Appendix D7

Insects Baseline Study

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List of Acronyms and Abbreviations

Abbreviations	Definitions
AC CDC	Atlantic Canada Conservation Data Center
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ELC	Ecological Land Classifications
NL ESA	Newfoundland and Labrador Endangered Species Act
SARA	Species at Risk Act

1.0 Introduction

The Insect 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 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 any insect Species at Risk (SAR) in the Project Area and potential interactions resulting from Project development.

There are three insect SAR whose range includes Newfoundland: the yellow-banded bumble bee (*Bombus terricola*), gypsy cuckoo bumble bee (*Bombus bohemicus*), and the transverse lady beetle (*Coccinella transversoguttata*). The yellow-banded bumble bee and transverse lady beetle were listed as vulnerable under the Newfoundland and Labrador **Endangered Species Act** (NL ESA) in 2022. The yellow-banded bumble bee and transverse lady beetle are listed as Special Concern under the federal **Species at Risk Act** (SARA), while the gypsy cuckoo bumble bee is listed as Endangered. Insect SAR observations were recorded during all baseline field studies (e.g., rare lichens, avifauna). The yellow-banded bumble bee was the only insect SAR recorded, with two observations in 2023.

2.0 Methods

2.1 Desktop Review

A comprehensive literature review was conducted to determine the potential presence of insect SAR in the Project Area. Historical information about the presence of these species in Newfoundland and the Project Area was reviewed, along with contemporary information about species range and observations. Background information was also collected on the habitat preference and lifestyle of each species as well as a general assessment of potential interactions with wind turbine operations.

An Atlantic Canada Conservation Data Centre (AC CDC) request was submitted for reports of insect SAR within a 5 km radius of the Project Area. Habitat suitability within the Project Area was also examined, based on the Ecological Land Classification (ELC) (Appendix D3).

2.2 Field Studies

Insect surveys were conducted concurrently with avifauna, rare lichens, and ELC surveys throughout the Project Area, and within myriad habitat types, some of which had potential for the presence of insect SAR. In particular, the Meadow and Wetland ecotypes had heightened potential for the insect SAR that were possible for this region.

For each insect SAR observation, the following data was recorded:

- Date and time;
- Weather data;
- GPS location;
- General habitat description and host plant/flower;
- Number of individuals;
- Worker, Queen, or Male (Bombus spp. only); and
- Additional notes.

A species-specific survey for the yellow-banded bumble bee will take place in August 2024. Six locations will be surveyed: three anthropogenic sites that mimic the sites to be created by the Project (e.g., roadsides and other disturbed areas), and three naturalized sites that represent native habitat (e.g., wetlands, upland barrens, meadows). The surveyor will be trained in insect identification and will observe each site for 45 minutes. Sites will be surveyed a minimum of one time each. All bee species will be recorded as per the observation data list above. The yellow-banded bumble bee survey will provide valuable insight into how Project development will affect this species.

3.0 Results

3.1 Desktop Review

A comprehensive desktop review of insect SAR determined that the likelihood of the presence of any of these SAR in the Project Area was low. In addition, the AC CDC report did not contain any observations of insects of conservation concern (S-ranks of S3 to S1) within the Project Area.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) reports for the yellow-banded bumble bee, gypsy cuckoo bumble bee, and transverse lady beetle showed no recent observations of these species in the region (COSEWIC, 2014; COSEWIC, 2015; COSEWIC, 2016). The transverse lady beetle has not been observed in Newfoundland since before 1996 (COSEWIC, 2016).

The gypsy cuckoo bumble bee is rated as less likely to be present on the Avalon Peninsula, and there are no museum-collected samples from this region (COSEWIC, 2014). It was noted that the yellow-banded bumble bee is found along coastal areas, and frequently seen along the Gulf of St. Lawrence (COSEWIC, 2015). The yellow-banded bumble bee does not have many habitat-specific preferences and can be found in various habitat types, collecting pollen and nectar from a wide variety of plants (COSEWIC, 2015).

Operating wind turbines generate insect mortalities, but there has been little scientific research conducted into the interactions between insects and wind turbines (Voigt, 2021). No studies have been completed that are specific to the insect SAR targeted with this baseline study. One recent study indicated that wind turbines do not appear to affect honeybee colonies (Fourrier *et al*., 2023). However, the bee SAR studied in the Project Area are bumble bees rather than honeybees, so extrapolating these conclusions provides limited inference.

3.2 Field Surveys

There were no observations of the transverse lady beetle or the gypsy cuckoo bumble bee in the Project Area. Two observations of the yellow-banded bumble bee were made in the Project Area. The first was on June 29, 2023, in the quarry of the northwest corner of the property. This was a small worker bee flying in circles, searching for suitable flowers to forage. The second observation was on August 9, 2023, when a large, young unmated queen was seen resting and foraging on meadowsweet (*Spiraea latifolia*) in the riparian area along the southern inlet to Gull Pond (Figure D7-3.2-1).



Figure D7-3.2-1 A Young *Bombus terricola* Queen in the Project Area.

4.0 Discussion

Baseline surveys and fieldwork did not yield any observations of the gypsy cuckoo bumble bee or the transverse lady beetle in the Project Area. The desktop review also indicated that these species were not known to be present in the general region. It is reasonable to conclude that these species are likely not present in the Project Area and will not interact with the Project. However, ongoing monitoring will be conducted opportunistically, and a dedicated insect SAR survey will occur in the summer of 2024.

The yellow-banded bumble bee was the only insect SAR that was observed in the Project Area. These bumble bees are found across Canada and are ecologically important in their role as a pollinator of native plant species (COSEWIC, 2015). Yellow-banded bumble bees create their nests underground (Laverty & Harder, 1988) and can be found in a range of different habitat types (COSEWIC, 2015). Identified stressors to the yellow-banded bumble bee, such as large-scale farming and honeybee farming, are not present in the Project Area (COSEWIC, 2015).

While wind turbine operations have the potential to cause insect mortalities, there is limited knowledge on this topic (Voigt, 2021). Argentia Renewables is committed to pollinator conservation and recognizes that this Project may have some (albeit likely minimal) interaction with this SAR. As a precaution, species-specific surveys will be conducted for the yellow-banded bumble bee to improve estimates of their abundance and habitat use in the Project Area.

5.0 References

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