsletter

Quarterly Insight into the Green Bay Copper-Gold Project

Project News | Community Connections | Boots on the Ground | Health, Safety & Environment | Three Month Outlook

Community Connections

In efforts to show appreciation to all employees who continually work safely, there was a weekly barbeque for all employees and contractors on site to highlight the winning of the 2022 National John T. Ryan Safety Award. There was a good time had by all, with the focus on carrying this safety culture into the next phase of the project. Thanks to all for their support!!

For more information, go to www.fireflymetals.com.au

Project News

Thinking about a Future Career? Look No Further and Stay Close to Home!

With forecasts of increased activity and growth, we will continue to hire skilled capable individuals to fill positions that become available. There are many career paths to take in mining, some of which are **shift supervisor, jumbo operator, bolter operator, scoop operator, truck driver, blaster, HEO, electrician, millwright, welder, mechanic, flotation operator, grinding operator, dewatering & sampling, Lab/analytical, metallurgist, crusher operator, office administration, finance, human resources, engineer & environmental.**

At FireFly Metals, we are committed to fostering a culture designed to strengthen career opportunities for a diverse workforce. As our company continues to grow, we commit to increasing our diversity as much as possible. We have policies in place to promote morale fairness and pride ourselves in providing a working environment that is free from harassment and discrimination (regardless of an individual's culture, race, religion, age, gender, sexual orientation, disability etc.).

Firefly Metals explores every opportunity to promote gender and cultural diversity/equality in the workplace. One of the many areas we focus on is women in the workplace and areas where women have typically been under-represented.

With an appreciation for gender differences and gender diversity, we recognize that having strong female leaders brings new perspectives to business challenges, which in turn creates new approaches and solutions to those challenges.

Contact us:
comments@fireflymetals.ca

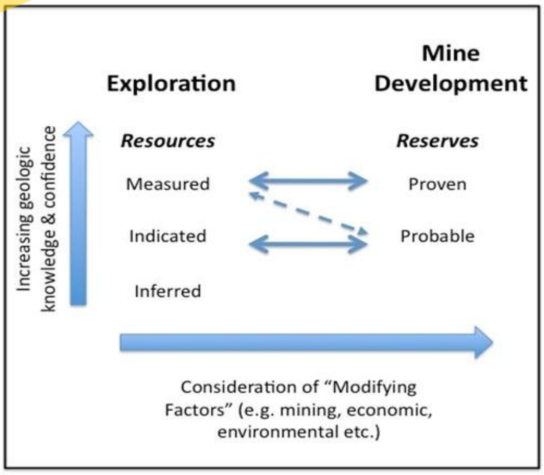
Boots on the Ground

New additions to site. Not only is our fleet growing but so is our Team!

Expansion Project

As you may have heard, we've been busy looking at options to expand our operation at the mill site, including the possible construction of a larger mill and tailings management facility. The mine is currently on care and maintenance. One of the many challenges was the Nugget Pond mill was too small and the trucking distances too far to make it sustainable.

We're currently drilling to increase the resource, the first step needed to build a larger long-term operation. What is a resource? According to the Canadian Institute of Mining (CIM), a Mineral Resource is the *"concentration or occurrence of solid material of economic interest in the earth's crust in form, grade, quality and quality that there are reasonable prospects for eventual extraction" (CIM, 2014).* A Mineral Resource can be subdivided into different groups depending on geological



knowledge and confidence. These groups are Inferred, Indicated and Measured. With additional exploration drilling, you can increase confidence of the copper and gold in the ground. The lower level of confidence is inferred and the highest is measured (see image above). Qualified people, with training, education and years of experience determine what "confidence categories" are applied.

We are expanding the resources at the mine through FireFly's exploration program and building confidence in the mineralization. It can take many years to move from Inferred to Measured and, with further study work, to potentially become an Ore Reserve.

Three Month Outlook

It's hard to believe we are in the last quarter of 2024; this means winter is just around the corner! But the cold and wind won't stop us. We are continuing with our exploration program, building our knowledge of the mineralization.

Even in winter, we are conducting our environmental baseline studies to ensure we have accurate data for all seasons. Once the technical studies confirm the project design, we intend to submit our Environmental Assessment (EA) Registration in early 2025 to begin the EA and permitting process.

Contact Information

Visit our website at www.fireflymetals.ca or email at comments@fireflymetals.ca

P.O. Box 610, Baie Verte, NL, A0K 1B0

Health, Safety and Environment

Baseline Studies

Land and Resource Use Survey: We want to hear from you!!

We will be in the community in early October to discuss the Land and Resource Use Survey. What is it, you ask? Well, it is a valuable tool to help us understand what and where people like to gather plants, hunt, enjoy the outdoors (e.g. snowmobiling, hiking) and do various other activities. No, it is not a way to know your favourite hunting or blueberry picking location (that is your secret!), instead, it will help us plan the mine design. For instance, we may need to build roads, clear areas for buildings and set up piping for fresh-water intake, and if we can, we want to avoid areas important to local communities and residents. Sometimes they can't be avoided, and we want to work with you to understand how to mitigate and reduce those potential effects of the Project.

You can use this QR Code to do the Survey – Thanks for your help!

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Record of Engagement

GENERAL Communities Below/Baie Verte Peninsula (Conferences, EDC, Joint Committees, social media, mass emails, radio ect..)								
Date (dd/mm/yy)	**Method Communication** (in-person, virtual, email, phone, information session, open house)	**Location**	**From** (Include all Names and Affiliations of who initiated the Consultation or Engagement)	**To** (Include all Names and Affiliations of who the Consultation or Engagement was directed)	**Brief Description**	**Follow-up**	**Resolution and date complete**	**Relevant Documents**
26-Sep-24	Social Media	Social Media	Facebook Post	Friends/Followers	Land and Resource use survey posted on Facebook with link to complete the survey	No	N/A	Post on Facebook, Land and Resource Use Survey
27-Sep-24	Posters	Work Site, Baie Verte and Ming's Bight	FireFly Representatives	General Public	Land and Resource survey description, purpose with QR code and link.	No	N/A	Poster
8-Oct-24	Social Media	Social Media	Facebook Post	Friends/Followers	Land and Resource use survey posted on Facebook with link to complete the survey. The post also announced that FireFly will have three locations/opportunities to meet representatives to hear more about the Project and the survey.	No	N/A	Post on Facebook, Land and Resource Use Survey
9-Oct-24	In-person	Baie Verte	FireFly Representatives	Regional event numerous communities and groups	Although hosted at the Co-Op Grocery Store 11am to 2pm, many residents from the Baie Verte Peninsula Shop at the stoe. We set up a table and greeted customers as they came into the store, explained the survey and gave copies of the survey either QR code/website or hard copies with prepaid envelops to complete the survey.	No	N/A	Survey Cards, hard copies of survey
9-Oct-24	In-Person Chamber of Commerce	Baie Verte	Bonnie Matthews(FireFly)	Chamber Members	Economic Development in the area, taskforce discussions moving forward. Deadline for submission coming up soon. Mentioned the Land and Resource Use Survey available on Facebook via QR code and link.	No	N/A	N/A
10-Oct-24	In-person	Baie Verte	FireFly Representatives	Regional event numerous communities and groups	Although hosted at the UltraMar Gas Station 6am to 7:30am, many residents from the Baie Verte Peninsula Shop at the store. We set up a table and greeted customers as they came into the store, explained the survey and gave copies of the survey either QR code/website or hard copies with prepaid envelops to complete the survey.	No	N/A	Survey Cards, hard copies of survey
10 Oct 204	In-person	Baie Verte	FireFly Representatives	Regional event numerous communities and groups	Although hosted at the Co-Op Grocery Store from 5pm to 7pm, many residents from the Baie Verte Peninsula Shop at the store. We set up a table and greeted customers as they came into the store, explained the survey and gave copies of the survey either QR code/website or hard copies with prepaid envelops to complete the survey.	No	N/A	Survey Cards, hard copies of survey
15-Oct-24	Social Media	Social Media	Facebook Post	Friends/Followers	Newsletter October 2024, Q3 Edition of the quarterly newsletter. includes info about baseline, Land Resource Survey, Resource vs. Reserve, staying local and local jobs.	No	N/A	Post on Facebook
15-Oct-24	Email - All communities in Baie Verte Peninsula	Email	TLeBlanc, Comments FireFly	All Communities on Baie Verte Peninsula	2024 3rd Edition of the Newsletter, includes info about baseline, Land Resource Survey discussed with QR code and link provided, Resource vs. Reserve, staying local and local jobs.	No	N/A	Q3 2024 Newsletter
18-Oct-24	Social Media	Social Media	Facebook Post	Friends/Followers	Post QR code and link to survey as a reminder to complete the Land and Resource Use Survey.	No	N/A	Post on Facebook
24-Oct-24	Social Media	Social Media	Facebook Post	Friends/Followers	Post QR code and link to survey as a reminder to complete the Land and Resource Use Survey that closes in 24 hrs.	No	N/A	Post on Facebook

Appendix 8.A Project Related Documents (1995-2024)

Report	Author	Date
Seasonal and Mining Influences on Stream-water Geochemistry in the Rambler Mines Area: Implications for Mineral Exploration and Environmental Monitoring	J.W. McConnel	1995
ABA Analysis of Rock Samples Collected at Rambler Site February 1997	Chemex Labs Ltd.	1997
Historical Acid Rock Drainage (ARD) Samples Rambler Site	Ming Financial Corp	1997
Stream-Water Geochemistry as a Guide to Sources of Acid-Mine Drainage in the Former Rambler Mines Area	J.W. McConnel	2002
Phase I Environmental Site Assessment Former Rambler Mine Property	Davis Engineering and Associates Ltd.	2005
Rambler Mine Wastewater Treatment Study - Bench Scale Treatability	ADI Limited	2006
Rambler Mine Wastewater Treatment Study - Bench Scale Treatability and Concept Design/Cost Estimate	ADI Limited	2006
2006 Baseline Environmental Effects Monitoring (EEM) Samples	Maxxam	2006
Baseline Water and Sediment Assessment Program, Ming Mine Newfoundland	Golder	2006
Rambler Mine Dewatering Wastewater Treatment System Commissioning Report	ADI Limited	2007
Rambler Mine Dewatering Wastewater Treatment System Operating and Maintenance Manual	ADI Limited	2007
Waste Water Treatment Plant (WWTP) updates sent to Department of Environment and Conservation (multiple reports)	Various	2007-2009
Ming Mine Environmental Effects Monitoring (EEM) Fish Test	Stantec	2007-2011
2008 Baseline Environmental Effects Monitoring (EEM) Samples	Maxxam	2008
Aquatic Survey of Tailings Options	AMEC	2008
Bathymetric Survey, South Brook Pond	AMEC	2008
2009 Baseline Environmental Effects Monitoring (EEM) Samples	Maxxam	2009
Registration Pursuant to Part X of the *Environmental Protection Act* for Ming Copper-Gold Mine	Rambler Metals and Mining Canada Ltd.	2010
Woman's Employment Plan	Rambler Metals and Mining Canada Ltd.	2010
Rambler Metals and Mining Canada Ltd. NI43101 Technical Report	Rambler Metals and Mining Canada Ltd.	2010
Ming Copper-Gold Mine Construction and Operations Activities Environmental Protection Plan	Rambler Metals and Mining Canada Ltd.	2011
Ming Mine - Design of Metal Mining Effluent Regulations (MMER) Cycle 1 Environmental Effects Monitoring (EEM)	Stantec Consulting Ltd.	2012
Effluent and Water Quality Monitoring Annual Report for 2011 - Ming Mine	Rambler Metals and Mining Canada Ltd.	2012

Report	Author	Date
Ming Mine Metal Mining Effluent Regulations (MMER) Cycle 1 Environmental Effects Monitoring (EEM) Interpretive Report for 2012 Biological Monitoring Studies	Stantec Consulting Ltd.	2013
Ming Mine's Test Pits Around the Ore Pad	M. Shiddo	2013
Effluent and Water Quality Monitoring Annual Report for 2012 - Ming Mine	Rambler Metals and Mining Canada Ltd.	2013
Ming Mine - Design of Mine Metal Mining Effluent Regulations (MMER) Cycle 1 Environmental Effects Monitoring (EEM) - Addendum	Stantec Consulting Ltd.	2014
Effluent and Water Quality Monitoring Annual Report for 2013 - Ming Mine	Rambler Metals and Mining Canada Ltd.	2014
Effluent and Water Quality Monitoring Annual Report for 2013 - Nugget Pond	Rambler Metals and Mining Canada Ltd.	2014
Ming Mine Mine Metal Mining Effluent Regulations (MMER) Cycle 1 Interpretive Report - Addendum	Stantec Consulting Ltd.	2014
Nugget Pond Cycle 4 Interpretive Report for 2014 Biological Monitoring Studies	Stantec Consulting Ltd.	2015
Ming Mine - Design of Mine Metal Mining Effluent Regulations (MMER) Cycle 2 Environmental Effects Monitoring (EEM)	Stantec Consulting Ltd.	2015
Ming Mine Cycle 2 Environmental Effects Monitoring (EEM) Interpretive Report	Stantec Consulting Ltd.	2016
Baseline Air Quality Assessment Report	GHD	2017
Tailings Management Facility Expansion, Ming Copper-Gold Mine Environmental Assessment Registration	Rambler Metals and Mining Canada Ltd.	2017
Ming Copper-Gold Mine Updated Rehabilitation and Closure Plan	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold - Environmental Contingency Plan	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold Mine - Construction and Operation Activities Environmental Protection Plan (EPP)	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold Mine - Waste Management Plan	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold Mine -Nugget Pond Facility, Operation Management & Surveillance Manual	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold - Development Plan Update	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold Mine - Development Plan Updated Appendices	Rambler Metals and Mining Canada Ltd.	2018
Ming Copper-Gold Mine - Updated Rehabilitation and Closure Plan	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Copper-Gold Mine - Technical Report Update	WSP	2018

Report	Author	Date
Tailings Management Facility Expansion, Ming Copper-Gold Mine Environmental Preview Report	Rambler Metals and Mining Canada Ltd.	2018
Ming Mine Phase 3 Environmental Effects Monitoring (EEM) Interpretive Report	Stantec Consulting Ltd.	2019
Surface Water and Sediment Quality Sampling Program, Rambler Ming Mine	GEMTEC	2019
Metals Leaching / Acid Rock Drainage Assessment, Boundary Shaft Site, Ming Mine	GEMTEC	2019
Ming Mine 2021 Data Report	Rambler Metals and Mining Canada Ltd.	2021
Nugget Pond 2021 Data Report	Rambler Metals and Mining Canada Ltd.	2021
Ming Mine 2022 Data Report	Rambler Metals and Mining Canada Ltd.	2022
Nugget Pond 2022 Data Report	Rambler Metals and Mining Canada Ltd.	2022
Effluent and Water Quality Monitoring Annual Report for 2022 - Ming Mine	Rambler Metals and Mining Canada Ltd.	2022
Ming Mine Phase 4 Environmental Effects Monitoring (EEM) Interpretive Report	Stantec Consulting Ltd.	2023
Effluent and Water Quality Monitoring Annual Report for 2023 - Ming Mine	Rambler Metals and Mining Canada Ltd.	2024
Respectful Workplace Policy	FireFly Metals	2024
Human Rights and Freedoms Policy	FireFly Metals	2024
Diversity Plan	FireFly Metals	2024
Inclusion, Diversity, Equity, and Accessibility Plan	FireFly Metals	2024
Environmental Contingency Plan for FireFly Metals Canada Limited Green Bay Ming Mine Project and Current Operations	FireFly Metals	2024
Operation Management and Surveillance Manual	FireFly Metals	2024
FireFly Metals Emergency Response Plans	FireFly Metals	2024
Preliminary Effluent Quality Evaluation in Support of the Green Bay Ming Mine Project	Ecometrix	2024
National Instrument 43-101 Technical Report, FireFly Metals Ltd., Ming Copper-Gold Project, Newfoundland	WSP Canada Inc.	2024