Appendix D4

Mammals Baseline Study

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List of Acronyms and Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
CMA	Caribou Management Area
ELC	Ecological Land Classification
GPS	Global Positioning System
LP	Limited Partnership
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador Endangered Species Act
NL WD	Newfoundland and Labrador Wildlife Division
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern

1.0 Introduction

The Mammals 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 owns both the Argentia Backlands property and the Argentia Peninsula. The two, along with a Project Interconnect Line, comprise the Argentia Renewables Project Area. This baseline study focuses on the presence/absence of mammals in the Project Area and potential interactions resulting from Project development.

Given the extensive coverage of the Project Area for rare lichens, avifauna, and Ecological Land Classification (ELC) surveys, the most effective and efficient way to compile mammal observations was on an opportunistic basis. In total, approximately 34 km of land was surveyed for mammal observations in various habitat types. In addition, an Atlantic Canada Conservation Data Centre (AC CDC) data query was submitted to determine if there were any historical records of rare or Species at Risk (SAR) fauna in the area. Zero records were returned for mammals.

Mammals from the orders Artiodactyl (split-hoofed, such as caribou and moose), Carnivora (carnivores such as foxes, coyotes, and otters), Rodentia (rodents such as beavers and voles), Insectivora (insect-eaters such as shrews), and Lagomorpha (hare forms such as rabbits and hares) were all considered during this baseline study. Note that the order Chiroptera (bats) are the subject of a bat-specific baseline study (Appendix D2) and will not be discussed in this baseline study.

2.0 Methods

2.1 Desktop Review

A comprehensive desktop review was conducted to determine the potential presence and habitat use of mammal species that may occur in the Project Area. A review was also conducted of the SAR and Species of Conservation Concern (SCC) for the Project Area through an AC CDC request. Generalized research was conducted regarding the potential effects of wind turbine operations on mammal species. In addition, local communities were consulted on the Project on several occasions, and comments and concerns were recorded pertaining to mammals and hunting in the area.

2.2 Field Surveys

Original field surveys were conducted to facilitate the confirmation of species presence in the Project Area. Numerous baseline surveys (e.g., avifauna, rare lichens, ELC) were undertaken throughout the Project Area, and incidental mammal observations were collected during each survey. Approximately 34 km of the Project Area was surveyed throughout all seasons for mammal observations in the various ecotypes of the Project Area (see Appendix D3 for the ELC). Mammal observations were also noted during other types of routine fieldwork in the Project Area (e.g., maintenance of bat detectors). This approach enabled coverage of most of the Project Area, with an emphasis on the Argentia Backlands, where most of the proposed turbines will be located. Mammal observations were compiled in the form of auditory calls, visual observations of individuals, tracks, browsing evidence, and scat. The following data was collected for each observation:

- Observation type (visual, tracks, calls, etc.);
- Date and time;
- GPS location;
- General habitat description;
- Number of individual observations; and
- Additional notes (e.g., behaviour, carrying prey, etc.).

A muskrat (*Ondatra zibethicus*) survey is being planned for fall 2024 (depending on regulatory requirements). This survey will help establish the extent to which muskrat use the Project Area. Muskrat surveys will take place in an eligible subset of ponds, which will be chosen based on habitat suitability (e.g., presence of vegetation, water depth, etc.). Further information will be provided after the study is complete. An American marten (*Martes americana atrata*) hair snag survey will be undertaken as per discussions with NL Wildlife Division (NL WD) and in following with NL WD's guidance document (Herdman, 2014). In addition, avifauna surveys conducted throughout the Project Area in 2024 will also include mammal incidentals.

3.0 Results

Eight mammal species were observed in the Project Area: moose (*Alces alces*), red fox (*Vulpes vulpes*), short-tailed weasel (*Mustela erminea*), coyote (*Canis latrans*), beaver (*Castor canadensis*), snowshoe hare (*Lepus americanus*), meadow vole (*Microtus pennsylvanicus*), masked shrew (*Sorex cinereus*), and red squirrel (*Tamiasciurus hudsonicus*). Moose and red squirrel were the most frequently observed species.

The Project may interact with mammal species in the form of habitat fragmentation and other disturbance such as noise and light (Helldin *et al*., 2012; Scholl & Nopp-Mayr, 2021). Operational wind turbines do

not pose any identified mortality risk to mammal species (aside from bats, discussed in Appendix D2). The Project Area does not overlap with any of the four mammal species listed under the Newfoundland and Labrador **Endangered Species Act** (NL ESA). Details of the results are discussed in the sections below.

3.1 Desktop Review

A literature review into the affects of wind turbines on mammals revealed that development leads to habitat fragmentation and loss, and various other disturbances (Helldin *et al*., 2012; Scholl & Nopp-Mayr, 2021). A recent study by Tolvanen *et al*. found that several mammal species avoid wind turbine sites, leading to displacement (2023). However, other mammal species were observed to be undisturbed (Tolvanen *et al*., 2023). Other literature concludes that larger mammals, such as moose and reindeer, appear to be neutral to the presence of wind turbines (Berndt *et al*., 2021; Flydal *et al*., 2004). For reindeer, it has been found that access roads pose a greater risk of inducing avoidance behaviour near wind farms than the wind turbines themselves (Colman *et al*., 2013). However, behavioural responses to wind turbines vary between studies and appear to be species-specific. The paucity of literature on the long-term effects of wind turbine operations on mammals constitutes a knowledge gap (Helldin *et al*., 2012; Scholl & Nopp-Mayr, 2021).

The AC CDC data query yielded no reports of any rare or SAR mammals within 5 km of the center of the Project Area, and similarly, the literature search of available government documents, range maps, etc., also produced no results of rare or SAR mammals. There are currently four mammals (excluding bats) listed under the NL ESA: the American marten (*Martes americana*), the polar bear (*Ursus maritimus*), the wolverine (*Gulo gulo*), and the woodland caribou (*Rangifer tarandus caribou*) (Labrador population). While not listed under the NL ESA, the Newfoundland caribou population is listed as Special Concern under the federal **Species at Risk Act** (SARA). The northern extent of the Cape Shore Caribou Management Area (CMA 77) begins at the intersection of Route 100 and Route 91, it follows along Route 91 until the intersection with Route 92 where it and continues south to Branch and completes the loop following Route 100 to the point of commencement. The Project Area, while relatively close to CMA 77, is outside of the caribou's historical range and does not contain much high-quality caribou habitat (Weir *et al*., 2014). Therefore, caribou were not considered to be of any significant concern for the Project. Similarly, at the start of this baseline study the Project Area was outside of the historic range of American marten subspecies (*Martes americana atrata*) and all other SAR mammals for the province, and thus these mammals were not considered further. However, since then, the American marten distribution has been expanded to include the Project Area with a 10-60% probability of occurrence (Hearn and Durocher, 2023). Therefore, additional surveys will be conducted in fall 2024 to assess their presence or absence in the Project Area.

The Project Area was deemed to have suitable habitat for the following mammals:

- Moose (*Alces alces*);
- Lynx (*Lynx canadensis*);
- Red Fox (*Vulpes vulpes*);
- Coyote (*Canis latrans*);
- Ermine (*Mustela erminea*);
- Mink (*Neovison vison*);
- Otter (*Lontra canadensis*);
- Beaver (*Castor canadensis*);
- Muskrat (*Ondatra zibethicus*);
- Meadow Vole (*Microtus pennsylvanicus*);
- Red-backed Vole (*Myodes gapperi*);
- Red Squirrel (*Tamiasciurus hudsonicus*);
- Deer Mouse (*Peromyscus maniculatus*);
- Norway Rat (*Rattus norvegicus*);
- House Mouse (*Mus musculus*);
- American Marten (*Martes americana atrata*)
- Snowshoe Hare (*Lepus americanus*); and
- Masked Shrew (*Sorex cinereus*).

However, three of these are unlikely given the wild natural environments (i.e., American marten, house mouse, Norway rat), except for some potential habitat on the Argentia Peninsula.

3.2 Field Studies

Baseline surveys and other fieldwork conducted throughout the Project Area yielded observations of nine different mammal species. Table D4-3.2-1 below lists the mammals that were observed in the Project Area, and observation types. Most mammal observations were recorded while performing transects and point counts for avifauna and rare lichens, and during ELC ground-truthing surveys. Additional incidentals were recorded while moving through the Project Area for routine tasks such as maintaining bat detectors.

The most successful observation period for mammals was during surveys conducted shortly after snowfall. The snow preserved tracks well and allowed for many mammal track observations.

Table D4-3.2-1 Mammal Observations in the Project Area.

Species	Latin Name	Visual	Tracks	Other
Moose	*Alces alces*	Yes	Yes	Droppings and shed antlers
Red Fox	*Vulpes vulpes*	Yes	Yes	droppings
Short-tailed Weasel	*Mustela erminea*	Yes	Yes	-
Coyote	*Canis latrans*	-	Yes	-
Beaver	*Castor canadensis*	-	-	Chewed branches and dam building
Snowshoe Hare	*Lepus americanus*	Yes	Yes	Droppings
Meadow Vole	*Microtus pennsylvanicus*	-	Yes	-
Masked Shrew	*Sorex cinereus*	Yes	Yes	-
Red Squirrel	*Tamiasciurus hudsonicus*	Yes	Yes	Nests, calls

Moose and red squirrel were the most observed species. Scat and feeding evidence for these species are conspicuous, and these are relatively ubiquitous species in natural environments in NL. Species that are very likely using the Project Area, but which were not detected during surveys, include lynx, mink, otter, muskrat, red-backed vole, and deer mouse. Some of these species would require dedicated surveys to establish presence/absence or any measure of relative abundance.

4.0 Discussion

In addition to the eight mammal species observed, it is expected that otter, muskrat, and mink live in the streams, ponds and river habitats present in the Project Area. There is also a high probability that the Canada lynx utilizes the Project Area. However, no observations of these species were made in the 2022 and 2023 surveys. The high abundance of moose can be explained by the large quantity of open wetlands and regenerating young balsam fir. Many of these young fir patches were heavily browsed by moose. Moose observations were recorded in most regions of the Project Area, excluding the Argentia Peninsula, where no mammal observations were recorded.

The mammals identified in this baseline study are likely to interact with one or more elements of the Project. The construction and maintenance of roads and turbine pads throughout the Argentia Backlands will create disturbance and habitat fragmentation (Helldin *et al*., 2012; Scholl & Nopp-Mayr, 2021). The long-term effects of wind turbine developments on mammal species are not well-studied (Helldin *et al*., 2012; Scholl & Nopp-Mayr, 2021) but aside from the fragmentation and avoidance behaviour associated with the Construction Phase, and potential avoidance of turbines during Operation and Maintenance, the interactions with mammals may be relatively minimal.

Through consultations with the NL WD, Argentia Renewables has been made aware of concern for declining muskrat populations in the province. Biologists sought observations of muskrat, particularly in the Wetland ecotype, but no observations of muskrat or muskrat evidence (e.g., scat, tracks) were

recorded. Surveys are planned for the fall of 2024 to help establish the extent to which muskrat uses the Project Area.

Also, through consultations with the NL WD, Argentia Renewables has been made aware of recent changes to the American Marten distribution in the province. Surveys are planned for the fall of 2024 to help establish the extent to which American Marten uses the Project Area. The project will adhere to the methodology provided by the NL WD.

5.0 References

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