

APPENDIX 'K'

Rare Vascular Plant Survey Report



Rare Vascular Plant Survey Report: Grand Harbour, Grand Manan, NB

PID 15185465

June 16, 2018

For

Silk Stevens Design and Consulting Engineers

By

Theo Popma MSc. (Wetland Delineator) at Overdale Environmental Inc.

342 Highfield st.

Moncton, NB

E1C 5R6

tpopma@nb.sympatico.ca

www.Overdale.net

506-227-7605

:

TABLE OF CONTENTS

1.0 INTRODUCTION AND METHODS	2
2.0 RESULTS.	2
3.0 DISCUSSION	3
4.0 CLOSING	4
5.0 SOURCES	5
APPENDIX 1 Ranking	
APPENDIX 2: Plant List	
APPENDIX 3: Habitat Photos	
APPENDIX 4: Figures	
APPENDIX 5: Species Associations by Habitat	

1.0 INTRODUCTION AND METHODS

A vascular plant survey was conducted on PID 15185465 on Grand Manan Island, NB on June 16, 2018 (Figure 1). The GPS track shown in Figure 2 indicates the area covered during the survey. GPS points and photos were recorded as necessary to geographically locate prominent habitat-types or any species of conservation concern. All figures are shown in Appendix 4.

This survey was conducted in response to a proposed local development involving the expansion of a local arena into natural habitat adjacent to its parking area. The proposed footprint was surveyed but so was the remainder of the area of the PID. This is standard practice, but also since the PID is relatively small (less than 5ha) so stream channelling and wetland habitat make adjacent habitats ecologically contiguous.

Rare plant potential as estimated before the survey was considered to be 'high' according to both the online Connell Herbarium at UNB and the Atlantic Canada Conservation Data Center (ACDC). This is due to the presence of a variety of habitats including wetland, streams and nearly mature forest. However, no element occurrences were known specifically from this site.

2.0 RESULTS:

After approximately 4 hours of surveying, 94 species of vascular plants were identified. No species of conservation concern were confirmed. For a synopsis of the ranking system see Appendix 1. A full plant list is provided in Appendix 2. Photos of habitat-types are shown in Appendix 3. Lists of species assemblages representing each habitat are shown in Appendix 5.

2.1 Habitats

1. Forested Wetland

A small patch of Forested Wetland was identified along the southwestern edge of the PID. This habitat is near the wetland boundary and near small microtopographical incline of about 4 feet. Deeply pitted and hummocked mossy ground was relatively open and interspersed with ferns and shrubs. No channeling was observed, but this habitat was found to be similar to where Shrub Wetland narrows to form a channel beneath the forest canopy at the northern edge of the PID.

2. Shrub Wetland

This is the dominant wetland type on the PID. Speckled Alders dominate but sedge-dominated graminoid cover is also abundant. Smaller microhabitats such as bare-ground muddy depressions, open water, channels and upland inclusions were also present. Two

primary lobes of shrub wetland were present and found to be joined by a narrow (less than 5m) hydrological connection.

3. Field/Marsh

This area is likely mowed infrequently to keep shrub vegetation down, but some natural characteristics still persist. Part of this region was identified as wetland according to standard wetland delineation protocols. Poor drainage has led to a small marshy graminoid-dominated depression within the field. Exotics such as Tufted Vetch and Vernal Grass were common as well.

4. Lawn and Meadow

Lawn grasses allowed to grow freely occupy the edge of the parking area next to the slope leading to the nearby wetland. Canada Blue-Joint is also present. Virtually no shrubs are present here.

5. Dried Down Transition Zone

This is a relatively large area which apparently used to be wetland but has since dried down likely due to the presence/absence of beaver activity. Soils sampling and hydrological indicators show that this is not wetland, but the vast majority of vegetation is still hydrophytic. A slight slope also helps drain this region creating suitable habitat for upland species of grasses and even some large White Spruce.

6. Disturbed Forest Edge

Invasive herbaceous species dominate the understory of this habitat which is adjacent to the arena parking area. Young White Birch, Serviceberry and Speckled Alder are also present as shrubs and saplings.

7. Upland Forest

The Forest surrounding the wetland transition zone is moderate-aged to mature and consists of a mixture of coniferous and deciduous species such as White Spruce and White Birch. The understory is relatively empty and dominated by bryophytes as is typical of boreal forests. A substantial amount of blowdown is present especially around the edge near the open transitional zone.

3.0 DISCUSSION

This survey indicates that rare plant potential was probably not as high as estimated since no species of conservation concern were identified. Also, the fact that the wetland was both

impacted and dried down probably affected species diversity. A reasonable amount of habitat variation was nonetheless found to be present, as a result. It should also be noted that the spring season had been unusually cold this year and that identifications of plants not yet mature or in flower was sometimes difficult or impossible. Ideally it is recommended that further plant surveys take place later in the summer to fully sample the flora.

4.0 CLOSING

I trust this information meets your current needs. Please feel free to contact me via telephone at (506) 227-7605 or by email at tpopma@nb.sympatico.ca if further clarification or explanation is required.

Sincerely,

A handwritten signature in black ink, appearing to read 'Theo Popma', is centered on the page. The signature is written in a cursive, flowing style.

Theo Popma BSc, MSc.
President, Overdale Environmental Inc.

5.0 SOURCES

Gleason, H. A. & A. Cronquist. 1991. Manual of vascular plants of northeastern United States and adjacent Canada, ed. 2.

Hinds, H. R. 2000. Flora of New Brunswick, ed. 2.

Photo: Great Duckweed (*Spirodela polyrrhiza*): <http://www.biolib.cz/IMG/GAL/34823.jpg>

Photo: *Boehmeria cylindrica*. Dave Mazerolle. ACCDC.

APPENDIX 1: RANKS

S Rank, N Rank, G Rank: Sub-national, National and Global Rarity rank of species, using CDC/NatureServe methods.

- 1 = Extremely rare (typically 5 or fewer occurrences or very few remaining individuals)
- 2 = Rare (6 to 20 occurrences or few remaining individuals)
- 3 = Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in some locations. (21 to 100 occurrences)
- 4 = Usually widespread (100+ occurrences)
- 5 = Demonstrably widespread

NR = Not Ranked

S1S2 = Range rank: in between S1 and S2, for example

? = Inexact numeric rank

E= Exotic species

(For more info on NatureServe/CDC Ranks; <http://www.natureserve.org/explorer/ranking.htm>)

GS Rank: General Status Rank for Canada and for New Brunswick: These ranks are the product of the National General Status Working Group (NGSWG), under the direction of the Canadian Wildlife Directors Committee (CWDC). The Canadian Wildlife Service, Parks Canada and Fisheries and Oceans Canada (DFO) also participate.

- 1.1 Extinct
- 1.2 Extirpated
- 2 At risk
- 3 May be at Risk
- 4 Sensitive
- 5 Secure
- 6 Undetermined
- 7 Not Assessed
- 8 Exotic
- 9 Accidental

(For more information on NB GS Ranks:

<http://www.wildspecies.ca/default.asp?Lang=En&n=56869CFA-1>

SPROT and NPROT: National conservation status of species, as designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the Canadian Species at Risk Act (SARA) and the Sub-national conservation status of species, as designated by given provincial jurisdiction (The New Brunswick Endangered Species Act).

- Extinct
- Extirpated
- Endangered
- Threatened
- Special concern
- Not at risk
- Data deficient

Scientific Name	Common Name	Srank	GSrank	Sprot
<i>Packera paupercula</i>	Balsam Groundsel	S4	4 Secure	0
<i>Callitriche heterophylla</i>	Large Water-Starwort	S4S5	4 Secure	0
<i>Carex nigra</i>	Smooth Black Sedge	S4S5	4 Secure	0
<i>Abies balsamea</i>	Balsam Fir	S5	4 Secure	0
<i>Agrostis perennans</i>	Upland Bent Grass	S5	4 Secure	0
<i>Agrostis stolonifera</i>	Creeping Bent Grass	S5	4 Secure	0
<i>Alnus incana</i>	Speckled Alder	S5	4 Secure	0
<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	S5	4 Secure	0
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5	4 Secure	0
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S5	4 Secure	0
<i>Athyrium filix-femina</i>	Common Lady Fern	S5	4 Secure	0
<i>Betula papyrifera</i>	Paper Birch	S5	4 Secure	0
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5	4 Secure	0
<i>Carex brunnescens</i>	Brownish Sedge	S5	4 Secure	0
<i>Carex canescens</i>	Silvery Sedge	S5	4 Secure	0
<i>Carex crinita</i>	Fringed Sedge	S5	4 Secure	0
<i>Carex debilis</i>	White-edged Sedge	S5	4 Secure	0
<i>Carex echinata</i>	Star Sedge	S5	4 Secure	0
<i>Carex gracillima</i>	Graceful Sedge	S5	4 Secure	0
<i>Carex leptalea</i>	Bristly-stalked Sedge	S5	4 Secure	0
<i>Carex novae-angliae</i>	New England Sedge	S5	4 Secure	0
<i>Carex pallescens</i>	Pale Sedge	S5	4 Secure	0
<i>Carex stipata</i>	Awl-fruited Sedge	S5	4 Secure	0
<i>Carex stricta</i>	Tussock Sedge	S5	4 Secure	0
<i>Carex trisperma</i>	Three-seeded Sedge	S5	4 Secure	0
<i>Conyza canadensis</i>	Canada Horseweed	S5	4 Secure	0
<i>Cornus canadensis</i>	Bunchberry	S5	4 Secure	0
<i>Danthonia spicata</i>	Poverty Oat Grass	S5	4 Secure	0
<i>Dryopteris cristata</i>	Crested Wood Fern	S5	4 Secure	0
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5	4 Secure	0
<i>Eleocharis acicularis</i>	Needle Spikerush	S5	4 Secure	0
<i>Equisetum arvense</i>	Field Horsetail	S5	4 Secure	0
<i>Equisetum fluviatile</i>	Water Horsetail	S5	4 Secure	0
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5	4 Secure	0
<i>Fragaria virginiana</i>	Wild Strawberry	S5	4 Secure	0
<i>Glyceria striata</i>	Fowl Manna Grass	S5	4 Secure	0
<i>Hierochloe odorata</i>	Vanilla Sweet Grass	S5	4 Secure	0
<i>Houstonia caerulea</i>	Azure Bluet	S5	4 Secure	0
<i>Hypericum canadense</i>	Canada St John's-wort	S5	4 Secure	0
<i>Iris versicolor</i>	Harlequin Blue Flag	S5	4 Secure	0

Scientific Name	Common Name	Srank	GSrank	Sprot
<i>Juncus effusus</i>	Soft Rush	S5	4 Secure	0
<i>Larix laricina</i>	Tamarack	S5	4 Secure	0
<i>Luzula multiflora</i>	Common Woodrush	S5	4 Secure	0
<i>Lycopus uniflorus</i>	Northern Water Horehound	S5	4 Secure	0
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	S5	4 Secure	0
<i>Onoclea sensibilis</i>	Sensitive Fern	S5	4 Secure	0
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5	4 Secure	0
<i>Panicum capillare</i>	Common Witch Grass	S5	4 Secure	0
<i>Picea glauca</i>	White Spruce	S5	4 Secure	0
<i>Picea rubens</i>	Red Spruce	S5	4 Secure	0
<i>Poa pratensis</i>	Kentucky Blue Grass	S5	4 Secure	0
<i>Populus tremuloides</i>	Trembling Aspen	S5	4 Secure	0
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5	4 Secure	0
<i>Prunus pennsylvanica</i>	Pin Cherry	S5	4 Secure	0
<i>Pteridium aquilinum</i>	Bracken Fern	S5	4 Secure	0
<i>Ribes lacustre</i>	Bristly Black Currant	S5	4 Secure	0
<i>Rubus allegheniensis</i>	Alleghaney Blackberry	S5	4 Secure	0
<i>Rubus idaeus</i>	Red Raspberry	S5	4 Secure	0
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5	4 Secure	0
<i>Rumex orbiculatus</i>	Greater Water Dock	S5	4 Secure	0
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5	4 Secure	0
<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	S5	4 Secure	0
<i>Solidago canadensis</i>	Canada Goldenrod	S5	4 Secure	0
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5	4 Secure	0
<i>Solidago sempervirens</i>	Seaside Goldenrod	S5	4 Secure	0
<i>Sorbus americana</i>	American Mountain Ash	S5	4 Secure	0
<i>Sparganium angustifolium</i>	Narrow-leaved Burreed	S5	4 Secure	0
<i>Spiraea alba</i>	White Meadowsweet	S5	4 Secure	0
<i>Symphotrichum novi-belgii</i>	New York Aster	S5	4 Secure	0
<i>Thalictrum pubescens</i>	Tall Meadow-Rue	S5	4 Secure	0
<i>Triadenum fraseri</i>	Fraser's Marsh St John's-wort	S5	4 Secure	0
<i>Trientalis borealis</i>	Northern Starflower	S5	4 Secure	0
<i>Typha latifolia</i>	Broad-leaved Cattail	S5	4 Secure	0
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	S5	4 Secure	0
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	S5	4 Secure	0
<i>Veronica officinalis</i>	Common Speedwell	S5	7 Exotic	0
<i>Viburnum nudum</i>	Northern Wild Raisin	S5	4 Secure	0
<i>Viola cucullata</i>	Marsh Blue Violet	S5	4 Secure	0
<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	SNA	7 Exotic	0
<i>Arctium minus</i>	Common Burdock	SNA	7 Exotic	0

Scientific Name	Common Name	Srank	GSrank	Sprot
<i>Bromus inermis</i>	Smooth Brome	SNA	7 Exotic	0
<i>Cerastium fontanum</i>	Common Chickweed	SNA	7 Exotic	0
<i>Dactylis glomerata</i>	Orchard Grass	SNA	7 Exotic	0
<i>Festuca filiformis</i>	Hair Fescue	SNA	7 Exotic	0
<i>Galium aparine</i>	Common Bedstraw	SNA	7 Exotic	0
<i>Hieracium x floribundum</i>	Smoothish Hawkweed	SNA	7 Exotic	0
<i>Leucanthemum vulgare</i>	Oxeye Daisy	SNA	7 Exotic	0
<i>Phleum pratense</i>	Common Timothy	SNA	7 Exotic	0
<i>Puccinellia distans</i>	Spreading Alkali Grass	SNA	7 Exotic	0
<i>Rumex acetosella</i>	Sheep Sorrel	SNA	7 Exotic	0
<i>Stachys palustris</i>	Marsh Hedge-Nettle	SNA	7 Exotic	0
<i>Taraxacum officinale</i>	Common Dandelion	SNA	7 Exotic	0
<i>Trifolium aureum</i>	Yellow Clover	SNA	7 Exotic	0
<i>Vicia cracca</i>	Tufted Vetch	SNA	7 Exotic	0

APPENDIX 3: HABITAT PHOTOS



Habitat Photo 1

Forested Wetland



Habitat Photo 2

Shrub Wetland



Habitat Photo 3

Field/Marsh



Habitat Photo 4

Lawn and Meadow



Habitat Photo 5

Dried Down Transition Zone



Habitat Photo 6

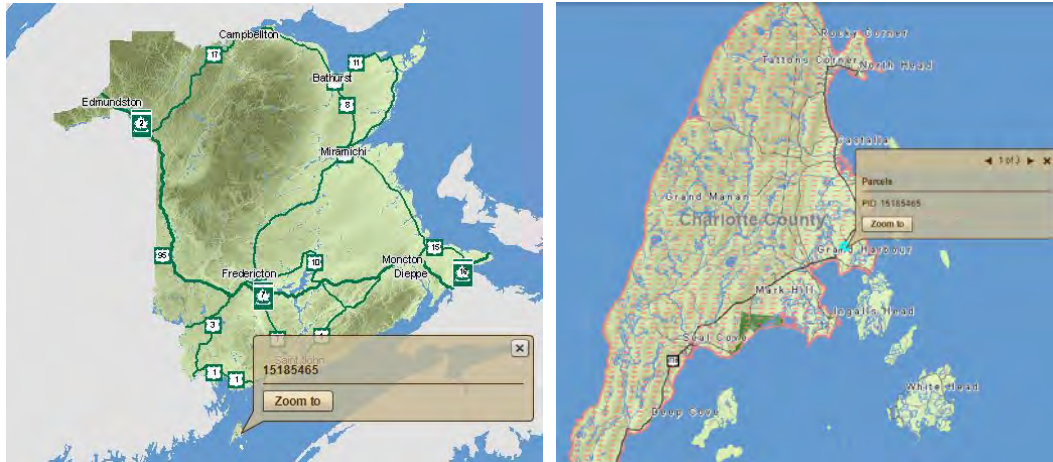
Disturbed Forest Edge



Habitat Photo 7

Mixed Upland Forest

APPENDIX 4: FIGURES



<p>Silk Stevens Design and Consulting Engineers</p>	<p>Figure 1</p>	<p>Project Location</p>	<p>Overdale Environmental Inc.</p>
---	-----------------	-------------------------	------------------------------------

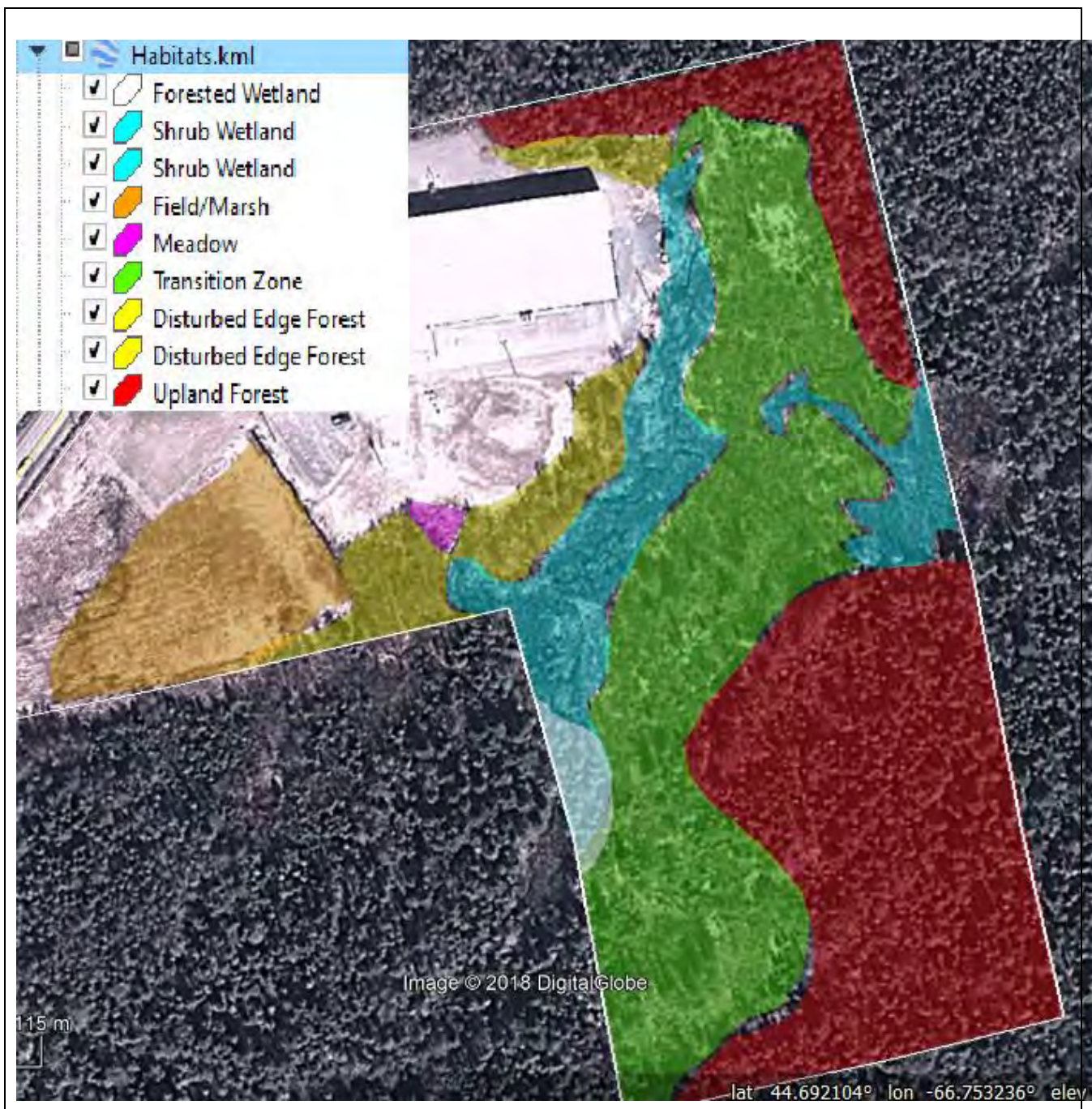


Silk Stevens Design
and Consulting
Engineers

Figure 2

Tracks

Overdale
Environmental Inc.



Silk Stevens Design and Consulting Engineers	Figure 3	Habitat Map	Overdale Environmental Inc.
--	----------	-------------	-----------------------------

APPENDIX 5: SPECIES-ASSOCIATIONS BY HABITAT

Table 1: Forested Wetland

<i>Abies balsamea</i>	Balsam Fir	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Stachys palustris</i>	Marsh Hedge-Nettle	SNA
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S5
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5

Table 2: Shrub Wetland

<i>Alnus incana</i>	Speckled Alder	S5
<i>Larix laricina</i>	Tamarack	S5
<i>Carex brunnescens</i>	Brownish Sedge	S5
<i>Carex stipata</i>	Awl-fruited Sedge	S5
<i>Carex nigra</i>	Smooth Black Sedge	S4S5
<i>Lycopus uniflorus</i>	Northern Water Horehound	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Carex stricta</i>	Tussock Sedge	S5

Table 3: Field/Marsh

<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	SNA
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5
<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	S5
<i>Iris versicolor</i>	Harlequin Blue Flag	S5
<i>Houstonia caerulea</i>	Azure Bluet	S5
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5
<i>Carex canescens</i>	Silvery Sedge	S5

Table 4: Lawn and Meadow

<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula papyrifera</i>	Paper Birch	S5
<i>Larix laricina</i>	Tamarack	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5
<i>Poa pratensis</i>	Kentucky Blue Grass	S5
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5

Table 5: Dried Down Transition Zone

<i>Alnus incana</i>	Speckled Alder	S5
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5
<i>Agrostis perennans</i>	Upland Bent Grass	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	SNA
<i>Carex gracillima</i>	Graceful Sedge	S5
<i>Rubus idaeus</i>	Red Raspberry	S5
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	S5

Table 6: Disturbed Forest Edge

<i>Abies balsamea</i>	Balsam Fir	S5
<i>Taraxacum officinale</i>	Common Dandelion	SNA
<i>Luzula multiflora</i>	Common Woodrush	S5
<i>Picea glauca</i>	White Spruce	S5
<i>Carex pallescens</i>	Pale Sedge	S5
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5
<i>Symphyotrichum novi-belgii</i>	New York Aster	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5

Table 7: Upland Forest

<i>Trientalis borealis</i>	Northern Starflower	S5
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Larix laricina</i>	Tamarack	S5
<i>Betula papyrifera</i>	Paper Birch	S5
<i>Populus tremuloides</i>	Trembling Aspen	S5
<i>Picea glauca</i>	White Spruce	S5
<i>Viburnum nudum</i>	Northern Wild Raisin	S5
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	S5
<i>Cornus canadensis</i>	Bunchberry	S5
<i>Carex echinata</i>	Star Sedge	S5