



Appendix D1

Avifauna Baseline Study

Appendix D1

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List of Acronyms & Abbreviations

Abbreviation	Definition
AC CDC	Atlantic Canada Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CR	Critically endangered
DD	Data Deficient
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EN	Endangered
EW	Extinct in the Wild
GPS	Global positioning System
ID	Identification
IUCN	International Union for Conservation of Nature
LAA	Local Assessment Area
LC	Least Concern
LP	Limited Partnership
MBCA	Migratory Birds Convention Act
MBR	Migratory Birds Regulations
NAR	Not at Risk
NE	Not Evaluated
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador Endangered Species Act
NL WD	Newfoundland and Labrador Wildlife Division
NT	Near Threatened
PCMP	Post Construction Monitoring Plan
POA	Port of Argentia
SAR	Species at Risk
SAR IMMP	Species at Risk Impacts Mitigation and Monitoring Plan
SARA	Species at Risk Act
SCC	Species of Conservation Concern
SSAC	Species Status Advisory Committee
VU	Vulnerable
WD	Wildlife Division
XT	Extinct

1.0 Introduction

The Avifauna Baseline Study has been developed by Argentia Renewables Wind LP (Argentia Renewables), an affiliate of Pattern Energy Group LP (Pattern Energy) for the Argentia Renewables Project (the Project), which entails the development, construction, operation and maintenance, and eventual decommissioning and rehabilitation of an onshore wind energy generation facility (Argentia Wind Facility) and a green hydrogen and ammonia production, storage, and export facility (Argentia Green Fuels Facility). The wind energy facility (i.e., wind turbine farm) will be mostly located on what is known as the Argentia Backlands, a largely uninhabited, forested area with scattered relic military sites and variable habitat types. The Argentia Green Fuels Facility will be located on the Argentia Peninsula, a brownfield industrial complex. The Port of Argentia (POA) owns both the Argentia Backlands property and property on the Argentia Peninsula. The two, along with a Project Interconnect Line, comprise the Argentia Renewables Project Area. This baseline study focuses on summarizing the existing conditions for avifauna in the Project Area, and to some extent, in the Local Assessment Area (LAA).

Surveys were designed to ensure a comprehensive list of species using the Project Area in each season of the year (including both migratory and resident birds). Resident and migratory species of birds in Newfoundland include representatives from the bird Orders Anseriformes (Waterfowl), Galliformes (Gamebirds), Gaviiformes (Loons), Accipitriformes (Raptors), Charadriiformes (Shorebirds), Columbiformes (Doves), Gruiformes (Rails), Strigiformes (Owls), Caprimulgiformes (Nightjars), Coraciiformes (Kingfishers), Piciformes (Woodpeckers), and Passeriformes (Perching birds). Many Families of birds are protected by the Federal **Migratory Birds Convention Act** (MBCA), including all waterfowl species and many perching birds. Raptors and Owls are protected under provincial legislation. SAR are protected under the Newfoundland and Labrador **Endangered Species Act** (NL ESA) and the Federal **Species at Risk Act** (SARA).

Surveys were conducted throughout the Project Area to ensure coverage of all habitat types, with a particular focus on terrestrial species, and some supplementary marine/coastal surveys. Surveys were designed to create a species inventory (and some estimates of relative abundance) for the Project Area, to determine which water-associated birds used the coast and marine environment adjacent to the Project Area, and to ensure that raptors were adequately surveyed using drones and on-the-ground surveys. Surveys included spring migration, breeding season, fall migration, and winter residents.

This document will be updated prior to commencement of construction to reflect additional field surveys.

1.1 Regulatory Context

Federal and provincial regulations for avifauna are outlined in the subsequent sections.

1.1.1 Federal

The MBCA was implemented to protect migratory bird individuals, populations, and their nests. In addition, the **Migratory Birds Regulations** (MBR) prohibit the capture, kill, take, injury, or harassment of a migratory bird, and protects migratory bird nests with species-specific measures. Species protected under the MBCA and MBR include warblers, thrushes, chickadees, sparrows, flycatchers, waterfowl, swallows, gulls, and terns, among others. In Newfoundland and Labrador (NL), almost all bird Families are federally protected by this legislation.

Migratory birds that are Species at Risk (SAR) are further protected under SARA. SARA was implemented to protect endangered or threatened wildlife from becoming more “at risk” or extinct. Species are listed and protected by SARA based on recommendations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Species protected under the SARA, that are known to occur in NL, are listed in Table D1-1.1.1-1 below. Species with the potential to occur in the Project Area and/or LAA are discussed in more detail in Section 3.1.3.5 of the Registration Document and in Appendix R (Species at Risk Mitigation and Monitoring Plan).

Table D1-1.1.1-1 SARA Schedule 1 Species in Newfoundland and Labrador.

Common Name	Scientific Name	COSEWIC Status	SARA Status (S1)	IUCN Red List
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	Threatened (2016)	Threatened (2019)	Least Concern
Bank Swallow	<i>Riparia riparia</i>	Threatened (2013)	Threatened (2017)	Least Concern
Barn Swallow	<i>Hirundo rustica</i>	Special Concern (2021)	Threatened (2017)	Least Concern
Barrows Goldeneye	<i>Bucephala islandica</i>	Special Concern (2011)	Special Concern (2003)	Least Concern
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened (2010)	Threatened (2017)	Least Concern
Chimney Swift	<i>Chaetura pelagica</i>	Threatened (2018)	Threatened (2009)	Vulnerable
Common Nighthawk	<i>Chordeiles minor</i>	Special Concern (2018)	Threatened (2010)	Least Concern
Eskimo Curlew	<i>Numenius borealis</i>	Endangered (2009)	Endangered (2003)	Critically Endangered
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Special Concern (2016)	Special Concern (2019)	Vulnerable
Harlequin Duck	<i>Histrionicus histrionicus</i>	Special Concern (2013)	Special Concern (2003)	Least Concern

Common Name	Scientific Name	COSEWIC Status	SARA Status (S1)	IUCN Red List
Ivory Gull	<i>Pagophila eburnea</i>	Endangered (2006)	Endangered (2003)	Near Threatened
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Special Concern (2018)	Special Concern (2023)	Near Threatened
Peregrine Falcon	<i>Falco peregrinus tundrius/antum</i>	Not At Risk (2017)	Special Concern (2012)	Least Concern
Piping Plover	<i>Charadrius melodus melodus</i>	Endangered (2013)	Endangered (2003)	Near Threatened
Red Knot (rufa) (South America wintering)	<i>Calidris canutus rufa</i>	Endangered (2020)	Endangered (2012)	Near Threatened
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Special Concern (2014)	Special Concern (2019)	Least Concern
Ross's Gull	<i>Rhodostethia rosea</i>	Endangered (2021)	Threatened (2003)	Least Concern
Rusty Blackbird	<i>Euphagus carolinus</i>	Special Concern (2017)	Special Concern (2009)	Vulnerable
Short-eared Owl	<i>Asio flammeus</i>	Threatened (2021)	Special Concern (2012)	Least Concern

1.1.2 Provincial

The NL ESA provides provincial protection for species designated as Endangered, Threatened, or Vulnerable in NL. The NL ESA ranks species based on the recommendations of the provincial Species Status Advisory Committee (SSAC) and the SARA, which is based on the reporting efforts of COSEWIC. There are eighteen avian SAR protected under the NL ESA, listed in Table D1-1.1.2-1 below.

Table D1-1.1.2-1 NL ESA Species List.

Common Name	Scientific Name	Provincial Status
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	Threatened (2022)
Bank Swallow	<i>Riparia riparia</i>	Threatened (2022)
Barrows Goldeneye	<i>Bucephala islandica</i>	Vulnerable (2000)
Bobolink	<i>Dolichonyx oryzivorus</i>	Vulnerable (2015)
Chimney Swift	<i>Chaetura pelagica</i>	Threatened (2007)
Common Nighthawk	<i>Chordeiles minor</i>	Threatened (2007)
Eskimo Curlew	<i>Numenius borealis</i>	Endangered (2000)
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	Vulnerable (2022)
Harlequin Duck	<i>Histrionicus histrionicus</i>	Vulnerable (2001)
Ivory Gull	<i>Pagophila eburnea</i>	Endangered (2006)
Newfoundland Grey-Cheeked Thrush	<i>Catharus minimus minimus</i>	Threatened (2015)
Olive-Sided Flycatcher	<i>Contopus cooperi</i>	Threatened (2009)
Peregrine Falcon	<i>Falco peregrinus tundrius/antum</i>	Vulnerable (2007)
Piping Plover	<i>Charadrius melodus melodus</i>	Endangered (2000)

Common Name	Scientific Name	Provincial Status
Red Knot (rufa) (South America wintering)	<i>Calidris canutus rufa</i>	Endangered (2007)
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Vulnerable (2022)
Rusty Blackbird	<i>Euphagus carolinus</i>	Vulnerable (2007)
Short-eared Owl	<i>Asio flammeus</i>	Vulnerable (2008)

2.0 Methods

2.1 Desktop Review

A comprehensive data and literature review was conducted to gather information on bird species known to occur within or near the Project Area, and throughout the region. First, a review of the Atlantic Canada Conservation Data Centre (AC CDC) results within a 5 km radius of the Project Area was undertaken. The results from that data query helped to inform surveys for SAR and SCC in the Project Area. Sensitive habitats present in the Project Area were identified through this process and by using the Ecological Land Classification (ELC) map (Appendix D3). Field survey maps were then generated using ArcGIS with demarcated Project Area boundaries and habitat types.

2.2 Field Studies

A wide variety of survey methods were necessary to encompass such a vast biodiversity of birds occupying so many different niches, from the terrestrial passerine species occupying myriad habitat types and which are most easily surveyed by song/call, to raptors and owls, which require drone efforts and ground transects, to water birds that require scans of marine and freshwater environments with high-resolution scopes. In addition, autonomous recording units (i.e., SongMeters) supplemented the field surveys with additional information.

2.2.1 Acoustic Monitoring

Two Wildlife Acoustics™ SongMeter SM4 Acoustic Recorders (SongMeters) were placed in the Argentia Backlands in 2023. The recorders were deployed from April 22 to October 18, 2023. They were set to record for 60 minutes three times a day: once before sunrise, once before sunset, and once during the night. Sunset and sunrise comprise prime bird activity periods and dominant singing periods, and nighttime recordings aim to capture nocturnal species such as owls.

The sites selected for acoustic monitoring represented multi-habitat transitional areas to maximize the variety of birds detected from different ecological niches. SongMeter 1 was placed near a small stream discharging from Gull Pond, where it passes through a coniferous thicket and forms a pool near a marsh

wetland (UTM 22T, 278693 E, 5240214 N). This area provided a variety of habitats suitable for species such as forest birds, waterbirds, shorebirds, and wetland species. Additionally, due to its relatively high elevation, SongMeter 1 had the potential to record calls from bird flyovers, including from raptors.

SongMeter 2 was placed at an intermediate elevation near a transition between mature coniferous forest and pond, riparian, and wetland habitats (UTM 22T, 275827 E, 5240933 N). In addition, the location was proximate to anthropogenically-created shrub and meadow habitat around Argentia Pond.

All data obtained from the six-month deployment was processed and incorporated into a dataset for analysis using the Kaleidoscope Pro Analysis software. Analytical processing classified signals and identified each call or song to species. This dataset, given the long deployment (encapsulating spring migration, breeding season, and fall migration), ensured that the species inventory of birds using the Project Area was as complete as possible.

2.2.2 Bird Surveys

Bird surveys were conducted throughout the Project Area beginning in fall 2022 and continuing through all of 2023 and 2024. A combination of survey techniques was required to survey the diversity of species in the Project Area and LAA, including point count surveys, transect surveys, scans of wetlands and waterbodies, and sky scans for migratory raptors. Survey effort was stratified proportionally by habitat type, with emphasis on specialized habitats like wetlands due to their suitability for several of the bird SAR. Survey effort is demonstrated in the following map (Figure D1-2.2.2-1).

Bird surveys are ongoing throughout 2024, and further information will be available once the study is complete. These surveys follow the same methodology as previous years and are being conducted in consultation with regulatory authorities.

Surveys were not conducted during inclement weather (e.g., excessive wind, rain or snow) as such conditions can reduce the detectability of birds and result in the under-representation of bird presence. As per E guidance, wind was tracked using the Beaufort scale and visibility was used as an indicator of weather conditions that would limit bird activity levels (ECCC, 2023). Height data was gathered for spring and fall surveys to facilitate the effects assessment section of the Registration document.

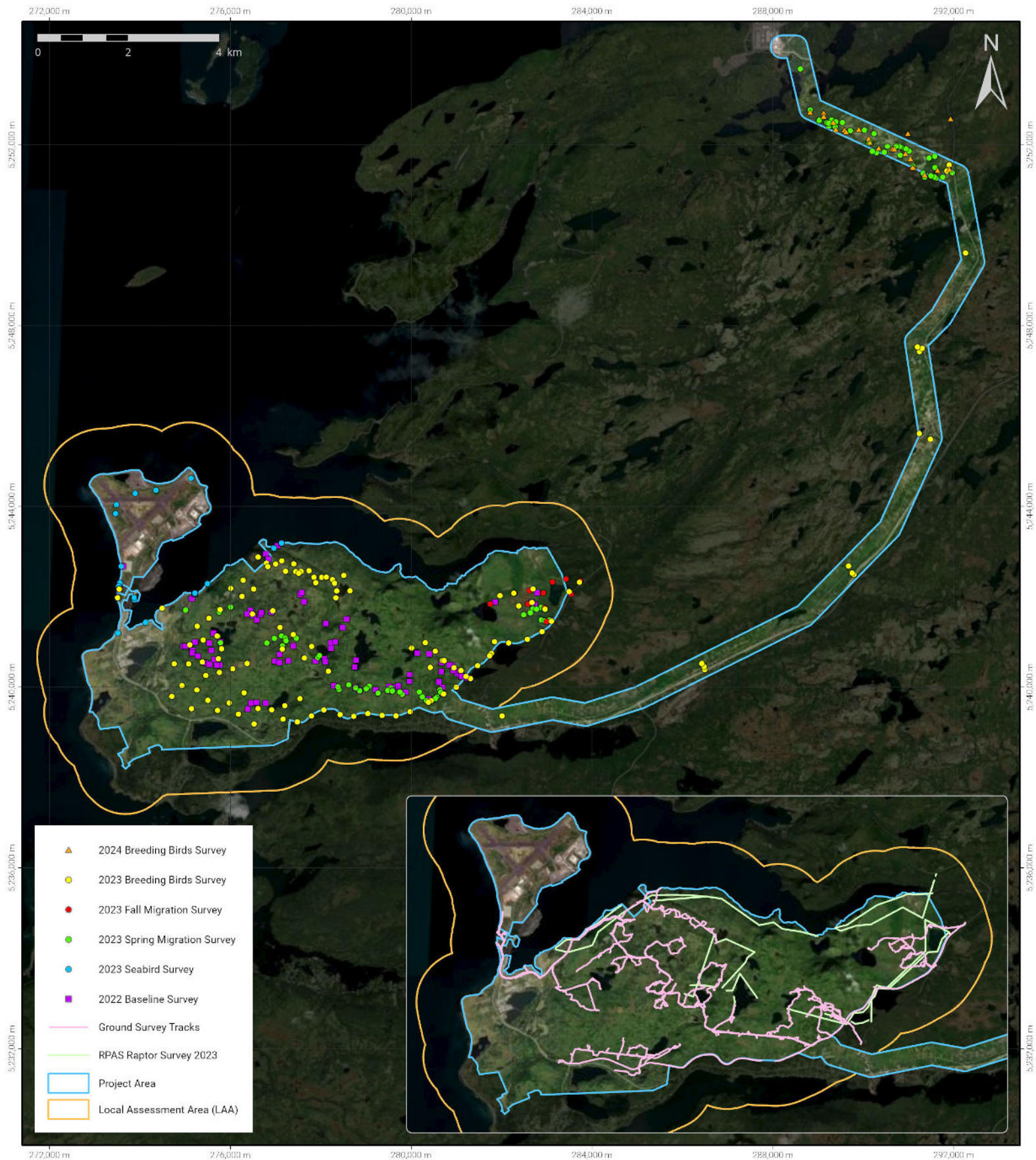


	FIGURE NUMBER: D1 - 2.2.2 - 1	COORDINATE SYSTEM: NAD 1983 CSRS UTM Zone 22N	PREPARED BY: C. Bursey	DATE: 24/07/26
	FIGURE TITLE: Survey Effort for Avifauna 2022-2024	NOTES: RPAS - Remotely Piloted Aircraft System	REVIEWED BY: 	APPROVED BY:
	PROJECT TITLE: Argentia Renewables			

Data recorded across all bird survey types included:

- Date;
- Waypoint/Survey Location ID;
- GPS Coordinates;
- Habitat of Location/Key Features;
- Weather;
- Significant Weather Previous to Survey;
- Time;
- Sex (where possible);
- Number of Species Observed;
- Observation Type (auditory, visual, and appropriate breeding indications where applicable);
- Position (i.e., Ground, Perched, Flying including height above ground); and,
- Direction of Travel (where possible).

Survey types are discussed in more detail below.

Point Counts

Point count surveys are often used in terrestrial environments to obtain a measure of species richness and relative abundance. Ten-minute point counts were conducted during breeding season at predetermined GPS points that represented several habitat types, with a subset focused on habitats suitable for SAR. Each survey was conducted by a biologist experienced in auditory and visual identification of birds in this region. Observations included songs, calls, breeding displays, drums (for woodpeckers), and other behaviours (e.g., tail-pumping, food carrying, etc.). All terrestrial ecotypes (from the ELC) in the Project Area were surveyed and effort was stratified according to the significance of each habitat.

Opportunistic point counts were also conducted as one-off surveys during other field work (e.g., rare lichens surveys), to bolster coverage of large areas and provided an enhanced opportunity to encounter and record species that may have been difficult to observe during predetermined point counts (e.g., species with quieter vocalizations).

Atlassing Transects

In addition to point counts, systematic “atlassing” transects were conducted throughout the Project Area, recording visual and auditory observations, combined with “pishing” to encourage observations (a

technique widely used by birders to increase proximity to birds). Survey transects extended throughout the Project Area and focused coverage proportionally according to habitat type. Habitat suitability was informed by the ELC (Appendix D3). The walking pace varied based on habitat type, topography, and the number of detections (i.e., bird activity). Transects began shortly after sunrise (or as early as was logistically feasible) and they were concluded depending on the level of bird activity observed. These transects are less rigid than point counts in that the observer can leave the transect to seek more information and can use techniques like pishing or playbacks to bolster observations. More information on habitat use can often be obtained from atlassing transects than from point counts (point counts focus heavily on singing males).

Raptor Scans

Raptor scans were conducted opportunistically along atlassing transects or between point count stations and using high-resolution binoculars and scopes. Raptor scans were conducted by choosing a high vantage point with a large swath of open sky visible, such as in the rocky outcrops of the Argentia Backlands, or throughout the open expanse of the Argentia Peninsula. For a selected period (10 or 30 minutes, depending on activity and weather), the observer scanned the sky for raptors. In addition to dedicated opportunistic raptor scans, any raptor observations during other field surveys were also recorded.

Seabird Surveys

Shoreline point count surveys were conducted for seabirds at predetermined locations and opportunistically during other surveys. These surveys were typically completed bi-weekly on the Argentia Peninsula and along the west and northwest shores of the Argentia Backlands. Seabirds in flight were identified by sight using high-quality optics. Scans were also made along the surface of the water. The altitude and direction of travel for flying seabirds were observed and recorded in addition to estimates of the number of individuals.

2.2.2.1 2022 Fall Bird Surveys

In fall 2022, bird surveys were conducted bi-weekly between September 26 and December 8, 2022. Atlassing transects and opportunistic point counts were distributed throughout the Argentia Backlands and other sections of the Project Area. Observations compiled during other terrestrial surveys (e.g., rare lichens, ELC) also contributed to incidental data for fall birds. This supplementary data was used to inform dedicated efforts for SAR, and to plan 2023 surveys. Raptor scans were also conducted opportunistically.

Seabird surveys were conducted with point counts along the coastline of the Project Area. Point locations were designated on either side of the Argentia Peninsula where access was possible, and within Cooper

Cove. Each point count was 30 or 60 minutes, depending on conditions and activity. High-quality binoculars and long-range scopes were used to assist in seabird detection, allowing for observations up to 1000 m from the observers.

2.2.2.2 2023 Bird Surveys (All Seasons)

Bird surveys were conducted throughout 2023, starting with bi-weekly surveys throughout winter to observe winter residents and then weekly surveys during spring migration. Breeding bird surveys were conducted daily in June with point counts and atlassing transects. Seasons, dates, and survey frequency for all bird surveys in 2023-2024 are listed in Table D1-2.2.2-1.

Table D1-2.2.2-1 Bird Survey Seasonal Windows, 2023.

Season	Survey Dates	Survey Frequency
Spring Migration	May 7 – June 7, 2023	Weekly
Breeding Season	June 7 – June 27, 2023	Daily intensive survey
Fall	September 26, 2023 – January 3, 2024	One day survey, bi-weekly
Winter*	January 3 – March 31, 2024	One day survey, bi-weekly
NOTES		
*results for winter 2024 are currently being analyzed and will be included in a report in late 2024.		

Spring Migration 2023

Spring surveys incorporated ten (10) point counts across a range of habitat types. Surveys aimed to collect data across the progression of bird species migration in the Project Area throughout the season. Point count locations were positioned in the eastern, coniferous forest-dominated zone of the Project Area, and within a large wetland in a Mixedwood portion of the Argentia Backlands. Point counts were conducted once weekly.

Breeding Bird Surveys 2023

Ninety-six breeding bird point count surveys were conducted daily from June 7 to June 27, 2023, which coincided with peak breeding season in insular Newfoundland. Counts were stratified by habitat type to ensure sampling across ecological niches.

In addition to seeking relative abundances for each species using the Project Area (through point counts), effort was also placed on detecting nests and breeding bird behavioural cues (e.g., carrying nest material, courtship behavior, food carrying, etc.) via atlassing transects. All birds observed during these surveys were documented, regardless of whether their breeding status was known.

Fall Migration 2023

Fall bird surveys were conducted to assess bird migration through the Project Area, an important consideration for the effects assessment of wind projects on avifauna. Eight-point count locations were established in 2022 across several ecological niches (e.g., forest, wetland, marine, etc.), and were repeated in 2023 every two weeks to establish whether the Project Area appeared to be important to any migratory species (and migratory SAR bird species) as stopover habitat.

3.0 Results

3.1 Desktop Review

Several sources of information were researched to compile a list of potential bird species, including SAR and SCC, for the Project Area and the LAA. Results are discussed below by information source.



3.1.1 AC CDC Results

Fifteen S-ranked species (from a 5 km radius around the center of the Project Area) were listed in the results of the AC CDC data query. The AC CDC observation records indicated that several known rare birds have been documented in the Project Area. The rare birds known for the Project Area are listed in Table D1-3.1.1-1. Their S-ranks (measures of species rarity developed by AC CDC) are provided in Appendix D1.1. A map of the GPS points associated with the AC CDC observations is presented as Figure D1-3.1.1-1 below.

Table D1-3.1.1-1 AC CDC Results for rare birds known from a 5 km radius of the center of the Project Area.

Common Name	Scientific Name	S Rank (2015)	Years Observed	Location
American Golden-plover	<i>Pluvialis dominica</i>	S3M	2020	Unknown
Black-Bellied Plover	<i>Pluvialis squatarola</i>	S3M	2020, 2021	Unknown
Gray-cheeked Thrush	<i>Catharus minimus</i>	S2B, SUM	1991	Dunville
Greater Yellowlegs	<i>Tringa melanoleuca</i>	S3B, S4M	2021	Unknown
Harlequin Duck	<i>Histrionicus histrionicus</i>	S3B, S2N, SUM	1974	Argentia
Horned Lark	<i>Eremophila alpestris</i>	S3B, SUM	2021	Unknown
Lesser Yellowlegs	<i>Tringa flavipes</i>	S3M	2021	Unknown
Northern Goshawk	<i>Accipiter gentilis</i>	S3	2002	Unknown
Northern Harrier	<i>Circus cyaneus</i>	S3B, SUM	2002, 2020, 2021	Unknown
Sanderling	<i>Calidris alba</i>	S3M	2020	Unknown
Short-eared Owl	<i>Asio flammeus</i>	S3B, SUM	1991, 2019, 2021	Argentia Peninsula



 Pattern Argentia Renewables	FIGURE NUMBER: D1 - 3.1.1 - 1	COORDINATE SYSTEM: NAD 1983 CSRS UTM Zone 22N	PREPARED BY: J. Crocker	DATE: 24/07/27
	FIGURE TITLE: AC CDC Rare Fauna Results in the Project Area	NOTES: Data retrieved from the Atlantic Canada Conservation Data Centre (AC CDC).	REVIEWED BY: <i>Churke</i>	APPROVED BY: <i>Churke</i>
	PROJECT TITLE: Argentia Renewables			

3.1.2 Breeding Bird Atlas

The Project Area falls within the Atlas Region 7 of the Newfoundland Breeding Bird Atlas, under map numbers 22TBT74 and 22TBT84 (Birds Canada, 2023). These square regions comprise the entirety of the Project Area. Of the 126 breeding species reported for the Avalon Peninsula (Birds Canada, 2023), map 22TBT74 (comprising the largest portion of the Project Area) reports 103 breeding birds. One SAR was known from these data to breed in the Project Area, the Red Crossbill *percna* subspecies. Other significant findings from these data included breeding pairs of Northern Harrier and Northern Goshawk, two raptor species which each warrant setback buffers around nests.

3.2 Field Studies

3.2.1 Acoustic Monitoring

To supplement survey data, automated recording units (SongMeters) were deployed at two locations for spring, summer, and fall of 2023. The results of both SongMeters are presented in Figure D1-3.2.1-1.

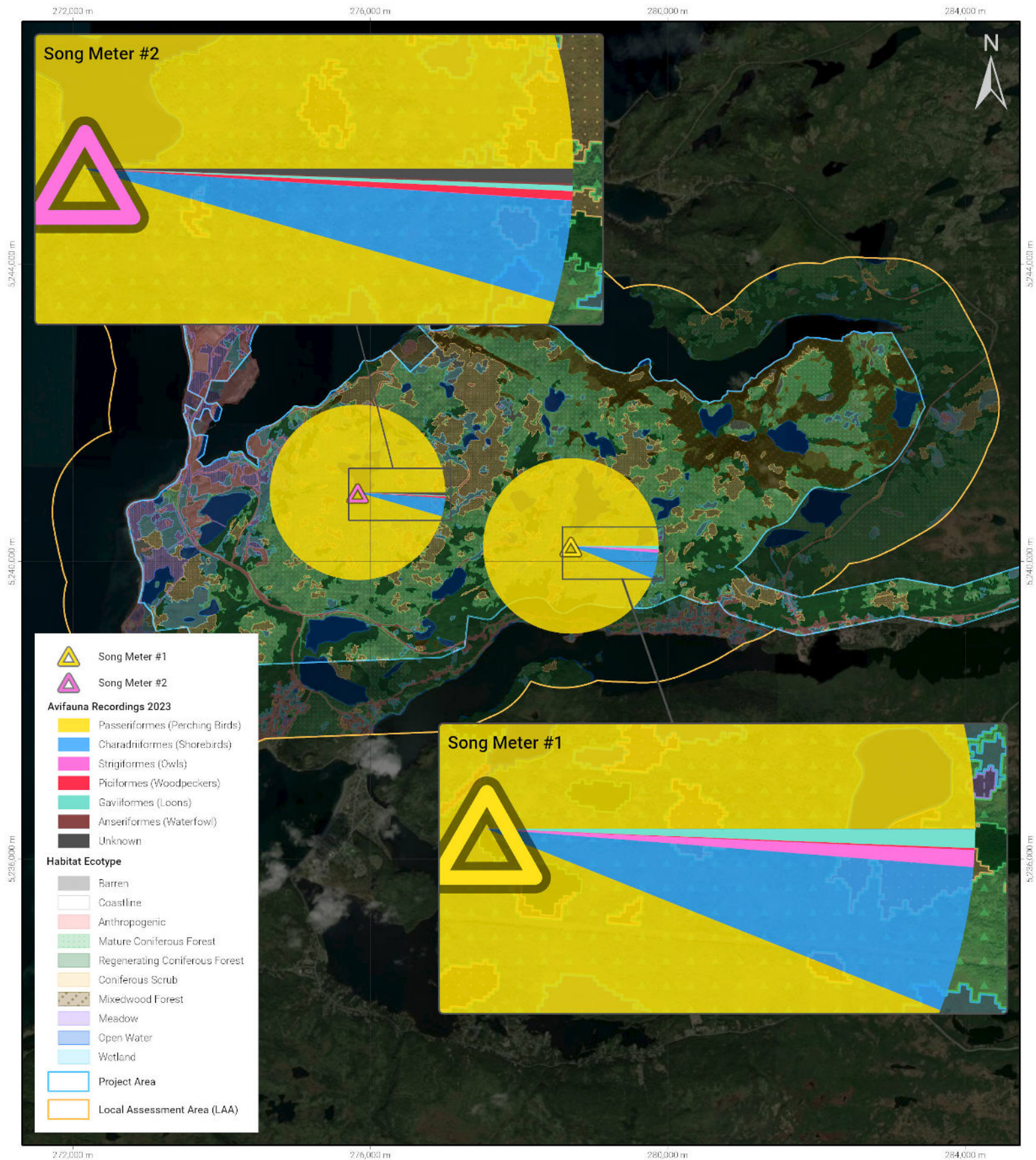


	FIGURE NUMBER: D1 - 3.2.1 - 1	COORDINATE SYSTEM: NAD 1983 CSRS UTM Zone 22N	PREPARED BY: C. Burke	DATE: 5/17/2024
	FIGURE TITLE: Acoustic Monitoring Results	NOTES:	REVIEWED BY:	
	PROJECT TITLE: Argentia Renewables		APPROVED BY:	

3.2.1.1 SongMeter 1

SongMeter 1 was deployed from April 22 to October 18, 2023. The most detected species was the White-throated Sparrow, followed by Blackpoll Warbler, American Robin, Yellow-bellied Flycatcher, and Fox Sparrow. The total acoustic observations from SongMeter 1 are listed in Table D1-3.2.1-1 below. The acoustic observations from SongMeter 1 results are further expanded to show total observations per month in Appendix D1.2.

Table D1-3.2.1-1 SongMeter 1 Acoustic Observation Totals, 2023.

Common Name	Scientific Name	Number of Acoustic Observations
White-throated Sparrow	<i>Zonotrichia albicollis</i>	100,860
Blackpoll Warbler	<i>Setophaga striata</i>	86,384
American Robin	<i>Turdus migratorius</i>	49,932
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	44,417
Fox Sparrow	<i>Passerella iliaca</i>	28,918
Wilson's Snipe	<i>Gallinago delicata</i>	18,431
Yellow-rumped Warbler	<i>Setophaga coronata</i>	11,763
Dark-eyed Junco	<i>Junco hyemalis</i>	9,824
Black-and-white Warbler	<i>Mniotilta varia</i>	8,309
Northern Waterthrush	<i>Parkesia noveboracensis</i>	9,174
Hermit Thrush	<i>Catharus guttatus</i>	7,111
Swamp Sparrow	<i>Melospiza georgiana</i>	5,699
Boreal Chickadee	<i>Poecile hudsonicus</i>	4,248
Ruby-crowned Kinglet	<i>Regulus calendula</i>	3,462
Common Loon	<i>Gavia immer</i>	2,511
Magnolia Warbler	<i>Setophaga magnolia</i>	2,268
Great Horned Owl	<i>Bubo virginianus</i>	2,246
American Crow	<i>Corvus brachyrhynchos</i>	1,675
Pine Grosbeak	<i>Pinicola enucleator</i>	1,000
White-winged Crossbill	<i>Loxia leucoptera</i>	674
Greater Yellowlegs	<i>Tringa melanoleuca</i>	550
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	368
Mourning Warbler	<i>Geothlypis philadelphia</i>	268
Northern Flicker	<i>Colaptes auratus</i>	152
Winter Wren	<i>Troglodytes hiemalis</i>	86
Woodpecker spp. (Drum)	<i>Picidae spp.</i>	84
Herring Gull	<i>Larus argentatus</i>	80
Black-throated Green Warbler	<i>Setophaga virens</i>	52
Golden-crowned Kinglet	<i>Regulus satrapa</i>	32
Black-capped Chickadee	<i>Poecile atricapillus</i>	12
Mallard	<i>Anas platyrhynchos</i>	7
Gray Jay	<i>Perisoreus canadensis</i>	6

3.2.1.2 SongMeter 2

SongMeter 2 was deployed from April 22 to October 18, 2023. The most detected species was the American Robin, followed by the White-throated Sparrow, Ruby-crowned Kinglet, Yellow-rumped Warbler, and Fox Sparrow. The total acoustic observations from SongMeter 2 are listed in Table D1-3.2.1-1. The acoustic observations from SongMeter 2 results are further expanded to show total observations per month in Appendix D1.3.

Table D1-3.2.1-1 SongMeter 2 Acoustic Observation Totals, 2023.

Common Name	Scientific Name	Number of Acoustic Observations
American Robin	<i>Turdus migratorius</i>	36,923
White-throated Sparrow	<i>Zonotrichia albicollis</i>	29,174
Blackpoll Warbler	<i>Setophaga striata</i>	18,728
Ruby-crowned Kinglet	<i>Regulus calendula</i>	5,709
Yellow-rumped Warbler	<i>Setophaga coronata</i>	4,806
Fox Sparrow	<i>Passerella iliaca</i>	3,929
Wilson's Snipe	<i>Gallinago delicata</i>	3,795
Swamp Sparrow	<i>Melospiza georgiana</i>	2,761
Northern Waterthrush	<i>Parkesia noveboracensis</i>	2,526
Savannah Sparrow	<i>Passerculus sandwichensis</i>	1,948
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	1,458
Black-and-white Warbler	<i>Mniotilta varia</i>	949
Hermit Thrush	<i>Catharus guttatus</i>	930
American Crow	<i>Corvus brachyrhynchos</i>	859
Northern Waterthrush	<i>Parkesia noveboracensis</i>	755
Boreal Chickadee	<i>Poecile hudsonicus</i>	651
Gray Jay	<i>Perisoreus canadensis</i>	594
Black-capped Chickadee	<i>Poecile atricapillus</i>	365
Dark-eyed Junco	<i>Junco hyemalis</i>	362
Northern Flicker	<i>Colaptes auratus</i>	361
Spotted Sandpiper	<i>Actitis macularius</i>	337
White-winged Crossbill	<i>Loxia leucoptera</i>	311
Common Loon	<i>Gavia immer</i>	284
Wilson's Warbler	<i>Cardellina pusilla</i>	188
Gull Spp.	<i>Larinae spp.</i>	150
Yellow Warbler	<i>Setophaga petechia</i>	125
Common Raven	<i>Corvus corax</i>	102
Mallard	<i>Anas platyrhynchos</i>	90
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	52
American Goldfinch	<i>Spinus tristis</i>	45

Common Name	Scientific Name	Number of Acoustic Observations
Palm Warbler	<i>Setophaga palmarum</i>	39
Golden-crowned Kinglet	<i>Regulus satrapa</i>	26
Greater Yellowlegs	<i>Tringa melanoleuca</i>	21
Great Horned Owl	<i>Bubo virginianus</i>	15
Red-breasted Nuthatch	<i>Sitta canadensis</i>	6

3.2.2 Bird Surveys

Field surveys conducted throughout the Project Area in 2022 and 2023, with a focus on the Argentinia Backlands (the proposed site of the turbines, and presumably the area with the highest potential for interaction with birds), resulted in the identification of 62 species.

3.2.2.1 Fall 2022 Survey Results

Surveys conducted bi-weekly in the fall of 2022 yielded the results shown in Table D1-3.2.2-1. The most detected species were the common and loud-singing White-throated Sparrow, American Robin, Yellow-rumped Warbler, Golden-crowned Kinglet, and Boreal Chickadee.

Table D1-3.2.2-1 Fall Bird Survey Totals, 2022.

Fall Bird Survey Totals, September 26 – December 8, 2022		
Species Common Name	Latin Name	Count of Species
White-throated Sparrow	<i>Zonotrichia albicollis</i>	76
American Robin	<i>Turdus migratorius</i>	63
Yellow-rumped Warbler	<i>Setophaga coronata</i>	41
Golden-Crowned Kinglet	<i>Regulus satrapa</i>	62
Boreal Chickadee	<i>Poecile hudsonicus</i>	56
Dark-Eyed Junco	<i>Junco hyemalis</i>	31
Black-Capped Chickadee	<i>Poecile atricapillus</i>	29
Canada Jay	<i>Perisoreus canadensis</i>	23
American Goldfinch	<i>Spinus tristis</i>	21
White-Throated Sparrow	<i>Zonotrichia albicollis</i>	18
American Crow	<i>Corvus brachyrhynchos</i>	18
Red Breasted Merganser	<i>Mergus serrator</i>	19
Northern Flicker	<i>Colaptes auratus</i>	16
Blue Jay	<i>Cyanocitta cristata</i>	12
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	11
Semipalmated Plover	<i>Charadrius semipalmatus</i>	10
Herring Gull	<i>Larus argentatus</i>	6
Swamp Sparrow	<i>Melospiza georgiana</i>	5
Long-Tailed Duck	<i>Clangula hyemalis</i>	5

Fall Bird Survey Totals, September 26 – December 8, 2022		
Species Common Name	Latin Name	Count of Species
Common Raven	<i>Corvus corax</i>	4
American Robin	<i>Turdus migratorius</i>	4
White-Winged Crossbill	<i>Loxia leucoptera</i>	4
Bald Eagle	<i>Haliaeetus leucocephalus</i>	3
Pine Siskin	<i>Pinus sinus</i>	3
Fox Sparrow	<i>Passerella iliaca</i>	3
Wilson's Snipe	<i>Gallinago delicata</i>	3
Black Guillemot	<i>Cepphus grylle</i>	2
Pine Grosbeak	<i>Pinicola enucleator</i>	2
Sharp-Shinned Hawk	<i>Accipiter striatus</i>	1
Greater Black-Backed Gull	<i>Larus marinus</i>	1
Glaucous Gull	<i>Larus hyperboreus</i>	1
Savannah Sparrow	<i>Passerculus sandwichensis</i>	1
Common Loon	<i>Gavia immer</i>	1
Greater Yellowlegs	<i>Tringa melanoleuca</i>	1
Hermit Thrush	<i>Catharus guttatus</i>	1

3.2.2.2 2023 Survey Results

Spring Migration

Spring 2023 (May 7-May 25) weekly surveys resulted in the observation of 41 bird species, with a focus on the Argentia Backlands (where the turbines are proposed to be located). The most detected birds were the White-throated Sparrow, American Robin, Yellow-rumped Warbler, Fox Sparrow, and Wilson's Snipe. Of note was one observation of the Red Crossbill *percna*, which is listed as Threatened both provincially and federally. Bird survey totals were a sum of observations based on point counts and atlassing transects (Table D1-3.2.2-1).

Table D1-3.2.2-1 Spring Bird Survey Totals, 2023.

Spring Bird Survey Totals, May 7 – May 25, 2023		
Species Common Name	Latin Name	Count of Species
White-throated Sparrow	<i>Zonotrichia albicollis</i>	76
American Robin	<i>Turdus migratorius</i>	63
Yellow-rumped Warbler	<i>Setophaga coronata</i>	41
Fox Sparrow	<i>Passerella iliaca</i>	35
Wilson's Snipe	<i>Gallinago delicata</i>	35
Hermit Thrush	<i>Catharus guttatus</i>	31
Dark-eyed Junco	<i>Junco hyemalis</i>	28
Northern Waterthrush	<i>Parkesia noveboracensis</i>	27

Spring Bird Survey Totals, May 7 – May 25, 2023		
Species Common Name	Latin Name	Count of Species
Northern Flicker	<i>Colaptes auratus</i>	24
Ruby-crowned Kinglet	<i>Regulus calendula</i>	19
Boreal Chickadee	<i>Poecile hudsonicus</i>	18
American Crow	<i>Corvus brachyrhynchos</i>	17
Ruffed Grouse	<i>Bonasa umbellus</i>	16
Blackpoll Warbler	<i>Setophaga striata</i>	12
Blue Jay	<i>Cyanocitta cristata</i>	9
Common Raven	<i>Corvus corax</i>	8
Black-capped Chickadee	<i>Poecile atricapillus</i>	7
Savannah Sparrow	<i>Passerculus sandwichensis</i>	6
Purple Finch	<i>Haemorhous purpureus</i>	6
Herring Gull	<i>Larus argentatus</i>	6
Gull spp.	<i>Larus spp.</i>	6
Black and White Warbler	<i>Mniotilta varia</i>	5
Gray Jay	<i>Perisoreus canadensis</i>	5
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	4
Pine Grosbeak	<i>Pinicola enucleator</i>	4
Common Loon	<i>Gavia immer</i>	4
Bald Eagle	<i>Haliaeetus leucocephalus</i>	3
Common Tern	<i>Sterna hirundo</i>	3
Woodpecker Spp.	<i>Picidae spp.</i>	2
Wilson's Warbler	<i>Cardellina pusilla</i>	2
Black-backed Woodpecker	<i>Picoides arcticus</i>	2
Golden-crowned Kinglet	<i>Regulus satrapa</i>	2
Greater Yellowlegs	<i>Tringa melanoleuca</i>	2
American Goldfinch	<i>Spinus tristis</i>	1
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	1
Pine Siskin	<i>Spinus pinus</i>	1
Swamp Sparrow	<i>Melospiza georgiana</i>	1
Blue-headed Vireo	<i>Vireo solitarius</i>	1
Brown Creeper	<i>Certhia americana</i>	1
Northern Harrier	<i>Circus hudsonius</i>	1
White-winged Crossbill	<i>Loxia leucoptera</i>	1

In spring 2023, the heights of birds observed in the Project Area were recorded, as different ecological niches may interact differently with the Project infrastructure. Most Passeriformes and Other Perching Birds were observed at 0-15 m high, which is typical for this group, as they tend to use the vertical structure associated with forest, shrubs, and the ground for foraging. Raptors were observed in the higher

height categories, but the sample size was very small (n=3). Waterfowl were observed most often in the 60-100 m category (Table D1-3.2.2-2).

Table D1-3.2.2-2 Bird Observation Heights by Bird Group, Spring 2023.

Bird Group	Height of Observation	Percentage of Observations at Height (%)	Number of Observations
Passeriformes and Other Perching Birds	Unknown	8.70	40
	0-15 m	85.30	391
	15-30 m	0.90	4
	30-60 m	2.60	12
	60-100 m	2.60	12
	100+ m	0	0
Raptors	Unknown	0	0
	0-15 m	33.30	1
	15-30 m	0	0
	30-60 m	0	0
	60-100 m	33.30	1
	100+ m	33.30	1
Waterfowl and Waterbirds	Unknown	8.77	5
	0-15 m	47.37	27
	15-30 m	7.02	4
	30-60 m	7.02	4
	60-100 m	28.07	16
	100+ m	1.75	1
Seabirds	Unknown	33.30	5
	0-15 m	20.00	3
	15-30 m	0	0
	30-60 m	0	0
	60-100 m	33.30	5
	100+ m	13.30	2

Breeding Season

Bird surveys conducted during the breeding season of 2023 resulted in the observation of 38 different bird species, mostly terrestrial species in the Argentia Backlands (where turbines are proposed). The most detected species were Northern Waterthrush, Blackpoll Warbler, White-throated Sparrow, Yellow-bellied Flycatcher, and Fox Sparrow. Of note were four observations of Red Crossbill *percna*, a SAR listed as Threatened provincially and federally. Breeding season bird observation data is presented in Table D1-3.2.2-3.

Table D1-3.2.2-3 Breeding Season Bird Survey Totals, 2023.

Breeding Season Bird Survey Totals, June 7 – June 27, 2023		
Species Common Name	Latin Name	Count of Species
Northern Waterthrush	<i>Parkesia noveboracensis</i>	118
Blackpoll Warbler	<i>Setophaga striata</i>	103
White-throated Sparrow	<i>Zonotrichia albicollis</i>	97
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	73
Fox Sparrow	<i>Passerella iliaca</i>	60
American Robin	<i>Turdus migratorius</i>	47
Hermit Thrush	<i>Catharus guttatus</i>	37
Black-and-white Warbler	<i>Mniotilta varia</i>	29
Yellow-rumped Warbler	<i>Setophaga coronata</i>	27
Wilson's Snipe	<i>Gallinago delicata</i>	25
Ruby-crowned Kinglet	<i>Regulus calendula</i>	24
Dark-eyed Junco	<i>Junco hyemalis</i>	24
Boreal Chickadee	<i>Poecile hudsonicus</i>	19
Swamp Sparrow	<i>Melospiza georgiana</i>	9
Black-capped Chickadee	<i>Poecile atricapillus</i>	7
Blue Jay	<i>Cyanocitta cristata</i>	7
American Crow	<i>Corvus brachyrhynchos</i>	6
Canada Jay	<i>Perisoreus canadensis</i>	5
Ruffed Grouse	<i>Bonasa umbellus</i>	5
Common Yellowthroat	<i>Geothlypis trichas</i>	4
Red Crossbill <i>percna</i>	<i>Loxia curvirostra percna</i>	4
Gull species	<i>Larus spp.</i>	4
Common Raven	<i>Corvus corax</i>	3
Downy Woodpecker	<i>Picoides pubescens</i>	3
Wilson's Warbler	<i>Cardellina pusilla</i>	3
Swainson's Thrush	<i>Catharus ustulatus</i>	3
Black-throated Green Warbler	<i>Setophaga virens</i>	3
Northern Flicker	<i>Colaptes auratus</i>	3
Gray-cheeked Thrush	<i>Catharus minimus</i>	3
Common Loon	<i>Gavia immer</i>	2
Magnolia Warbler	<i>Setophaga magnolia</i>	1
Blue-headed Vireo	<i>Vireo solitarius</i>	1
Sharp-shinned Hawk	<i>Accipiter striatus</i>	1
Black-backed Woodpecker	<i>Picoides arcticus</i>	1
Golden-crowned Kinglet	<i>Regulus satrapa</i>	1
Palm Warbler	<i>Setophaga palmarum</i>	1
Tree Swallow	<i>Tachycineta bicolor</i>	1
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	1

Fall Migration

Fall 2023 surveys resulted in the observation of 37 different bird species. The most detected bird species during this season were the White-winged Crossbill, Pine Siskin, Boreal Chickadee, Black-capped Chickadee, and American Robin. Twenty-six observations of Red Crossbill *percna* were recorded, the only SAR observed. Fall bird survey totals are presented in Table D1-3.2.2-4 below.

Table D1-3.2.2-4 Fall Migration Bird Survey Totals, 2023.

Fall Bird Survey Totals, September 26, 2023 – January 3, 2024		
Species Common Name	Latin Name	Count of Species
White-winged Crossbill	<i>Loxia leucoptera</i>	227
Pine Siskin	<i>Pinus spinus</i>	185
Boreal Chickadee	<i>Poecile hudsonicus</i>	70
Black-capped Chickadee	<i>Poecile atricapillus</i>	34
American Robin	<i>Turdus migratorius</i>	27
American Crow	<i>Corvus brachyrhynchos</i>	27
Red Crossbill <i>percna</i>	<i>Loxia curvisrostra percna</i>	26
American Goldfinch	<i>Spinus tristis</i>	25
Golden-crowned kinglet	<i>Regulus satrapa</i>	23
Northern Flicker	<i>Colaptes auratus</i>	18
Dark-eyed Junco	<i>Junco hyemalis</i>	18
Black Scoter	<i>Melanitta americana</i>	16
Common Raven	<i>Corvus corax</i>	11
Blue Jay	<i>Cyanocitta cristata</i>	10
Canada Jay	<i>Perisoreus canadensis</i>	10
Common Redpoll	<i>Acanthis flammea</i>	9
Savannah Sparrow	<i>Passerculus sandwichensis</i>	6
White-throated Sparrow	<i>Zonotrichia albicollis</i>	5
Wilson's Snipe	<i>Gallinago delicata</i>	4
Ruffed Grouse	<i>Bonasa umbellus</i>	4
Sharp-shinned Hawk	<i>Accipiter striatus</i>	2
Yellow-rumped Warbler	<i>Setophaga coronata</i>	3
Swamp Sparrow	<i>Melospiza georgiana</i>	3
Purple Finch	<i>Haemorhous purpureus</i>	2
Duck spp.	<i>Anas</i> spp.	2
American Black Duck	<i>Anas rubripes</i>	2
Downy Woodpecker	<i>Picoides pubescens</i>	2
Fox Sparrow	<i>Passerella iliaca</i>	2
Pine Grosbeak	<i>Pinicola enucleator</i>	2
Red-breasted Nuthatch	<i>Sitta canadensis</i>	1
Tennessee Warbler	<i>Leiothlypis peregrina</i>	1

Fall Bird Survey Totals, September 26, 2023 – January 3, 2024		
Species Common Name	Latin Name	Count of Species
Common Loon	<i>Gavia immer</i>	1
Hermit Thrush	<i>Catharus guttatus</i>	1
Song Sparrow	<i>Melospiza melodia</i>	1
Blue-headed Vireo	<i>Vireo solitarius</i>	1
Merlin	<i>Falco columbarius</i>	1
Northern Goshawk	<i>Accipiter gentilis</i>	1

Ninety-five percent of birds observed in the fall were Passeriformes and Other Perching Birds. Table D1-3.2.2-5 lists the heights of observations.

Table D1-3.2.2-5 Bird Observation Heights by Bird Group, Fall 2023.

Bird Group	Height of Observation	Percentage of Observations at Height
Passeriformes and Other Perching Birds	0-15 m	31.81%
	15-30 m	52.67%
	30-60 m	7.38%
	Unknown	8.14%
Raptors	0-15 m	50.00%
	15-30 m	25.00%
	30-60 m	25.00%
	Unknown	0.00%
Waterfowl and Water Birds	0-15 m	76.47%
	15-30 m	23.53%
	30-60 m	0.00%
	Unknown	0.00%

3.3 Species at Risk

Red Crossbill *percna*

The Red Crossbill *percna* subspecies is listed as Threatened under the NL ESA and the SARA. This subspecies was once listed as Endangered but was downlisted in 2016 (COSEWIC, 2016). Red Crossbill *percna* was thought to be endemic to Newfoundland until recently, when it was observed on Anticosti Island in Quebec (COSEWIC, 2016). Red Crossbill *percna* inhabit and rely on coniferous forests as a main source of food, as they are specially adapted to eat cone-obligate seeds (COSEWIC, 2016).

The Red Crossbill *percna* was observed in the Project Area during fall surveys in 2022 (11 detections) and 2023 (27 detections), see Figure D1-3.3-1. In addition, there were a total of 420 identifications from

the two SongMeters (SongMeter 1: 368 detections over 166 days of deployment; SongMeter 2: 52 detections over 155 days of deployment). Only four detections occurred during breeding season surveys. A map of Red Crossbill *percna* observation sites and suitable habitat is presented in Figure D1-3.3-2. Habitat suitability, as for all the SAR, was derived from the Ecological Land Classification (ELC) (Appendix D3).



Figure D1-3.3-1 Red Crossbill *percna* male in the Project Area, December 2023.

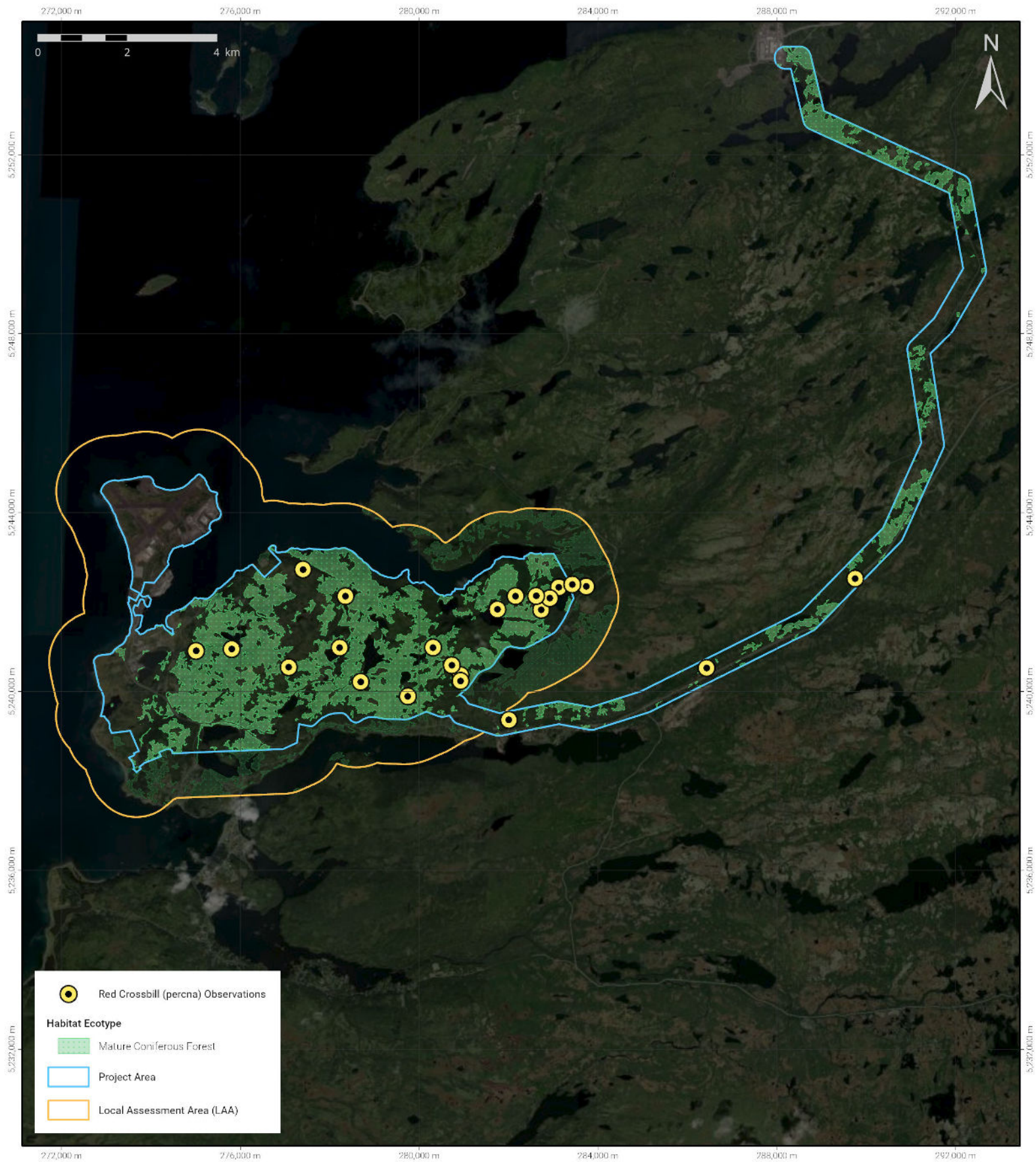


	FIGURE NUMBER: D1 - 3.3 - 2	COORDINATE SYSTEM: NAD 1983 CSRS UTM Zone 22N	PREPARED BY: C. Burke	DATE: 24/07/26
	FIGURE TITLE: Red Crossbill <i>percna</i> Observations and Suitable Habitat	NOTES:	REVIEWED BY:	
	PROJECT TITLE: Argentia Renewables		APPROVED BY:	

Evening Grosbeak

Evening Grosbeak was observed twice (by sound) at sites near the yellow birch Mixedwood Forests in the northern section of the Argentia Backlands. Evening Grosbeak breed in mature to old coniferous forests and mixedwood forests across Canada (ECCC, 2022). They are listed as Special Concern on the SARA and are listed as Vulnerable on the NL ESA.

Gray-cheeked Thrush

Gray-cheeked Thrush *minimus* subspecies (*Catharus minimus minimus*) is a Newfoundland subspecies listed as Vulnerable under the NL ESA. This subspecies was designated as Threatened by COSEWIC in 2023 (COSEWIC, 2023); however, the subspecies is not currently listed on the SARA. Gray-cheeked Thrush in Newfoundland prefers windswept coastal conifer thickets, conifer scrub, and regenerating clearcuts of balsam fir (*Abies balsamea*) (Dalley *et al.*, 2005). Suitable habitat exists in the Project Area in the form of Regenerating Coniferous Forest thickets throughout the Backlands, and coastal windswept Coniferous Scrub along the Argentia Peninsula.

The low abundance of this species in Newfoundland appears to correlate inversely with the abundance of red squirrel (*Tamiasciurus hudsonicus*) (Dalley *et al.*, 2005), which were observed often during bird surveys. However, three observations of Gray-cheeked Thrush were recorded during the breeding bird surveys (all three were songs, on June 8, 15, and 18, 2023). Interestingly, all three observations were at elevations ≤ 100 m, which contrasts with recent research indicating that the species is now essentially absent below 350 m (Robineau-Charette *et al.*, 2023).

Short-eared Owl

The Short-eared Owl is classified as Vulnerable under the NL ESA and is listed as Special Concern on SARA Schedule 1. Minimal habitat exists for the Short-eared Owl in the Project Area, aside from the wetland complexes, which are marginal due to their saturation levels. The brownfield sections of the Project Area (on the Argentia Peninsula) may provide habitat suitable for foraging and nesting, as well as some areas of the Backlands.

While no observations of the Short-eared Owl were recorded during the surveys in the Project Area, AC CDC records indicate that this species has been observed on the Argentia Peninsula. Surveys in mid-July 2024 have not produced any observations of this species. Another survey will be conducted in early August on the peninsula and within appropriate habitats of the Backlands.

Harlequin Duck

Harlequin Duck spends most of the year in coastal waters before heading inland along fast-flowing streams to breed on the shorelines of turbulent waters (Environment Canada, 2007). Breeding habitat does exist within the Project Area for Harlequin Duck, and the coastal habitat adjacent to the Project Area (within the LAA) may be suitable wintering habitat. The species is generally known to use Placentia Bay outside of breeding season. One record from Argentia in 1974 was listed in the AC CDC query. Harlequin Duck was not observed during any bird surveys at any time of year.

4.0 Discussion

Bird surveys were conducted year-round throughout the Project Area, and to some extent the Local Assessment Area (i.e., the marine environment and coastline). In addition, SongMeters were deployed from April to October, 2023. The suite of species detected was consistent with expectations for this area from other data, range maps, and experience conducting surveys in the region. Most of the species detected were Passeriformes, a result that was anticipated given that efforts focused on the Argentia Backlands (where the proposed turbines would be located).

Three SAR birds were observed from surveys, Red Crossbill *percna*, a Mature Coniferous Forest specialist, Gray-cheeked Thrush, a specialist of Scrub and/or thick young forest, and Evening Grosbeak, a highly irruptive species that breeds in Mature Coniferous Forest or mature Mixedwood Forest habitats.

Argentia Renewables is a steward of bird conservation and is committed to a robust Species at Risk Impacts Mitigation and Monitoring Plan (SAR IMMP) (note: this document is a draft and requires approval by NL WD) (Appendix R) and a comprehensive Post Construction Monitoring Plan (PCMP) (Appendix S). Bird surveys will continue throughout 2024, in addition to the surveys planned for the SAR IMMP and PCMP.

5.0 References

- Birds Canada. (2023). *Newfoundland breeding bird atlas*. [Newfoundland Breeding Bird Atlas](#)
- Committee on the Status of Endangered Wildlife in Canada. (2016). *COSEWIC assessment and status report on the Red Crossbill perca subspecies (Loxia curvirostra perca) in Canada*. Environment and Climate Change Canada. https://wildlife-species.az.ec.gc.ca/species-risk-registry/virtual_sara/files//cosewic/sr_Red%20Crossbill%20perca%20subspecies_2016_e.pdf
- Committee on the Status of Endangered Wildlife in Canada. (2023). *COSEWIC wildlife species assessments (detailed version), December 2023*. <https://www.cosewic.ca/images/cosewic/pdf/2023-wildlife-species-assessments-detailed-dec-en.pdf>
- Dalley, K., Powell, K., & Whitaker, D. (2005). *The status of gray-cheeked thrush (Catharus minimus) in Newfoundland and Labrador*. N.L. Fisheries, Forestry, and Agriculture. <https://www.gov.nl.ca/ffa/files/wildlife-endangeredspecies-ssac-gray-cheeked-thrush-2005-ssac.pdf>
- Endangered Species Act (SNL 2001, c. E-10.1). <https://www.assembly.nl.ca/legislation/sr/statutes/e10-1.htm>
- Environment and Climate Change Canada. (2022). Management plan for the evening grosbeak (Coccothraustes vespertinus) in Canada. https://wildlife-species.az.ec.gc.ca/species-risk-registry/virtual_sara/files//plans/mp_evening_grosbeak_e_final.pdf
- Environment and Climate Change Canada. (2023). *Breeding bird survey instructions*. <https://www.canada.ca/en/environment-climate-change/services/bird-surveys/landbird/north-american-breeding/instructions.html>
- Environment Canada. (2007). *Management plan for the harlequin duck (Histrionicus histrionicus) Eastern population, in Atlantic Canada and Québec*. https://wildlife-species.az.ec.gc.ca/species-risk-registry/virtual_sara/files//plans/mp_harlequin_duck_final_0507_e.pdf
- IUCN Species Survival Commission. (2012). *IUCN red list categories and criteria* (2nd ed.) International Union for the Conservation of Nature. <https://portals.iucn.org/library/sites/library/files/documents/RL-2001-001-2nd.pdf>

Migratory Birds Convention Act (S.C. 1994, c. 22). <https://laws-lois.justice.gc.ca/eng/acts/m-7.01/>

Migratory Birds Regulations (SOR/2022-105). <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-105/index.html>

Robineau-Charette, G., Whitaker, D.M., & Warkentin, I.G. (2023). Change in altitudinal distribution of Newfoundland gray-cheeked thrush (*Catharus minimus minimus*) revealed through historical stop-level breeding bird survey data. *Journal of Field Ornithology*, 94(1).
<https://doi.org/10.5751/JFO-00210-940104>

Species at Risk Act (S.C. 2002, c. 29). <https://laws.justice.gc.ca/eng/acts/s-15.3/page-10.html>

Appendix D1.1
Legislative and Organizational Species at Risk
Classifications

The NL ESA provides special protection for plant and animal species considered to be Endangered, Threatened, or Vulnerable. This legislation applies to species, sub-species and populations that are native to Newfoundland and Labrador but does not include marine fish, bacteria, and viruses. Designation under the Act follows recommendations from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or the Species Status Advisory Committee (SSAC) on the appropriate assessment of a species. Classifications of the NL ESA are outlined below.

NL ESA Classifications

Classification	Description
Extinct	No longer exists.
Extirpated	No longer exists in the wild, but exists elsewhere (e.g., exists in another province, a zoo, or a botanical garden).
Endangered	Faces imminent extirpation or extinction. For example, taxon in this category can have a declining total population size, a very small population (<250 mature individuals), an area of occupancy of less than 500 km ² , and/or occur at five or less locations. Without intervention, this taxon is likely to become Extirpated from the province.
Threatened	Is likely to become endangered if nothing is done to reverse the factors limiting its survival. For example, taxon in this category can have a declining total population size, a very small population (<1000 mature individuals), an area of occupancy of less than 2000 km ² , and/or occur at 10 or less locations.
Vulnerable	Has characteristics which make it particularly sensitive to human activities or natural events such as susceptibility to catastrophic events (e.g., oil spill) or restricted habitat or food requirements that are themselves under threat. This category may also be used to identify a wildlife species that has recovered from Threatened or Endangered status, but which is not yet secure. Species in this category are likely to become threatened or endangered if not managed effectively.
Data Deficient	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. Listing in this category indicates that more information is required, and future research may show another classification is appropriate.
Not At Risk	Generally applied to widespread and abundant taxa unlikely to fit the criteria for Vulnerable, Threatened or Endangered in the near future.

The **Species at Risk Act** (SARA) was proclaimed in June 2003, to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are Extirpated, Endangered or Threatened as a result of human activity, and to manage species of Special Concern to prevent them from becoming endangered or threatened. In addition, it complements existing laws and agreements to provide for the legal protection of wildlife species and the conservation of biological diversity. The Act aims to prevent wildlife species from becoming extinct and to secure the necessary actions for their recovery. It applies to all federal lands in Canada, all wildlife species listed as being at risk, and their critical habitat. Descriptions of SARA classifications can be found below.

SARA Classifications

Classification	Description
Extinct	A wildlife species that no longer exists
Extirpated	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild
Endangered	A wildlife species that is facing imminent Extirpation or Extinction
Threatened	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	A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that assesses the status of wildlife Species at Risk. Members are wildlife biology experts from academia, government, non-governmental organizations, and the private sector. COSEWIC designations are regarded as recommendations to the federal government, where the government makes the final decision on whether species will be listed under the SARA. Descriptions of COSEWIC classifications can be found below (COSEWIC, 2021).

COSEWIC Classifications

Classification	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 in the wild
Endangered (E)	A wildlife species that is facing imminent extirpation or extinction
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed
Special Concern	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats
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.
Not At Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

The Atlantic Canada Conservation Data Centre (AC CDC) provides provincial lists of flora and fauna and assigns a conservation status rank (S-rank) for each species in the province. The AC CDC maintains S-ranks for all terrestrial vertebrates, vascular plants, bryophytes, macrolichens and many invertebrate groups. It should be noted that S-ranks do not have any legislative protections, and for this reason are often referred to as Species of Conservation Concern (SCC), for species with S-ranks of S1 to S3. However, the AC CDC also provides the corresponding SAR information for those species that are both a SCC and SAR. AC CDC S-rank definitions are provided below.

AC CDC S-Rank Definitions

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 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 - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
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.

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species maintains a categorized list of global species of conservation concern. This database provides species' conservation status alongside robust and reliable information. The IUCN Red List is used by a wide variety of organizations, including government bodies. IUCN Red List categories are defined below (IUCN Species Survival Commission, 2012).

IUCN Red List Categories

Category	Description
Extinct (X)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.
Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat.
Not Evaluated (NE)	A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

Appendix D1.2
SongMeter 1 Monthly Acoustic Observation
Totals, 2023

Table D1.1-1 SongMeter 1 Monthly Acoustic Observation Totals, 2023.

	Apr '23	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	SPECIES TOTAL
White-throated Sparrow	38	14,611	42,918	34,736	3,507	4,604	446	100,860
Blackpoll Warbler	0	8,836	58,330	15,010	3,200	1,000	8	86,384
American Robin	77	5,855	25,496	17,744	259	408	93	49,932
Yellow-bellied Flycatcher	0	1,560	28,888	11,666	2,015	249	39	44,417
Fox Sparrow	104	4,156	12,454	11,023	813	353	15	28,918
Wilson's Snipe	62	3,996	8,313	6,228	0	0	0	18,599
Yellow-rumped Warbler	0	3,452	4,351	3,445	336	173	6	11,763
Dark-eyed Junco	0	1,411	6,379	2,034	0	0	0	9,824
Northern Waterthrush	0	988	5,834	2,210	142	0	0	9,174
Black-and-white Warbler	0	939	6,323	945	72	30	0	8,309
Hermit Thrush	11	1,646	2,469	1,375	549	778	283	7,111
Swamp Sparrow	0	1,904	2,456	1,288	36	15	0	5,699
Boreal Chickadee	32	762	2,016	1,153	23	1	5	3,992
Ruby-crowned Kinglet	30	474	2,755	188	6	9	0	3,462
Common Loon	0	109	881	1,181	193	108	39	2,511
Magnolia Warbler	0	228	1,764	276	0	0	0	2,268
Great Horned Owl	0	0	0	0	319	1,787	140	2,246
American Crow	0	90	86	43	565	781	110	1,675
Pine Grosbeak	14	121	589	276	0	0	0	1,000
White-winged Crossbill	1	22	0	0	530	117	4	674
Greater Yellowlegs	0	35	192	185	48	77	13	550
Red Crossbill	0	26	110	232	0	0	0	368
Mourning Warbler	0	5	243	20	0	0	0	268
Chickadee spp.	0	0	0	0	183	47	6	236
Northern Flicker	14	59	56	23	0	0	0	152
Winter Wren	0	13	22	51	0	0	0	86
Woodpecker spp. (drum)	8	76	0	0	0	0	0	84
Gull spp.	0	80	0	0	0	0	0	80
Black-throated Green Warbler	0	8	27	17	0	0	0	52
Golden-crowned Kinglet	0	0	0	0	19	7	6	32
Unknown	0	30	0	0	0	0	0	30
Black-capped Chickadee	0	0	0	0	11	0	1	12
Mallard Duck	0	0	0	0	1	6	0	7
Shorebird spp.	0	7	0	0	0	0	0	7
Canada Jay	0	0	0	0	1	5	0	6
MONTHLY SPECIES TOTAL	391	51,499	212,952	111,349	12,828	10,555	1,214	

Appendix D1.3
SongMeter 2 Monthly Acoustic Observation
Totals, 2023

Table D1.1-1 SongMeter 1 Monthly Acoustic Observation Totals, 2023.

	Apr '2	May '23	Jun '23	Jul '23	Aug '23	Sep '23	Oct '23	Nov '23	SPECIES TOTAL
American Robin	493	17,718	16,585	13	628	808	678	0	36,923
White-throated Sparrow	123	11,895	8,400	31	4,207	3,452	1,055	11	29,174
Blackpoll Warbler	0	6,124	7,528	24	3,144	1,604	304	0	18,728
Ruby-crowned Kinglet	1	4,208	1,500	0	0	0	0	0	5,709
Yellow-rumped Warbler	1	4,395	347	0	56	6	1	0	4,806
Fox Sparrow	266	1,568	848	1	68	221	950	7	3,929
Wilson's Snipe	277	1,720	1,791	6	0	0	0	0	3,794
Northern Waterthrush	0	607	955	0	1,595	74	50	0	3,281
Swamp Sparrow	0	1,903	857	1	0	0	0	0	2,761
Savannah Sparrow	121	1,150	677	0	0	0	0	0	1,948
Yellow-bellied Flycatcher	0	15	28	0	1,273	105	37	0	1,458
Black-and-white Warbler	0	697	217	0	34	1	0	0	949
Hermit Thrush	0	31	5	0	73	327	494	0	930
American Crow	0	248	398	4	110	64	35	0	859
Canada Jay	0	1	16	0	161	209	198	9	594
Unknown	24	473	0	0	30	41	23	0	591
Chickadee Spp.	2	69	0	0	281	94	15	5	466
Dark-eyed Junco	6	4	0	0	237	84	31	0	362
Northern Flicker	8	190	43	3	41	39	37	0	361
Boreal Chickadee	0	0	0	0	216	115	10	0	341
Spotted Sandpiper	0	90	247	0	0	0	0	0	337
White-winged Crossbill	0	0	0	0	257	53	1	0	311
Common Loon	66	218	0	0	0	0	0	0	284
Black-capped Chickadee	0	171	39	0	0	0	0	0	210
Wilson's Warbler	0	2	186	0	0	0	0	0	188
Gull Spp.	34	116	0	0	0	0	0	0	150
Yellow Warbler	0	0	125	0	0	0	0	0	125
Common Raven	0	10	92	0	0	0	0	0	102
Mallard Duck	0	0	0	0	62	15	13	0	90
Red Crossbill*	0	0	0	0	3	5	44	0	52
American Goldfinch	0	8	37	0	0	0	0	0	45
Palm Warbler	0	33	6	0	0	0	0	0	39
Golden-crowned Kinglet	0	20	6	0	0	0	0	0	26
Greater Yellowlegs	0	3	18	0	0	0	0	0	21
Great Horned Owl	0	0	0	0	0	13	2	0	15
Red-breasted Nuthatch	0	6	0	0	0	0	0	0	6
MONTHLY SPECIES TOTAL	1,422	53,693	40,951	83	12,476	7,330	3,978	32	