Appendix D7: Rare Insects Baseline Study

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Table of Contents

List of Tables

List of Figures

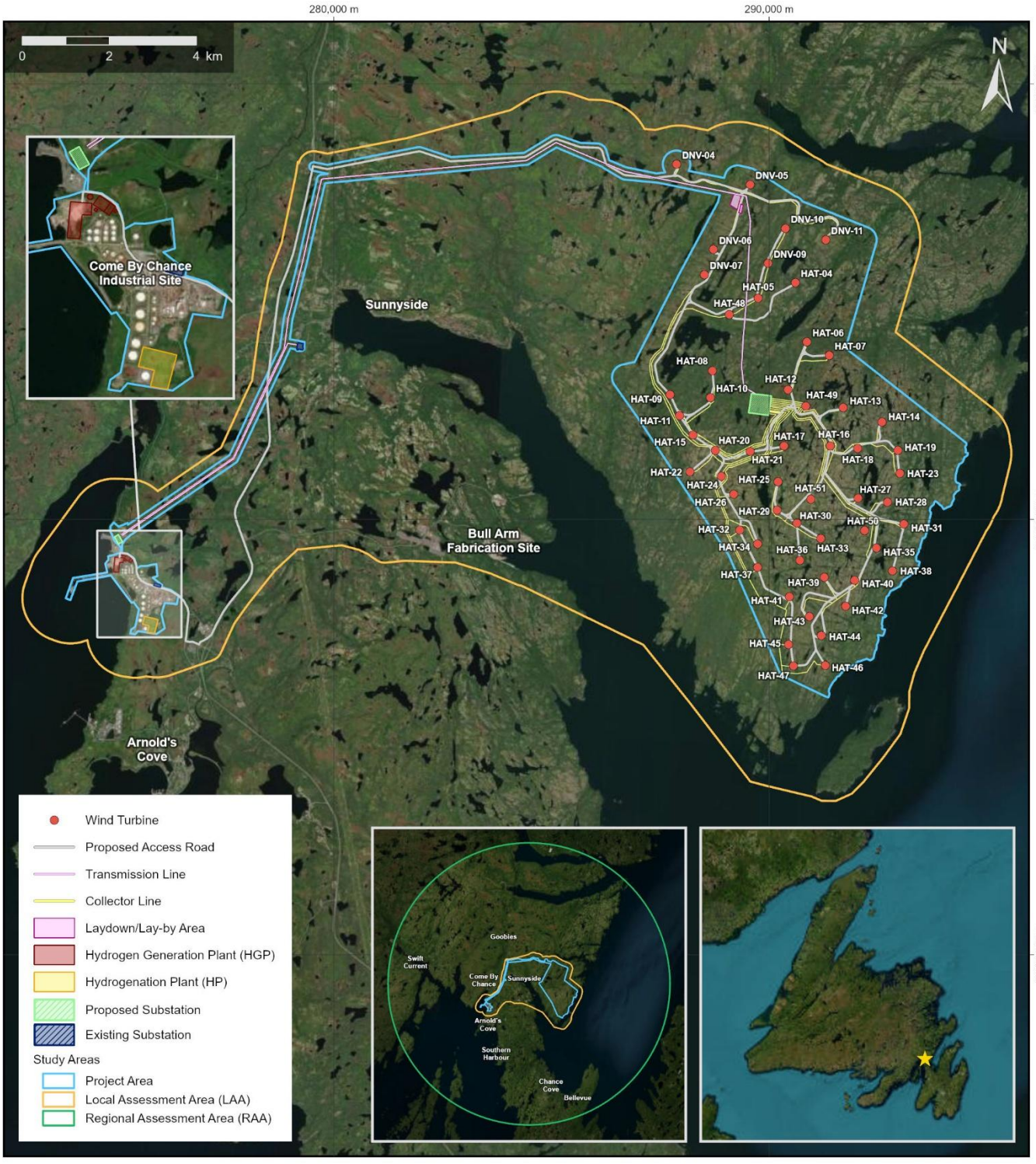
List of Acronyms and Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
GPS	Global Positioning System
HGP	Hydrogen Generation Plant
HP	Hydrogenation Plant
IUCN	International Union for Conservation of Nature
kV	kilovolts
LAA	Local Assessment Area
LOHC	Liquid Organic Hydrogen Carrier
m	meters
MW	megawatts
NL	Newfoundland and Labrador
NL ESA	Endangered Species Act (Newfoundland and Labrador)
North Atlantic	North Atlantic Refining Corp.
PA	Project Area
SAR	Species at Risk
SARA	Species at Risk Act (Federal)
SCC	Species of Conservation Concern
spp.	species
the Project	North Atlantic Wind to Hydrogen Project
UTM	Universal Transverse Mercator

1.0 Introduction

North Atlantic Refining Corp. (North Atlantic) is proposing to undertake the development of a Wind to Hydrogen project (the Project) on the Isthmus of Avalon Region in Newfoundland and Labrador (NL). This Project will entail the development, construction, operation and eventual decommissioning of a 324-megawatt (MW) Wind Farm consisting of 45 wind turbines on an undeveloped peninsula situated between Sunnyside and Deer Harbour. The Wind Farm will provide renewable electricity via a 138 kilovolt (kV) transmission line to a newly developed Hydrogen Generation Plant (HGP), from where generated hydrogen will be transported to a Hydrogenation Plant (HP) for transformation into a Liquid Organic Hydrogen Carrier (LOHC), which will then be shipped from North Atlantic's port facilities to international markets for use in various decarbonization technologies.

In support of the Project, North Atlantic has undertaken environmental baseline studies throughout the Project Area (PA). The Rare Insects Baseline Study was conducted between August and September 2024. This study included the use of desktop research and field surveys specifically designed to assess the presence/absence of insect Species at Risk (SAR) in the PA. There are four insect SAR possible for insular Newfoundland, all protected under provincial and/or federal legislation: the yellow-banded bumble bee (*Bombus terricola*), gypsy cuckoo bumble bee (*Bombus bohemicus*), Suckley's cuckoo bumble bee (*Bombus suckleyi*), and the transverse lady beetle (*Coccinella transversogutatta*). Each of these species were targeted in the Rare Insects Baseline Study. While the species range for each insect includes or is adjacent to the PA, only the yellow-banded bumble bee was expected to occur in the PA.



North Atlantic	FIGURE TITLE: Project Location Overview	NOTES: The location of proposed project infrastructure is considered preliminary and is subject to change.	PREPARED BY: C. Burke	DATE: 10/07/2025
			REVIEWED BY: C. Bursey 10/07/2025	
			APPROVED BY: C. Collins 10/07/2025	
	PROJECT TITLE: North Atlantic Wind to Hydrogen Project		CRS: WGS 1984 UTM Zone 22N	
			sem	

SEM MAP ID: 016-015-GIS-001-Rev0

Figure D7-1.0-1 Project location and preliminary infrastructure layout.

2.0 Methods

2.1 Desktop Study

A comprehensive desktop review was conducted to confirm the ranges and habitat uses of the insect SAR that may occur in the PA. This desktop study included a literature review of relevant material, like scientific articles, government reports and management plans, and open-source databases like iNaturalist. A review was also conducted of the SAR and Species of Conservation Concern (SCC) for the PA through an Atlantic Canada Conservation Data Centre (AC CDC) request. This request was made for the entire PA with a 5 km buffer which also included the Local Assessment Area (LAA) and part of the Regional Assessment Area (RAA).

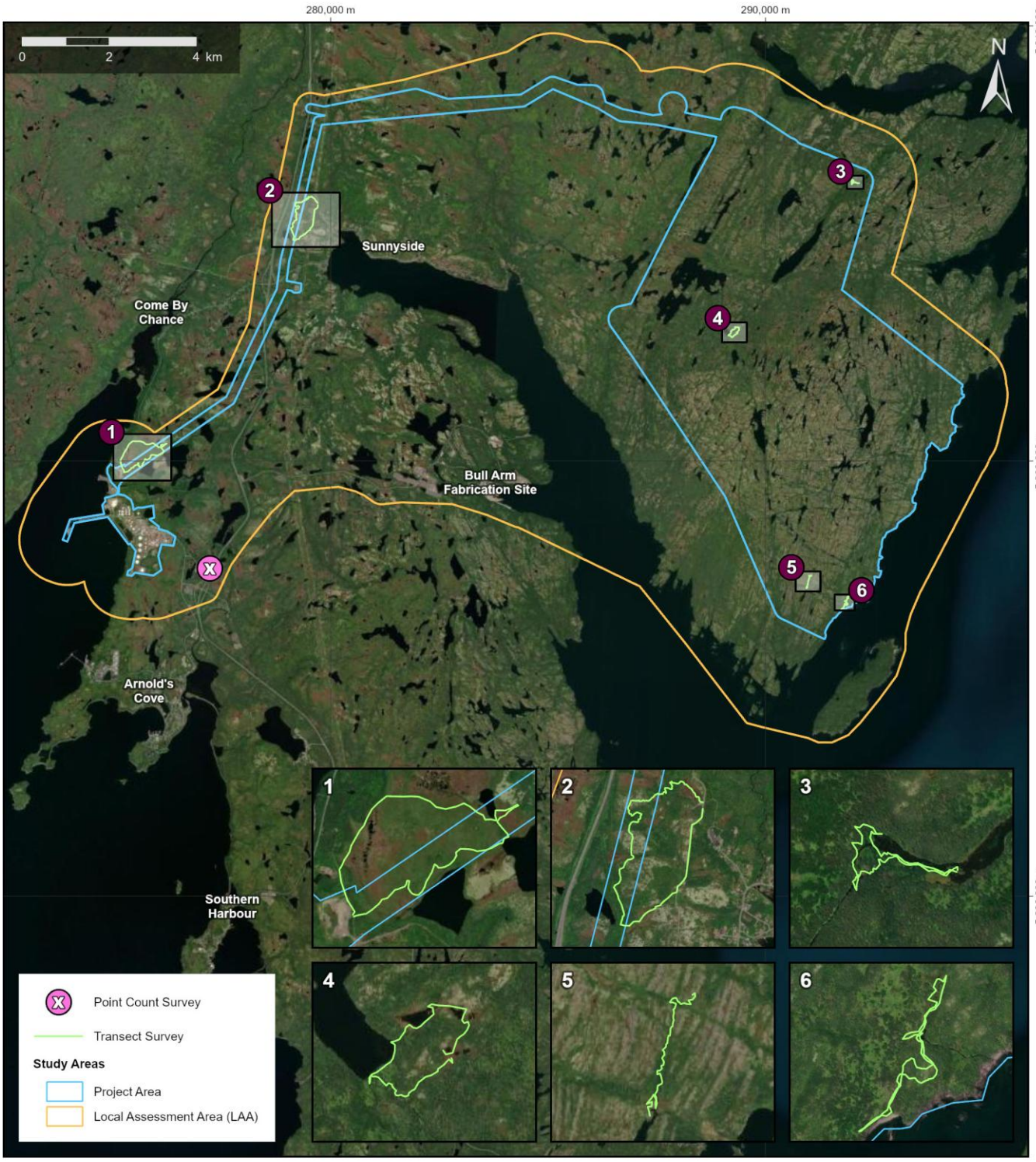
2.2 Field Surveys

Based on the desktop study findings, three species from the genus *Bombus* were determined to be the most probable SAR insects for the PA. It is considered less likely that the transverse lady beetle (*Coccinella transversoguttata*) is present in the area. Surveys were designed to observe the diversity of the *Bombus* species within the PA. This approach would also detect *Coccinella* species, due to the similarity in habitat use between the insects.

Firstly, transect-style surveys were conducted within the PA and along sections of the transmission line and access road corridor. This was conducted over three days in unison with the rare plants surveys, from August 26, 2024, to August 28, 2024. Areas with flowering plants were observed during a targeted meander; flowering plants and open air were searched for *Bombus* species, while vegetation of the flowering plants was observed for *Coccinella* species. Six (6) total sites were surveyed across the PA – a track of the route followed during each transect is presented as Figure D7-2.2-1.

Site 1 was situated along the transmission line corridor. During this transect, various habitat types were visited; however, much of this area was characterized as a poor fen (wetland). Time was spent surveying riparian areas on stream banks, along with some treed wetlands. Site 1 hosted various flowering plant species throughout.

Site 2 was also situated along transmission line corridor; however, the habitats present differed greatly from Site 1. This site was characterized by upland mature forests, small-scale anthropogenic cutovers, *Cladonia* barrens, and a meadow underneath an existing transmission line. Each of these habitats hosted a myriad of flowering plant species which would appeal to a diverse range of pollinators.



North Atlantic	FIGURE TITLE: Rare Insect Survey	NOTES: Inset maps showing detailed view of survey transects are displayed in varying map scales.	PREPARED BY: C. Burke	DATE: 12/06/2025
	PROJECT TITLE: North Atlantic Wind to Hydrogen Project		REVIEWED BY: C. Bursey 12/06/2025	
			APPROVED BY: C. Collins 12/06/2025	
			CRS: WGS 1984 UTM Zone 22N	
			sem	

SEM MAP ID: 016-015-GIS-400-Rev0

Figure D7-2.2-1 Rare insect survey areas.

Site 3 was positioned along the outlet of Deer Harbour Steady. The survey was focused on a riparian meadow and fen, most of which hosted ample flowering plants. One of the notable plants was *Spirea alba*, which is attractive to foraging *Bombus* spp.

Site 4 encompassed a large riparian meadow bordering a small stream and lake, along with two smaller pooled fens and a mature coniferous forest. The riparian meadow and pooled fens contained a healthy variety of flowering plants.

Site 5 represented the upland rocky barrens present throughout much of the PA. Although spaced out, numerous flowering plants existed in this habitat. The transect included a deep valley with a higher level of diversity and density of suitable foraging plants.

Site 6 focused on a riparian meadow influenced by a slow-flowing stream to the coast. The meadow featured various forbs, which are attractive to insect pollinators. Some time was also spent on the coast, where a fen hosted an additional set of unique flowering plants.

After the transect-style surveys throughout the PA, a 10-minute point count was conducted around the helicopter hangar for the Project, located in the LAA (UTM Zone 22 T, 277211.26 E, 5297510.86 N). This area contained abundant floral resources and was surveyed on September 11, 2024. This site was chosen to represent bumble bee use of anthropogenic areas within the LAA. Upon construction of the Project, similar roadside habitats will be present throughout the PA. However, there is currently little to no anthropogenic disturbance within the proposed Wind Farm and Linear Corridor areas. The information from this point count survey can be extrapolated to represent the eventual habitat conditions created in the PA. A 50 m radius was used as the survey boundary, and all bumble bees and lady beetles observed within the area were recorded.

In the case that a SAR was observed during a survey, the following data was to be 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.

3.0 Results

3.1 Desktop Study

The desktop review identified four provincially protected insect SAR, three of which are also protected under federal legislation. All four insects' ranges include or are directly adjacent to the PA. The below table (Table D7-3.1-1) lists the conservation status of these insects, according to the Newfoundland and Labrador **Endangered Species Act** (NL ESA), the federal **Species at Risk Act** (SARA), and the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (IUCN, 2024).

Table D7-3.1-1 Conservation status of insect Species at Risk in Newfoundland.

Common Name	Scientific Name	NL ESA	SARA	IUCN Red List
Yellow-banded bumble bee	*Bombus terricola*	Vulnerable	Special Concern	Vulnerable
Gypsy cuckoo bumble bee	*Bombus bohemicus*	Endangered	Endangered	Data Deficient
Suckley's cuckoo bumble bee	*Bombus suckleyi*	Threatened	Not Listed*	Critically Endangered
Transverse lady beetle	*Coccinella transversoguttata*	Vulnerable	Special Concern	Not Evaluated
Notes *Suckley's cuckoo bumble bee is currently under consideration for Threatened status under the SARA.				

The AC CDC data request did not yield any results for insect SAR or SCC in the PA. Further information on each species' range and habitat use is provided below.

Yellow-banded bumble bee

The yellow-banded bumble bee is native to North America and was historically one of the most common bumble bees in Canada; however, its population has been declining over the last three decades (ECCC, 2023). The Newfoundland range for this species includes the PA, and there have been both recent and historical observations in the surrounding region (ECCC, 2023; NatureServe, 2020a). This bee is a highly adaptable habitat generalist that is known to prefer open habitats (e.g., meadows, grasslands, agricultural areas) (ECCC, 2023). Similarly, it is known to collect nectar and pollen from a variety of plants (ECCC, 2023). This gives the yellow-banded bumble bee a relatively wide range of potential habitat across the island (COSEWIC, 2015).

Gypsy cuckoo bumble bee

The gypsy cuckoo bumble bee is a parasitic species that relies on the nests of other *Bombus* bees for its survival (ECCC, 2022). Its global range extends beyond North America into most of Europe and some parts of Asia (COSEWIC, 2014). In Canada, gypsy cuckoo bumble bee populations have faced a steep

decline, with only a few specimens found in three provinces since the 1990s, despite significant search efforts (COSEWIC, 2014). The last recorded evidence of the gypsy cuckoo bumble bee in Newfoundland is from 1979 (COSEWIC, 2014). Despite the lack of sightings in past decades, the potential range of the gypsy cuckoo bumble bee includes the PA, and historically it has been sighted along the western coast of the nearby Avalon Peninsula (COSEWIC, 2014). As this species mimics *Bombus* bees, it follows that it is a habitat generalist and would be typically observed in open areas (COSEWIC, 2014).

Suckley's cuckoo bumble bee

Similar to the gypsy cuckoo bumble bee, Suckley's cuckoo bumble bees are also social parasites, thought to rely primarily on the nests of yellow-banded bumble bees (COSEWIC, 2019). Suckley's cuckoo bumble bee occurs only in North America, with a Canadian range spanning from coast to coast. These bees have been experiencing population declines in eastern Canada and have not been observed in Newfoundland since 2010 (COSEWIC, 2019). Their potential range in the Province includes the PA, according to NatureServe mapping (2020b), although there have been no direct observations reported in the PA. The species shares the same habitat preferences as yellow-banded bumble bees, in that they are habitat generalists that feed on many flowering plants (COSEWIC, 2019).

Transverse lady beetle

The transverse lady beetle is native to North America and was historically abundant across Canada (COSEWIC, 2016). However, in eastern Canada and particularly in Atlantic Canada, it is experiencing a severe population decline (COSEWIC, 2016). The last scientific observation of a transverse lady beetle in the Province is from Labrador in 2014 (COSEWIC, 2016). This species' range includes the PA (NatureServe, 2020c), and anecdotal evidence places it in nearby Milton in 2023 (iNaturalist, 2023). Transverse lady beetles are habitat generalists, found in habitats ranging from natural forests to suburban gardens (COSEWIC, 2016). Their habitat use is driven by their prey, consisting mainly of aphids and other small insects (COSEWIC, 2016).

3.2 Field Surveys

The 10-minute point count study near the hangar yielded no observations of rare insects. Surveyors did make 15 observations of *Bombus vagans bolsteri* (Half-black bumble bee) or *Bombus sandersoni* (Sanderson bumble bee), foraging on either common toadflax (*Linaria vulgaris*) or fireweed (*Chamaenerion angustifolium*). These two bumble bees are not reliably differentiated in the field; thus, the observation could have been either species.

The transect-style surveys yielded no observations of any insect SAR. Some of the observed flowering plants included grass-leaved goldenrod (*Euthamia graminifolia*) three-leaved rattlesnake-root (*Nabalus*

trifoliolatus), meadow sweet (*Spiraea latifolia*), variegated pond-lily (*Nuphar variegata*), among others. On August 27, an individual *Bombus vagans bolsteri* or *Bombus sandersoni* was observed foraging on grass-leaved goldenrod at Site 2.

4.0 Discussion

The rare insect field studies did not yield any observations of the four insect SAR. However, desktop research suggests the possibility of all four species using the PA. All the insect SAR are winged and capable of flight. These species can be easily distributed and are not easily detected. They could possibly appear in the PA without any recent observations nearby. The yellow-banded bumble bee is most likely to be present in the PA as it is distributed across the entire island and has been observed most recently in nearby areas (COSEWIC, 2015; Pattern, 2024). Given that the other bumble bee SAR are known to use the nests of yellow-banded bumble bees, it follows that they may use the same areas. However, unless a direct observation is made of a parasitic bee species, they are considered to be absent in the area.

There was drastically more bumble bee activity observed at the hangar site compared to the more naturalized areas. Using the comparison between the roadside point count vs the transects, it appears that the disturbed sites on the margins of roadways are attractive to the *Bombus* genus bumble bees. Project development will result in the creation of more roadside habitat throughout the PA, at which time bumble bee populations may reflect the results of this survey.

While the possibility exists for insect SAR to inhabit the PA, until such time that they are directly observed, it is assumed that they are not present and thus will not interact with the Project. Ongoing opportunistic monitoring will be undertaken throughout the last of the baseline studies in 2025.

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