



# North Atlantic

## Appendix D6: Rare Plants Baseline Study

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## List of Acronyms and Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
cm	centimetre
FNA	Flora of North America
GPS	Global Positioning System
HGP	Hydrogen Generation Plant
HP	Hydrogenation Plant
IUCN	International Union for Conservation of Nature
km	kilometres
kV	kilovolts
LAA	Local Assessment Area
LOHC	Liquid Organic Hydrogen Carrier
m	meter
MDFW	Massachusetts Division of Fisheries and Wildlife
mm	millimetre
MW	megawatts
NARL	North Atlantic Refining Limited
NL	Newfoundland and Labrador
NL ESA	Endangered Species Act (Newfoundland and Labrador)
NL WD	Newfoundland and Labrador Wildlife Division
North Atlantic	North Atlantic Refining Corp.
PA	Project Area
RAA	Regional Assessment Area
SAR	Species at Risk
SARA	Species at Risk Act (Federal)
SCC	Species of Conservation Concern
spp.	species
SSAC	Species Status Advisory Committee
the Project	North Atlantic Wind to Hydrogen Project
UTM	Universal Transverse Mercator

# 1.0 Introduction

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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 Plants Baseline Study was conducted in August 2024. This study included the use of desktop research and field surveys conducted by botanists to identify plants throughout the PA. There is one plant Species at Risk (SAR) with the potential to persist in the PA – water pygmyweed (*Tillaea aquatica* syn. *Crassula aquatica*) – for which a species-specific survey was conducted.

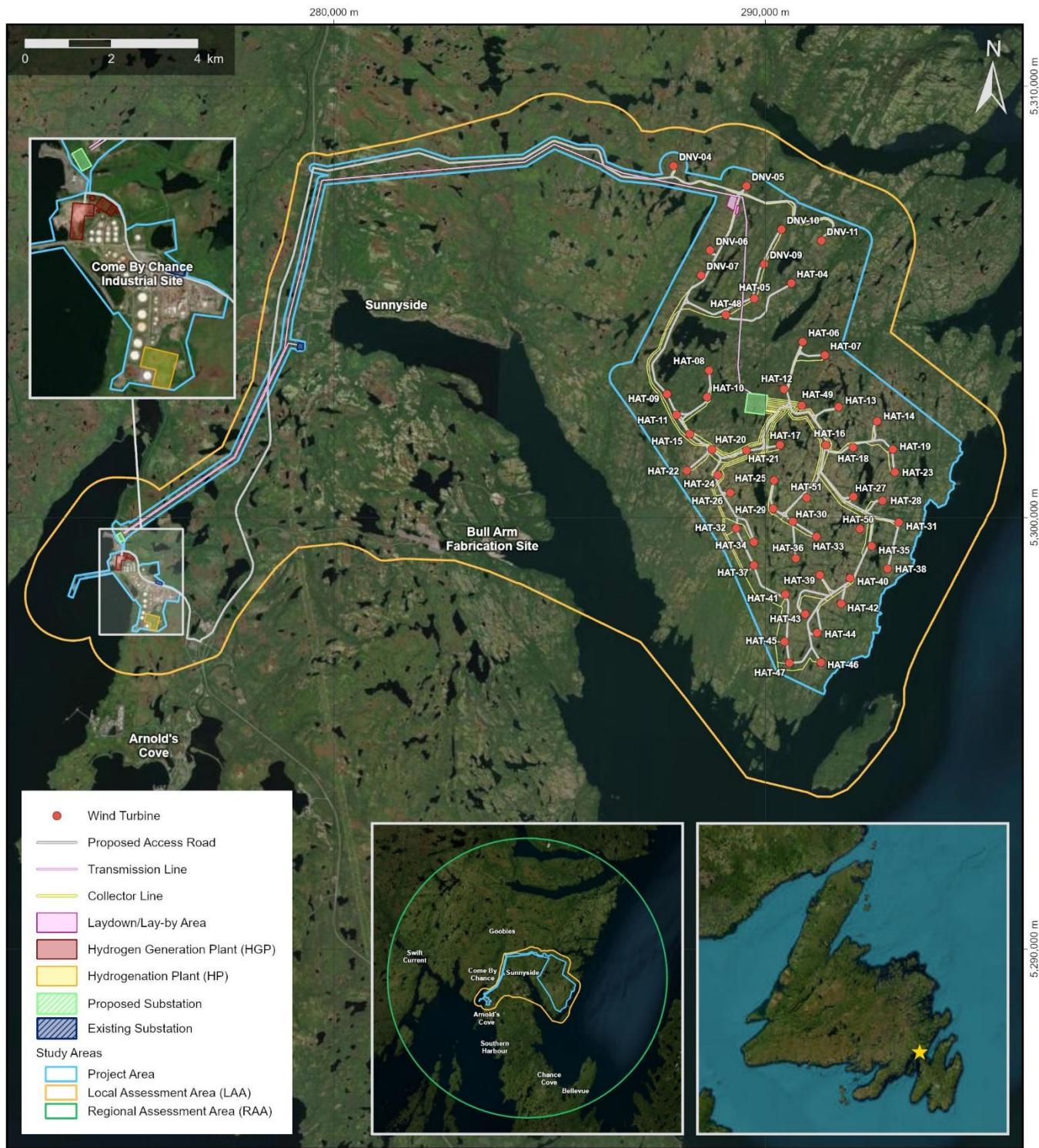


Figure D6-1.0-1 Project location and preliminary infrastructure layout.

## 2.0 Methods

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### 2.1 Desktop Study

A comprehensive desktop review was conducted to confirm the ranges and habitat preferences of the plant 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). However, only results from the PA and LAA were considered for the purposes of this report.

### 2.2 Field Surveys

Two separate field surveys were conducted to provide sufficient coverage of the PA. Surveyors reviewed satellite imagery and used knowledge of the PA to select survey sites. The goal was to achieve adequate coverage of the PA on a geospatial and ecological basis. Given the wide diversity of flora present in the PA, the survey team sought out and surveyed a range of sites comprising different plant communities. Characteristics such as forest maturity and species makeup, presence of bedrock and depth/quality of soils, wetland or proximity to wetlands, watercourse and/or runoff movement, and coastal environments and proximity to the ocean were used to ensure a sufficient variety of sites was surveyed. Wetlands and rocky outcrops are known to harbour several rare plant species, and these habitat types were the primary focus of the rare plant surveys. However, a broad effort was applied to all habitat types.

These surveys utilized a “targeted meander” approach throughout each site. The field crew would slowly walk through an area while keeping a written tally of all plants observed. This ensured that any new plants observed would not be overlooked. Subject matter experts with practical experience in plant identification were contracted so that many species could be confidently identified in the field. In instances where there was uncertainty, online dichotomous keys or species descriptions were employed to confirm an identification. If identification was still difficult, photos of the plant in situ were taken and a sample of the specimen was collected. These collected specimens were identified in an office or laboratory setting where access to microscopes and other visual aids enabled biologists to confirm identifications.

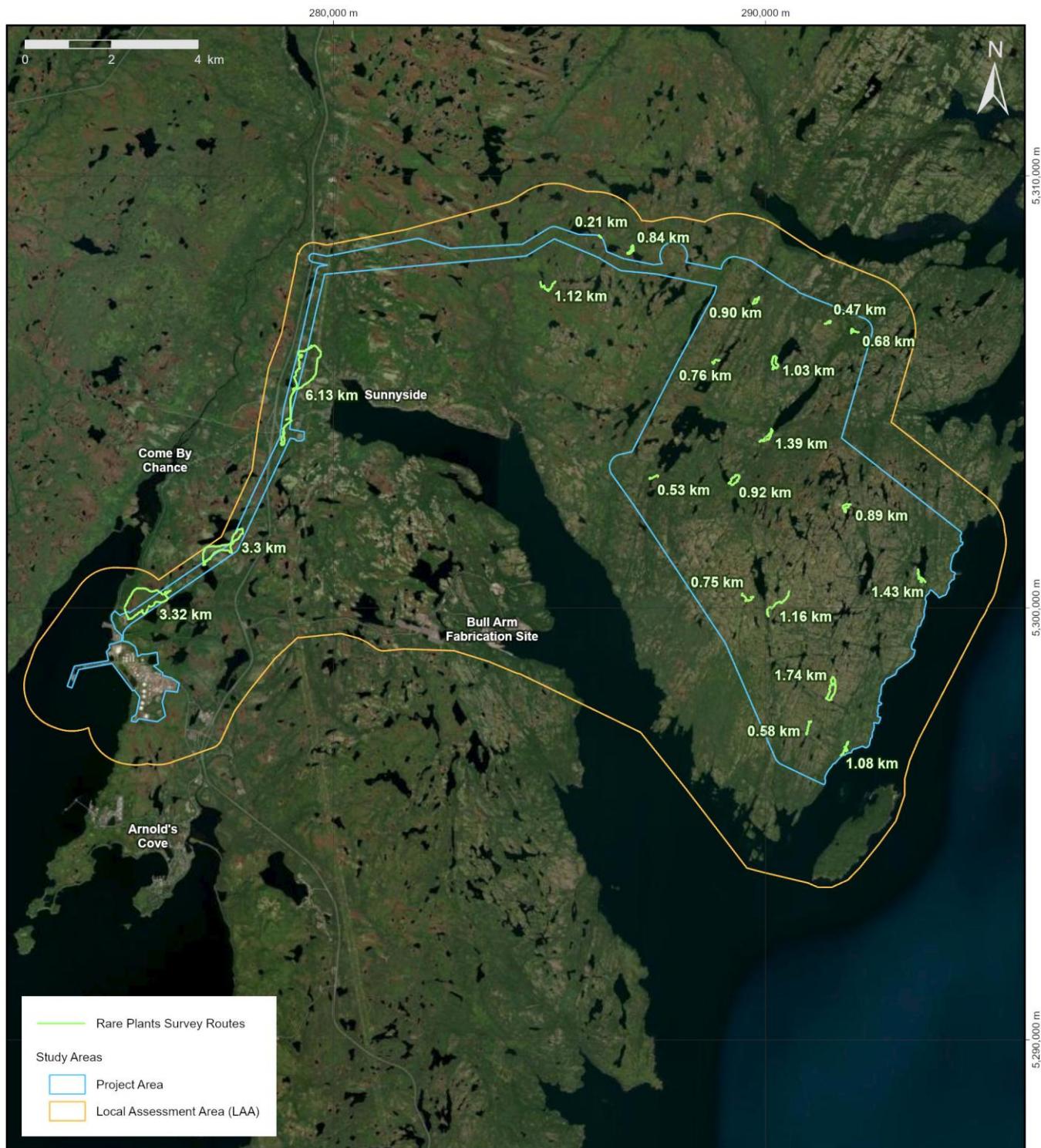
Upon identification of any rare plants ranked S1-S3, the following data was collected:

- GPS coordinates;

- A count of individuals; and
- Photos of the plant and collection site.

Any species that could not be identified in the field but were suspected to be ranked S1-S3 were given the same treatment.

Surveys were conducted from August 19 to 23, and 26 to 31, 2024. Figure D6-2.2-1 illustrates the locations surveyed. As an added effort, on July 30, 2024, a species-specific survey was conducted for water pygmyweed. Surveyors visited a location known as the Come By Chance “Gut”, an area identified as having the potential to host water pygmyweed, given the presence of tidal beaches, compacted coastal roadways, and salt marsh characteristics. Surveyors thoroughly transected all suitable areas for water pygmyweed.

**Figure D6-2.2-1 Rare plants survey effort.**

# 3.0 Results

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## 3.1 Desktop Study

A scan was undertaken to identify all federally and provincially protected plant Species at Risk (SAR) whose range includes NL, and to assess whether they are possible for the PA. Most SAR plant species are endemic to the western coast of Newfoundland, and many are specific to the limestone barrens found on the Great Northern Peninsula. A full list of protected plant species in the Province is provided as Table D6-3.1-1. This table lists the conservation status of these plants 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 D6-3.1-1 Conservation status of plant Species at Risk in Newfoundland.**

Scientific Name	Common Name	NL ESA	SARA	IUCN Red List
<i>Erioderma pedicellatum</i>	Alaska rein orchid	Endangered	Not Listed	Not Evaluated
<i>Salix jejuna</i>	Barrens willow	Endangered	Endangered	Not Evaluated
<i>Erysimum inconspicuum</i> var. <i>coarctatum</i>	Crowded wormseed mustard	Endangered	Not Listed	Not Evaluated
<i>Erigeron compositus</i>	Cutleaf fleabane	Endangered	Not Listed	Not Evaluated
<i>Maianthemum racemosum</i> subsp. <i>racemosum</i>	Feathery false Solomon's seal	Endangered	Not Listed	Not Evaluated
<i>Braya fernaldii</i>	Fernald's braya	Endangered	Endangered	Not Evaluated
<i>Ranunculus gmelinii</i>	Gmelin's watercrowfoot	Endangered	Not Listed	Least Concern
<i>Arnica griscomii</i> subsp. <i>griscomii</i>	Griscom's arnica	Endangered	Threatened	Not Evaluated
<i>Symphyotrichum ciliolatum</i>	Lindley's aster	Endangered	Not Listed	Not Evaluated
<i>Braya longii</i>	Long's braya	Endangered	Endangered	Not Evaluated
<i>Neotorularia humilis</i>	Low northern rockcress	Endangered	Not Listed	Not Evaluated
<i>Cystopteris montana</i>	Mountain bladder fern	Endangered	Not Listed	Not Evaluated
<i>Symphyotrichum boreale</i>	Northern bog aster	Endangered	Not Listed	Least Concern
<i>Listera borealis</i>	Northern twayblade	Endangered	Not Listed	Not Evaluated
<i>Ranunculus flammula</i> var. <i>ovalis</i>	Oval-leaved creeping spearwort	Endangered	Not Listed	Not Evaluated
<i>Prenanthes racemosa</i>	Rattlesnakeroot	Endangered	Not Listed	Not Evaluated
<i>Carex petricosa</i> var. <i>misandroides</i>	Rock dwelling sedge	Endangered	Not Listed	Not Evaluated
<i>Corallorrhiza striata</i> var. <i>vreelandii</i>	Vreeland's striped coralroot	Endangered	Not Listed	Not Evaluated
<i>Arnica angustifolia</i> subsp. <i>tomentosa</i>	Wooly arnica	Endangered	Not Listed	Not Evaluated
<i>Fraxinus nigra</i>	Black ash	Threatened	Not Listed*	Critically Endangered
<i>Astragalus bodinii</i>	Bodin's milkvetch	Threatened	Not Listed	Not Evaluated

Scientific Name	Common Name	NL ESA	SARA	IUCN Red List
<i>Hedysarum boreale</i> subsp. <i>mackenziei</i>	Mackenzie's sweetvetch	Threatened	Not Listed	Not Evaluated
<i>Mielichhoferia macrocarpa</i>	Porsild's bryum	Threatened	Threatened	Not Evaluated
<i>Pinus resinosa</i>	Red pine	Threatened	Not Listed	Least Concern
<i>Oclemena acuminata</i>	Sharpleaf aster	Threatened	Not Listed	Not Evaluated
<i>Symphyotrichum tradescantii</i>	Tradescant's aster	Threatened	Not Listed	Not Evaluated
<i>Draba pycnosperma</i>	Dense draba	Vulnerable	Not Listed**	Not Evaluated
<i>Astragalus robbinsii</i> var. <i>fernaldii</i>	Fernald's milk-vetch	Vulnerable	Special Concern	Not Evaluated
<i>Thelypteris queelpaertensis</i>	Mountain fern	Vulnerable	Not Listed	Not Evaluated
<i>Tillaea aquatica</i> syn. <i>Crassula aquatica</i>	Water pygmyweed	Vulnerable	Not Listed	Not Evaluated
<i>Polystichum scopolinum</i>	Mountain holly fern	Not Listed	Threatened	Not Evaluated
<b>Notes</b>				
* Under consideration for addition to Schedule 1 of the SARA as Threatened.				
** Under consideration for addition to Schedule 1 of the SARA as Special Concern.				

Of the 31 SAR plant species listed as present on the island of Newfoundland, only the water pygmyweed (*Tillaea aquatica*) is considered a candidate for presence in the PA. *Tillaea aquatica* is a very small semi-aquatic annual with rounded leaves and tiny white flowers (NL WD, 2021). It ranges in size from 2 mm to 3 cm, and its colour varies between red, yellow, and green (NL WD, 2021). It occurs in semi-aquatic anthropogenic environments (e.g., quarry pits, roadside ditches), and is known to prefer the coast (NL WD, 2021). This plant has only been observed on the Avalon and Burin Peninsulas in Newfoundland (NL WD, 2021); however, given the proximity of the Come By Chance area to both peninsulas, it was concluded that the species may be present.

The AC CDC inquiry yielded results for zero (0) SAR or SCC within the PA. One (1) SCC, *Andreaea rothii*, was reported within the LAA approximately 1 km north of the PA boundary. This plant is currently ranked S3S4 and was observed in the year 1890 at UTM Zone 22T 285851 E, 5309991 N.

## 3.2 Field Surveys

No SAR were observed during rare plants surveys in the PA, and no water pygmyweed were observed during the species-specific survey. However, thirty-six (36) SCC were recorded throughout the PA. Note that in early March 2025, the PA boundaries were slightly altered to amalgamate the transmission line and access road corridors. This change occurred after the completion of the rare plants survey thus some plants may fall outside of the current PA boundaries. However, each plant identified as being within PA boundaries at the time of the surveys is discussed in this report. Plant locations are visible in Figure D6-3.2-1.

For the purposes of this report, SCC are defined as plants with an AC CDC S-rank of S1 (imperiled) to S3 (vulnerable). S-rank definitions are provided in Appendix D6-2. Table D6-3.2-1 presents all of the S1-S3 plants recorded, organized by S-rank. Plants ranked from S1 to S3 are discussed further below. Plants ranked S3S#, indicating uncertainty in the ranking, are listed but not discussed in detail. A full list of all plants identified is available as Appendix D6-1.

**Table D6-3.2-1 SCC observed in the PA, August 2024.**

Scientific Name	Common Name	S-Rank
<i>Carex tonsa</i>	Shaved sedge	S1
<i>Eriophorum gracile</i>	Slender cotton-grass	S1
<i>Lycopodium lagopus</i>	One-cone clubmoss	S2
<i>Najas flexilis</i>	Wavy water-nymph	S2
<i>Polypodium virginianum</i>	Rock polypody	S2
<i>Aronia melanocarpa</i>	Black chokeberry	S2S4
<i>Carex scoparia</i>	Pointed broom sedge	S3
<i>Juncus militaris</i>	Bayonet rush	S3
<i>Nymphaea odorata</i>	American water-lily	S3
<i>Malaxis unifolia</i>	Green adder's-mouth	S3
<i>Rhinanthus minor</i>	Little yellow-rattle	S3
<i>Sparganium americanum</i>	American bur-reed	S3
<i>Rhizomnium appalachianum</i>	Appalachian leafy moss	S3
<i>Myriophyllum tenellum</i>	Slender water-milfoil	S3
<i>Schoenoplectus subterminalis</i>	Water clubrush	S3
<i>Scirpus cyperinus</i>	Cottongrass bulrush	S3S4
<i>Eleocharis acicularis</i>	Least spike-rush	S3S4
<i>Carex interior</i>	Inland sedge	S3S4
<i>Diapensia lapponica</i>	Lapland diapensia	S3S4
<i>Gaylussacia bigeloviana</i>	Dwarf huckleberry	S3S4
<i>Bartonia paniculata</i> ssp. <i>iodandra</i>	Twining screwstem	S3S4
<i>Huperzia selago</i>	Fir clubmoss	S3S4
<i>Taxus canadensis</i>	Canada yew	S3S4
<i>Mnium hornum</i>	Swan's-neck leafy moss	S3S4
<i>Ulota crispa</i>	Crisped pincushion moss	S3S4
<i>Bartonia paniculata</i>	Twining screwstem	S3S4
<i>Potamogeton pusillus</i>	Small pondweed	S3S4
<i>Ribes hirtellum</i>	Smooth-stemmed gooseberry	S3S4
<i>Sparganium hyperboreum</i>	Northern bur-reed	S3S4
<i>Stuckenia filiformis</i>	Slender-leaved pondweed	S3S4
<i>Pellia epiphylla</i>	Common pellia	S3S5
<i>Ptilidium pulcherrimum</i>	Naugehyde liverwort	S3S5
<i>Ptilidium ciliare</i>	Northern Naugehyde liverwort	S3S5

Scientific Name	Common Name	S-Rank
<i>Scapania nemorea</i>	Grove earwort	S3S5
<i>Deschampsia cespitosa</i>	Tufted hairgrass	S3S5
<i>Prunella vulgaris</i>	Self-heal	S3S5

A map of the plants observed in the PA with a ranking between S1 and S3 (excluding S3S#) is provided as Figure D6-3.2-1. Note that, with the exception of Figure D6-3.2-14, all plant pictures provided in this report were taken in the PA in August 2024.

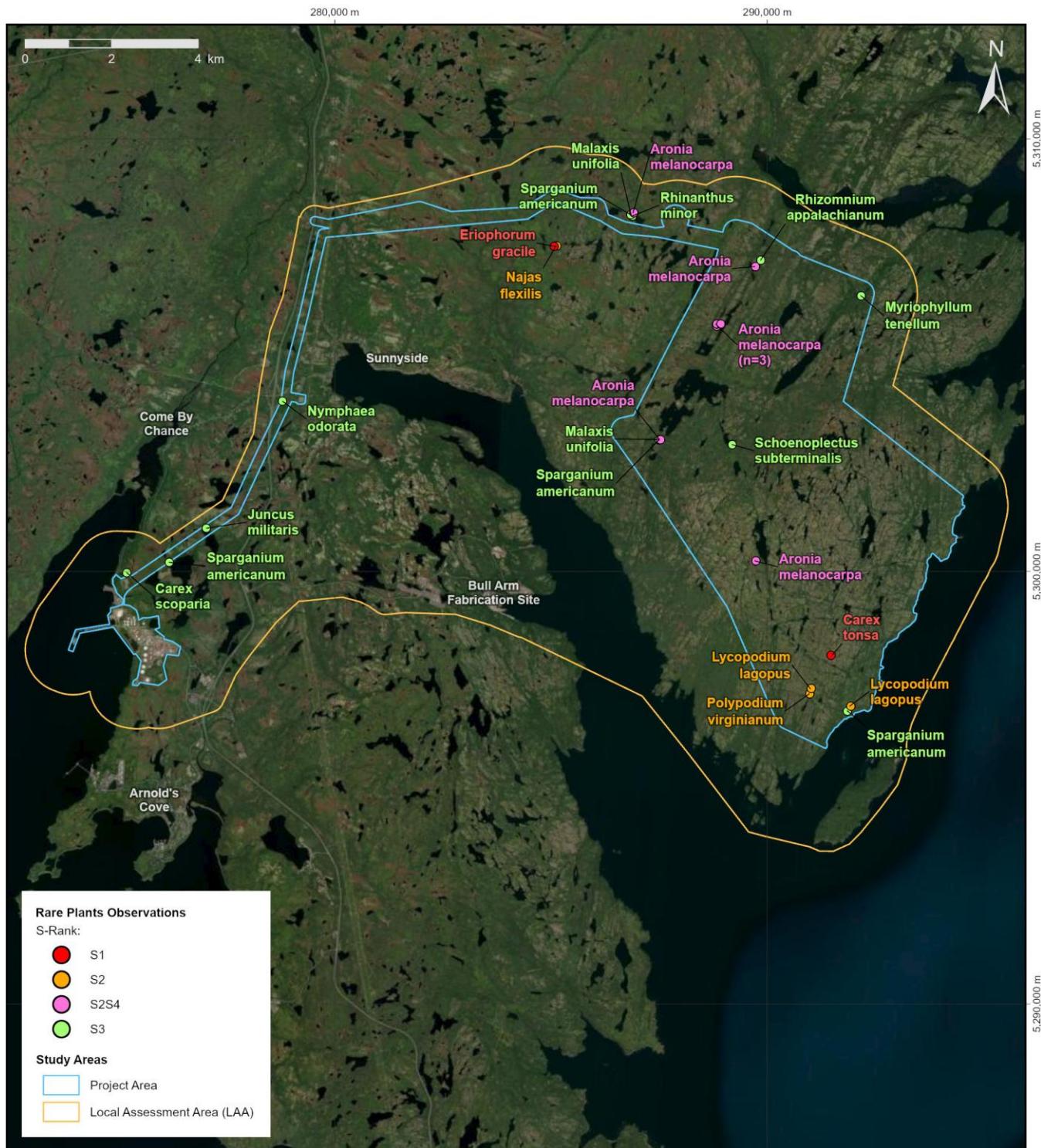


	FIGURE TITLE:	<p><b>Rare Plants Observed in the Project Area</b></p> <p>PROJECT TITLE:</p> <p>North Atlantic Wind to Hydrogen Project</p>	<p>NOTES:</p> <p>All rare plant observations displayed on this map were recorded in August 2024.</p>	PREPARED BY:	DATE:
				C. Burke	06/06/2025
	REVIEWED BY:			C. Bursey	06/06/2025
	APPROVED BY:			C. Collins	06/06/2025
	CRS:			WGS 1984 UTM Zone 22N	

SEM MAP ID: 016-015-GIS-405-Rev0

**Figure D6-3.2-1 Locations of rare plants observed in the PA, August 2024.**

### ***Carex tonsa* | Shaved sedge**



**Figure D6-3.2-2 *Carex tonsa*.**

*Carex tonsa* is a densely tufted green sedge with inconspicuous flowering spikes (SSAC, 2008). *Carex tonsa* specimens observed in Newfoundland are noted to have especially short and uncommon spikes (SSAC, 2008). In Newfoundland this species is typically found in dry, open areas with sparse vegetation and sandy, silty, or pebbly soil (e.g., fields, barrens, roadsides) (SSAC, 2008).

*Carex tonsa* was discovered in the PA at UTM 22T 291496 E, 5298058 N.

### ***Eriophorum gracile* | Slender cotton-grass**



**Figure D6-3.2-3 *Eriophorum gracile*.**

*Eriophorum gracile* is a perennial with a thin stem and white, fluffy branched flowers (MDFW, 2019). The plant appears grass-like and produces between 2 to 5 flowers, supported by a creeping rhizome (MDFW, 2019). *Eriophorum gracile* typically occurs in wet swamps or peatlands (MDFW, 2019).

*Eriophorum gracile* was observed in the PA at UTM 22T 285092 E, 5307515 N in a seepy fen adjacent to a creek.

### *Lycopodium lagopus* | One-cone clubmoss



Figure D6-3.2-4 *Lycopodium lagopus*.

*Lycopodium lagopus* is an evergreen clubmoss with a creeping horizontal stem, from which erect vertical stems protrude (FNA, 1993). Hair-like leaves cover the horizontal and vertical stems, and this species is known to typically host only one strobilus (FNA, 1993). *Lycopodium lagopus* typically grows in damp, mossy areas such as peatbogs (FNA, 1993).

*Lycopodium lagopus* was discovered at two locations in the PA, roughly 50 m apart. Two specimens were observed at UTM Zone 22T, 291910 E, 5296888 N, and <5 at UTM Zone 22T, 290995 E, 5297292 N. The <5 *Lycopodium lagopus*, seen in Figure 3.2-3, were thought to show evidence of possible hybridization with nearby *Lycopodium clavatum*.

### *Najas flexilis* | Wavy water-nymph



Figure D6-3.2-5 *Najas flexilis*.

*Najas flexilis* is an aquatic annual with 10 to 35 mm long leaves that taper into a slender point (Lesica et al., 2012). They produce smooth seeds that are sometimes spotted (Lesica et al., 2012). *Najas flexilis* can be found in freshwater lakes or valleys, often in shallow water (Lesica et al., 2012).

*Najas flexilis* was found in the PA at UTM Zone 22T, 285117 E, 5307530 N in a shallow pool along a creek that ran through a fen. It was found along with *Sparganium hyperboreum*, *Potamogeton gramineus*, and some *Utricularia* species.

### *Polypodium virginianum* | Rock polypody



Figure D6-3.2-6 *Polypodium virginianum*.

*Polypodium virginianum* is a fern that produces solitary fronds up to 40 cm long (Boland, 2017). Its fronds are smooth, leathery, and pinnatifid, with sori on the underside of the fronds, on either side of the midvein (Boland, 2017). *Polypodium virginianum* in Newfoundland are typically found in rocky habitat like cliff edges, crevices, or on mossy rocks (Boland, 2017).

*Polypodium virginianum* was observed in the PA in a wooded rock gully at UTM Zone 22T, 290968 E, 5297169 N. It was thought to be a single plant with multiple fronds from its rhizome.

### *Aronia melanocarpa* | Black chokeberry



Figure D6-3.2-7 *Aronia melanocarpa*.

*Aronia melanocarpa* is a small shrub with dark oval leaves (Kask, 1987). This plant produces white flowers and black berries, which gradually lighten to red as the season progresses (Kask, 1987). *Aronia melanocarpa* prefers moist soil (e.g., bogs) but can grow in a variety of conditions, including rocky terrain (Kask, 1987).

*Aronia melanocarpa* was observed seven times in the PA, listed below in Table D6-3.2-2 (UTM Zone 22T).

Table D6-3.2-2 *Aronia melanocarpa* coordinates.

Easting	Northing
289714	5300243
287508	5303048
288817	5305673
288811	5305716
288909	5305723

Easting	Northing
289710	5307049
286897	5308293

### ***Carex scoparia* | Pointed broom sedge**



*Carex scoparia* is a yellow-green sedge with a thin stem ending in green spikes (Hurd et al., 1998). Its leaves are flat and yellow-green, located close to the ground (Hurd et al., 1998). *Carex scoparia* is found in moist environments, typically at lower elevations (Hurd et al., 1998).

*Carex scoparia* was observed once in the PA at UTM Zone 22T 275185 E, 5299974 N.

**Figure D6-3.2-8 *Carex scoparia*.**

### ***Juncus militaris* | Bayonet rush**



*Juncus militaris* is an aquatic plant with green grass-like leaves that extend above the water's surface (FNA, 2000). Its flowers are dense and spiky, sometimes clustered (FNA, 2000). *Juncus militaris* can be found in the shallow waters of lakes, ponds, or streams (FNA, 2000).

*Juncus militaris* was observed in the PA at UTM Zone 22T, 277033 E, 5300999 N.

**Figure D6-3.2-9 *Juncus militaris*.**

***Nymphaea odorata* | American water-lily**

**Figure D6-3.2-10** *Nymphaea odorata*.

*Nymphaea odorata* is an aquatic flowering plant whose leaves and flowers float on the water's surface, attached to the bottom by a thick stem (Boland, 2017). Its leaves are leathery and round, green on the surface with purple undersides (Boland, 2017). It hosts large flowers with white petals and yellow stamens (Boland, 2017). In Newfoundland, *Nymphaea odorata* can be found in ponds and wetland pools, preferring still, acidic, clear water (Boland, 2017).

*Nymphaea odorata* was observed once in the PA near the NL Hydro Sunnyside substation at approximately UTM Zone 22T 278792 E, 5303933 N.

***Malaxis unifolia* | Green adder's-mouth**

**Figure D6-3.2-11** *Malaxis unifolia*.

*Malaxis unifolia* is a small green or yellow-green orchid with a single smooth stem (Boland, 2017). Its flowers are crowded and green, with recurved petals and a three-lobed lip (Boland, 2017). In Newfoundland, *Malaxis unifolia* is found in wet environments such as bogs, wet meadows, or on wet gravelly slopes (Boland, 2017).

*Malaxis unifolia* was observed twice in the PA, once at UTM Zone 22T, 287503 E, 5303050 N, and once at UTM Zone 22T, 286851 E, 5308242 N.

***Rhinanthus minor* | Little yellow-rattle**



**Figure D6-3.2-12      *Rhinanthus minor*.**

*Rhinanthus minor* is an annual with tube-like yellow flowers that grow on a single smooth stem (Boland, 2017). Each flower has five petals, surrounded by veiny, green, toothed leaves often tinted with brown (Boland, 2017). In Newfoundland, *Rhinanthus minor* can be found in a range of habitats like old meadows, barrens, and coastal headlands (Boland, 2017).

*Rhinanthus minor* was found in the PA at UTM Zone 22T, 286876 E, 5308217 N.



**Figure D6-3.2-13      *Sparganium americanum*.**

*Sparganium americanum* is a perennial bur-reed, similar in appearance to grass, with flat green leaves that grow up to 1 m in height (FNA, 2000). This plant produces flower heads resembling spiky green-brown balls that eventually produce white flowers (FNA, 2000). *Sparganium americanum* is found in shallow waters along watercourses, waterbodies, or wetlands (FNA, 2000).

*Sparganium americanum* was observed in wetlands throughout the PA. This species was formally observed four times, as listed in Table D6-3.2-3 below (UTM Zone 22T). Due to its apparent abundance throughout the area, further observations were made but not recorded.

**Table D6-3.2-3** *Sparganium americanum* coordinates.

Easting	Northing
291855	5296775
287503	5303050
286851	5308242
276170	5300211

***Rhizomnium appalachianum* | Appalachian leafy moss**

**Figure D6-3.2-14** *Rhizomnium appalachianum*.

(Source: Faubert, n.d.). No image available from PA.

*Rhizomnium appalachianum* is a moss with large, dark green leaves and dark red stems (FNA, 2014). This plant typically grows between 4 to 8 cm tall, sometimes with rhizoids (i.e., hair-like growth) along the leaf bases (FNA, 2014). *Rhizomnium appalachianum* grows in moist or wet conditions (FNA, 2014).

*Rhizomnium appalachianum* was observed in the PA at UTM Zone 22T, 289848 E, 5307198 N.



**Figure D6-3.2-15** *Myriophyllum tenellum*.

*Myriophyllum tenellum* is an aquatic or semi-aquatic perennial with thin stems and only few small leaves (FNA, 2021). Its inflorescences grow up to 9 cm long and host small flowers on either side of the stem, at the top (FNA, 2021). *Myriophyllum tenellum* is found in bodies of water, typically submersed, although it can persist on shorelines (FNA, 2021).

*Myriophyllum tenellum* was observed in the PA at UTM Zone 22T, 292168 E, 5306373 N.

### ***Schoenoplectus subterminalis* | Water clubrush**



**Figure D6-3.2-16**

***Schoenoplectus subterminalis*.**

*Schoenoplectus subterminalis* is a perennial aquatic plant (sometimes terrestrial) that forms mats of slender stems up to 1.5 m long (FNA, 2003). This plant is typically submerged except for its inflorescences, which consist of a single spikelet that will produce a white flower (FNA, 2003). *Schoenoplectus subterminalis* is found in wet areas, such as ponds, lakes, or rivers (FNA, 2003).

*Schoenoplectus subterminalis* was observed in the PA at UTM Zone 22T, 289193 E, 5302930 N.

## 4.0 Discussion

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The nature of the PA is conducive to a high level of plant diversity. The sharp contrasts from rich forests to extreme barrens present a broad array of habitat characteristics that support drastically different plant communities. Numerous small wetlands were broken up by the emerging bedrock in the southern portion of the PA. The barren portions of the PA are divided by valleys which accommodate a lush plant community influenced by the protection from coastal conditions and additional nutrient input from the convergence of runoff. Many of these valleys accommodate streams which flow through both shaded forests and open areas with full sun.

The northwestern section of the PA encompasses mature forests dominated by balsam fir (*Abies balsamea*), black spruce (*Picea mariana*), and white birch (*Betula papyrifera*). All these trees persist in various ecotypes. These forests' understory hosts a myriad of understory plants and moss species. Peppered in these forested areas are numerous interconnected ponds and lakes often contained and surrounded by hydrophytic and aquatic vegetation. Many bogs, fens, and marshes are positioned throughout the PA hosting their own vegetation communities.

Although the rare plant field and desktop surveys discovered 36 rare plant species, none are classified as SAR on a federal or provincial level. Only one SAR is considered a candidate for presence in the PA. Water pygmyweed is known to exist on the Avalon Peninsula in nearby Argentia (NL WD, 2021). However, its tendency to favour anthropogenically compacted coastlines does not coincide with the majority of coast in the PA (NL WD, 2021). This plant was not observed in the PA, despite survey effort around the North Atlantic Industrial Site area.

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## Appendix D6-1: Plants Identified in the PA

Scientific Name	Common Name
<i>Abies balsamea</i>	Balsam fir
<i>Acer rubrum</i>	Red maple
<i>Acer spicatum</i>	Mountain maple
<i>Achillea millefolium</i>	Common yarrow
<i>Agrostis capillaris</i>	Colonial bentgrass
<i>Agrostis gigantea</i>	Redtop
<i>Agrostis mertensii</i>	Northern bentgrass
<i>Agrostis scabra</i>	Hair bentgrass
<i>Alnus alnobetula ssp. <i>crispa</i></i>	Green alder
<i>Alnus incana</i>	Speckled alder
<i>Alnus incana ssp. <i>rugosa</i></i>	Speckled alder
<i>Alnus viridis</i>	Green alder
<i>Alopecurus pratensis</i>	Meadow foxtail
<i>Amauropelta noveboracensis</i>	New york fern
<i>Amelanchier bartramiana</i>	Bartram's serviceberry
<i>Anaphalis margaritacea</i>	Pearly everlasting
<i>Andromeda polifolia</i>	Bog rosemary
<i>Anemonastrum canadense</i>	Canada anemone
<i>Anthoxanthum odoratum</i>	Sweet vernalgrass
<i>Aralia nudicaulis</i>	Wild sarsaparilla
<i>Arethusa bulbosa</i>	Dragon's-mouth
<i>Aronia melanocarpa</i>	Black chokeberry
<i>Aronia x prunifolia</i>	Purple chokeberry
<i>Athyrium filix-femina</i>	Lady fern
<i>Bartonia paniculata</i>	Twining screwstem
<i>Bartonia paniculata subsp. <i>iodandra</i></i>	Branched bartonia
<i>Bazzania trilobata</i>	Three-lobed bazzania
<i>Betula cordifolia</i>	Heart-leaved paper birch
<i>Betula michauxii</i>	Newfoundland dwarf birch
<i>Betula papyrifera</i>	Paper birch
<i>Bromus ciliatus</i>	Fringed brome
<i>Calamagrostis canadensis</i>	Bluejoint reedgrass
<i>Calamagrostis pickeringii</i>	Pickering's reed bent-grass
<i>Callitricha heterophylla</i>	Large water-starwort
<i>Callitricha stagnalis</i>	Pond water-starwort
<i>Cardamine pensylvanica</i>	Pennsylvania Bitter-cress
<i>Carex brunnescens</i>	Brownish sedge
<i>Carex buxbaumii</i>	Buxbaum's sedge
<i>Carex canescens</i>	Greyish sedge
<i>Carex debilis</i>	Weak-stemmed Sedge
<i>Carex echinata</i>	Star sedge
<i>Carex exilis</i>	Coast sedge
<i>Carex flava</i>	Yellow sedge
<i>Carex folliculata</i>	Northern long sedge

Scientific Name	Common Name
<i>Carex gynandra</i>	Nodding sedge
<i>Carex interior</i>	Inland sedge
<i>Carex lasiocarpa</i>	Slender sedge
<i>Carex leporina</i>	Oval sedge
<i>Carex limosa</i>	Mud sedge
<i>Carex livida</i>	Pale sedge
<i>Carex magellanica</i>	Poor sedge
<i>Carex michauxiana</i>	Michaux's sedge
<i>Carex nigra</i>	Smooth black sedge
<i>Carex oligosperma</i>	Few-seeded sedge
<i>Carex pauciflora</i>	Few-flowered sedge
<i>Carex scoparia</i>	Pointed broom sedge
<i>Carex stipata</i>	Awl-fruited Sedge
<i>Carex tonsa</i>	Shaved sedge
<i>Carex trisperma</i>	Three-seeded Sedge
<i>Carex utriculata</i>	Bear sedge
<i>Centaurea nigra</i>	Black knapweed
<i>Cerastium fontanum</i>	Mouse-ear Chickweed
<i>Chamaedaphne calyculata</i>	Leatherleaf
<i>Chamaenerion angustifolium</i>	Fireweed
<i>Chelone glabra</i>	Smooth turtlehead
<i>Cinna latifolia</i>	Nodding Wood-reed
<i>Clintonia borealis</i>	Bluebead lily
<i>Coptis trifolia</i>	Three-leaved Goldthread
<i>Corallorrhiza trifida</i>	Yellow coralroot
<i>Cornus canadensis</i>	Canada bunchberry
<i>Cornus sericea</i>	Red-osier Dogwood
<i>Cornus suecica</i>	Dwarf bog bunchberry
<i>Cypripedium acaule</i>	Pink Lady's slipper
<i>Cystopteris fragilis</i>	Fragile fern
<i>Danthonia spicata</i>	Poverty oatgrass
<i>Dasiphora fruticosa</i>	Golden-hardhack
<i>Dendrolycopodium dendroideum</i>	Prickly Ground-pine
<i>Deschampsia cespitosa</i>	Tufted hairgrass
<i>Diapensia lapponica</i>	Lapland diapensia
<i>Dicranum scoparium</i>	Broom forkmoss
<i>Doellingeria umbellata</i>	Flat-topped White Aster
<i>Drosera intermedia</i>	Spoon-leaved sundew
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>Dryopteris campyloptera</i>	Mountain wood fern
<i>Dryopteris carthusiana</i>	Spinulose shield fern
<i>Dryopteris intermedia</i>	Glandular wood fern
<i>Eleocharis acicularis</i>	Needle spike-rush
<i>Eleocharis palustris</i>	Common spike-rush

Scientific Name	Common Name
<i>Empetrum nigrum</i>	Black crowberry
<i>Epilobium ciliatum</i>	Fringed willowherb
<i>Epilobium palustre</i>	Marsh willowherb
<i>Equisetum arvense</i>	Field horsetail
<i>Equisetum sylvaticum</i>	Woodland horsetail
<i>Eriocaulon aquaticum</i>	Common pipewort
<i>Eriophorum angustifolium</i>	Narrow-leaved cotton-grass
<i>Eriophorum gracile</i>	Slender cotton-grass
<i>Eriophorum vaginatum</i>	Sheathed cotton-grass
<i>Eriophorum virginicum</i>	Tawny cotton-grass
<i>Euphrasia randii</i>	Small eyebright
<i>Euphrasia stricta</i>	Drug eyebright
<i>Eurybia radula</i>	Rough wood aster
<i>Euthamia graminifolia</i>	Grass-leaved goldenrod
<i>Festuca filiformis</i>	Hair fescue
<i>Festuca rubra</i>	Red fescue
<i>Fissidens osmundioides</i>	Osmund fissidens moss
<i>Fontinalis antipyretica</i>	Willow moss
<i>Fragaria virginiana</i>	Virginia strawberry
<i>Galeopsis tetrahit</i>	Common hemp-nettle
<i>Galium palustre</i>	Marsh bedstraw
<i>Galium trifidum</i>	Small bedstraw
<i>Galium triflorum</i>	Sweet-scented bedstraw
<i>Gaultheria hispidula</i>	Creeping snowberry
<i>Gaylussacia bigeloviana</i>	Dwarf huckleberry
<i>Glyceria borealis</i>	Small floating manna-grass
<i>Glyceria canadensis</i>	Canada manna-grass
<i>Gymnocarpium dryopteris</i>	Northern oak fern
<i>Hieracium lachenalii</i>	Common hawkweed
<i>Hieracium maculatum</i>	Spotted hawkweed
<i>Hieracium umbellatum</i>	Canada hawkweed
<i>Hippuris vulgaris</i>	Common mare's-tail
<i>Huperzia appressa</i>	Mountain fir-moss
<i>Huperzia selago</i>	Fir clubmoss
<i>Hylocomium splendens</i>	Stairstep moss
<i>Hypericum canadense</i>	Canadian St. John's-wort
<i>Hypericum fraseri</i>	Fraser's Marsh St. John's-wort
<i>Hypericum perforatum</i>	Common St. John's-wort
<i>Hypnum imponens</i>	Brocade moss
<i>Ilex mucronata</i>	Mountain holly
<i>Iris versicolor</i>	Blueflag
<i>Juncus articulatus</i>	Jointed rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus bulbosus</i>	Bulbous rush

Scientific Name	Common Name
<i>Juncus canadensis</i>	Canada rush
<i>Juncus conglomeratus</i>	Compact rush
<i>Juncus dudleyi</i>	Dudley's rush
<i>Juncus effusus</i>	Soft rush
<i>Juncus filiformis</i>	Thread rush
<i>Juncus militaris</i>	Bayonet rush
<i>Juncus pelocarpus</i>	Brown-fruited rush
<i>Juncus tenuis</i>	Slender rush
<i>Juncus tweedyi</i>	Tweedy's rush
<i>Juniperus communis</i>	Common juniper
<i>Juniperus horizontalis</i>	Creeping juniper
<i>Kalmia angustifolia</i>	Sheep-laurel
<i>Kalmia polifolia</i>	Swamp-laurel
<i>Larix laricina</i>	American larch
<i>Lathyrus japonicus</i>	Beach peavine
<i>Leucanthemum vulgare</i>	Oxeye daisy
<i>Linaria repens</i>	Pale toadflax
<i>Linaria vulgaris</i>	Butter-and-eggs
<i>Linnaea borealis</i>	Twinflower
<i>Lobaria scrobiculata</i>	Textured lungwort
<i>Lobelia dortmanna</i>	Water lobelia
<i>Lonicera villosa</i>	Mountain fly-honeysuckle
<i>Lotus corniculatus</i>	Bird's-foot trefoil
<i>Luzula multiflora</i>	Heath wood-rush
<i>Lycopodiella inundata</i>	Bog clubmoss
<i>Lycopodium annotinum</i>	Stiff clubmoss
<i>Lycopodium clavatum</i>	Running clubmoss
<i>Lycopodium dendroideum</i>	Treelike clubmoss
<i>Lycopodium lagopus</i>	One-cone clubmoss
<i>Lycopus uniflorus</i>	Northern bugleweed
<i>Lysimachia borealis</i>	Northern starflower
<i>Lysimachia terrestris</i>	Swamp loosestrife
<i>Maianthemum canadense</i>	Wild lily-of-the-valley
<i>Maianthemum trifolium</i>	Three-leaved false Solomon's-seal
<i>Malaxis unifolia</i>	Green adder's-mouth
<i>Menyanthes trifoliata</i>	Buckbean
<i>Mnium hornum</i>	Horn calcareous moss
<i>Moneses uniflora</i>	One-flowered wintergreen
<i>Monotropa uniflora</i>	Ghost-pipe
<i>Myrica gale</i>	Sweet gale
<i>Myriophyllum tenellum</i>	Slender water-milfoil
<i>Nabalus trifoliolatus</i>	Three-leaved rattlesnake-root
<i>Najas flexilis</i>	Wavy water-nymph
<i>Nemopanthus mucronatus</i>	Mountain holly

Scientific Name	Common Name
<i>Nuphar variegata</i>	Variegated yellow pond-lily
<i>Nymphaea odorata</i>	American white water-lily
<i>Oclemena nemoralis</i>	Bog aster
<i>Oenothera parviflora</i>	Northern evening-primrose
<i>Onoclea sensibilis</i>	Sensitive fern
<i>Orthilia secunda</i>	One-sided wintergreen
<i>Osmundastrum cinnamomeum</i>	Cinnamon fern
<i>Pellia epiphylla</i>	Common pellia
<i>Phegopteris connectilis</i>	Northern beech fern
<i>Phleum pratense</i>	Common timothy
<i>Picea glauca</i>	White spruce
<i>Picea mariana</i>	Black spruce
<i>Pilosella piloselloides</i>	Smooth hawkweed
<i>Plantago major</i>	Common plantain
<i>Plantago maritima</i>	Sea plantain
<i>Platanthera blephariglottis</i>	White fringed-orchid
<i>Platanthera clavellata</i>	Club-spur orchid
<i>Platanthera dilatata</i>	White bog-orchid
<i>Platanthera orbiculata</i>	Round-leaved rein-orchid
<i>Pleurozium schreberi</i>	Schreber's feathermoss
<i>Polypodium virginianum</i>	Rock polypody
<i>Polytrichum commune</i>	Common haircap moss
<i>Polytrichum juniperinum</i>	Juniper haircap moss
<i>Polytrichum strictum</i>	Bog haircap moss
<i>Potamogeton epihydrus</i>	Ribbon-leaved pondweed
<i>Potamogeton gramineus</i>	Grassy pondweed
<i>Potamogeton natans</i>	Floating-leaved pondweed
<i>Potamogeton polygonifolius</i>	Bog pondweed
<i>Potamogeton pusillus</i>	Small pondweed
<i>Prunella vulgaris</i>	Self-heal
<i>Prunus virginiana</i>	Choke cherry
<i>Pteridium aquilinum</i>	Bracken fern
<i>Ptilidium ciliare</i>	Northern naugehyde liverwort
<i>Ptilidium pulcherrimum</i>	Naugehyde liverwort
<i>Ptilium crista-castrensis</i>	Knights plume moss
<i>Racomitrium lanuginosum</i>	Wolly fringe-moss
<i>Ranunculus acris</i>	Meadow buttercup
<i>Ranunculus flammula</i>	Lesser spearwort
<i>Ranunculus repens</i>	Creeping buttercup
<i>Rhinanthus minor</i>	Yellow-rattle
<i>Rhinanthus minor ssp. minor</i>	Little yellow-rattle
<i>Rhizomnium appalachianum</i>	Appalachian leafy moss
<i>Rhodiola rosea</i>	Common roseroot
<i>Rhododendron canadense</i>	Rhodora

Scientific Name	Common Name
<i>Rhododendron groenlandicum</i>	Labrador tea
<i>Rhynchospora alba</i>	White beakrush
<i>Rhytidadelphus loreus</i>	Lanky moss
<i>Ribes glandulosum</i>	Skunk currant
<i>Ribes hirtellum</i>	Smooth-stemmed gooseberry
<i>Rosa nitida</i>	Shining rose
<i>Rosa virginiana</i>	Virginia rose
<i>Rubus chamaemorus</i>	Cloudberry
<i>Rubus hispida</i>	Swamp dewberry
<i>Rubus idaeus</i>	Red raspberry
<i>Rubus pubescens</i>	Trailing raspberry
<i>Rubus setosus</i>	Bristly blackberry
<i>Rumex acetosella</i>	Sheep sorrel
<i>Sagina procumbens</i>	Bird's-eye pearlwort
<i>Salix discolor</i>	American pussy willow
<i>Salix pyrifolia</i>	Balsam willow
<i>Sanguisorba canadensis</i>	Canada burnet
<i>Sarracenia purpurea</i>	Northern pitcher-plant
<i>Sarracenia purpurea</i> ssp. <i>purpurea</i>	Pitcher plant
<i>Scapania nemorea</i>	Grove earwort
<i>Schoenoplectus subterminalis</i>	Water clubrush
<i>Scirpus atrocinctus</i>	Black-girdle bulrush
<i>Scirpus cyperinus</i>	Wool-grass
<i>Scorzonera autumnalis</i>	Autumn hawkbit
<i>Selaginella selaginoides</i>	Low spike-moss
<i>Senecio viscosus</i>	Sticky groundsel
<i>Sibbaldia tridentata</i>	Three-toothed cinquefoil
<i>Sisyrinchium montanum</i>	Mountain blue-eyed grass
<i>Solidago canadensis</i>	Canada goldenrod
<i>Solidago juncea</i>	Early goldenrod
<i>Solidago macrophylla</i>	Large-leaved goldenrod
<i>Solidago rugosa</i>	Rough-leaved goldenrod
<i>Solidago uliginosa</i>	Bog goldenrod
<i>Sorbus americana</i>	American mountain-ash
<i>Sorbus decora</i>	Showy mountain-ash
<i>Sparganium americanum</i>	American bur-reed
<i>Sparganium angustifolium</i>	Narrow-leaved bur-reed
<i>Sparganium emersum</i>	Green-fruited bur-reed
<i>Sparganium hyperboreum</i>	Northern bur-reed
<i>Sphagnum capillifolium</i>	Northern peatmoss
<i>Sphagnum cuspidatum</i>	Toothed peatmoss
<i>Sphagnum flavicomans</i>	Northeastern peatmoss
<i>Sphagnum fuscum</i>	Sphagnum
<i>Sphagnum girgensohnii</i>	Girgensohn's peatmoss

Scientific Name	Common Name
<i>Sphagnum magellanicum</i>	Magellanic bogmoss
<i>Sphagnum majus</i>	Greater peatmoss
<i>Sphagnum palustre</i>	Prairie peatmoss
<i>Sphagnum papillosum</i>	Papillose peatmoss
<i>Sphagnum rubellum</i>	Red peatmoss
<i>Sphagnum tenellum</i>	Delicate peatmoss
<i>Spinulum annotinum</i>	Interrupted clubmoss
<i>Spinulum canadense</i>	Northern clubmoss
<i>Spiraea alba</i>	White meadowsweet
<i>Spiraea latifolia</i>	Broadleaf meadowsweet
<i>Spiranthes romanzoffiana</i>	Hooded ladies'-tresses
<i>Streptopus amplexifolius</i>	Clasping twistedstalk
<i>Streptopus lanceolatus</i>	Rosy twistedstalk
<i>Stuckenia filiformis</i>	Slender-leaved pondweed
<i>Symphyotrichum novi-belgii</i>	New York aster
<i>Symphyotrichum puniceum</i>	Swamp aster
<i>Taraxacum officinale</i>	Common dandelion
<i>Taxus canadensis</i>	Canada yew
<i>Thalictrum pubescens</i>	Tall meadow-rue
<i>Thelypteris noveboracensis</i>	New York fern
<i>Triadenum fraseri</i>	Marsh St. John's-wort
<i>Trichophorum alpinum</i>	Hudson Bay clubrush
<i>Trichophorum cespitosum</i>	Tufted clubrush
<i>Trientalis borealis</i>	Northern starflower
<i>Trifolium hybridum</i>	Alsike clover
<i>Trifolium pratense</i>	Red clover
<i>Trifolium repens</i>	White clover
<i>Tussilago farfara</i>	Common coltsfoot
<i>Typha latifolia</i>	Common cattail
<i>Ulota crispa</i>	Crisped pincushion moss
<i>Utricularia cornuta</i>	Horned bladderwort
<i>Utricularia intermedia</i>	Flat-leaved bladderwort
<i>Utricularia macrorhiza</i>	Greater bladderwort
<i>Utricularia minor</i>	Lesser bladderwort
<i>Utricularia vulgaris</i> ssp. <i>macrorhiza</i>	Common bladderwort
<i>Vaccinium angustifolium</i>	Lowbush blueberry
<i>Vaccinium boreale</i>	Northern blueberry
<i>Vaccinium macrocarpon</i>	Large cranberry
<i>Vaccinium microcarpum</i>	Small-fruited cranberry
<i>Vaccinium oxycoccus</i>	Small cranberry
<i>Vaccinium uliginosum</i>	Alpine blueberry
<i>Vaccinium vitis-idaea</i>	Lingonberry
<i>Veronica officinalis</i>	Common speedwell
<i>Viburnum cassinoides</i>	Wild raisin

Scientific Name	Common Name
<i>Vicia cracca</i>	Tufted vetch
<i>Viola cucullata</i>	Marsh blue violet
<i>Viola spp.</i>	Violet spp.

## Appendix D6-2: AC CDC S-rank Definitions

## Atlantic Canada Conservation Data Centre (AC CDC): Species Status Rankings

The AC CDC is a non-profit organization that measures biological diversity at a provincial level. AC CDC compiles data and conducts fieldwork to gain knowledge of the species inhabiting each Atlantic province, their distribution, and determine their species status (i.e., S-ranks). S-ranks are used to categorize species in terms of their rarity in the province. The following factors are taken into consideration when assigning S-ranks (AC CDC, n.d.):

- Number of element occurrences;
- Distribution;
- Population size;
- Abundance trends; and
- Threats.

The following table is adapted from AC CDC (n.d.).

S-rank	Description	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 to 40 years. A species or community could

<b>S-rank</b>	<b>Description</b>	<b>Definition</b>
		become SH without such a 20 to 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.