

October 25, 2010

Mr. Scott MacCallum Clayton Developments Limited 255 Lacewood Drive Halifax, NS, B3M 4G2 MTL Project No. 11263

Sent Via Email:

Dear Mr. MacCallum:

Re: Washmill Lake Court Extension Area Wetlands #4, 10 and 11 Bayers Lake/Fairview, Halifax, Nova Scotia

As requested, Maritime Testing delineated three wetlands on lands north of the Washmill Lake roadway extension project. We marked the wetland boundaries using pink flagging tape and subcontracted two biologists (a botanist and an ecologist) to conduct flora and fauna assessments of the wetlands. The flora and fauna reports are attached.

At a later date when you require it, we will incorporate these flora and fauna reports into Wetland Characterization Reports, which are the supporting documentation necessary should applications to alter any wetlands be required.

We trust this meets your present requirements.

Respectfully submitted,
Maritime Testing (1985) Limited



Doreen Chenard, B.Sc. in Agr. Manager, Environmental Assessments

Enclosures



Flora Report

Marbicon Inc.

Botanical survey
Washmill Lake Court Extension
Halifax Regional Municipality, NS
2010

Jim Jotcham October 22, 2010 In the late summer of 2009 and again in 2010, Marbicon Inc. was contracted to perform a botanical survey of several small wetlands on the east side of Highway 102 near Bayers Lake. The site is a proposed extension of Washmill Lake Court, in Halifax Regional Municipality. These wetlands were located at approximately 44° 38' 59" N, 63° 40' 04" W. The wetlands surveyed at the client's request were Wetland 4 (surveyed in 2009) and numbers 10 and 11 (surveyed in 2010). Figure 1 is a map provided by the Atlantic Canada Conservation Data Centre (ACCDC) with their report.

The site was inventoried by botanist Jim Jotcham on September 30 and October 1, 2009, and October 8, 2010. Appendix 1 shows the lists of plant species found in each of the three wetlands. Scientific names are from Zinck (1998), with synonyms from Hinds (2000). Common names are from the Nova Scotia Department of Natural Resources (DNR).

Three small apparently unconnected wetlands were surveyed. Most of the sites had well defined flowages, and thus were judged to be fens, with water and associated nutrients flowing in from surrounding slopes. Where flowage was less well defined and the ground cover was mainly sphagnum mosses, the sites were more bog-like in nature, but these sites likely still received significant runoff and were thus defined as fens. All were wooded fens, although wetland number eleven had an open area to the east, with a pond, and wetland 10 was unique for the open expanse of sedges on the east side of the wetland.

No rare or endangered plants were identified. Because of the regular flowage and the peaty substrate, these wetlands are fens. Although spatially separated, all five wetlands were quite similar in species composition and structure, being wooded fens. Figures 2 to 4 show the general habitat of each of the wetlands. The woody dominants were mostly balsam fir (Abies balsamea) and red and black spruce (Picea rubens and Picea mariana), with scattered red maple (Acer rubrum) and occasional larch (Larix laricina). Several American Witch-hazel (Hamamelis virginiana) were seen in flower. The upper shrub layer, where present, included black holly (Ilex verticillata), speckled alder (Alnus incana), and mountain holly (Nemopanthus mucronata). The lower shrub layer typically included sheep laurel (Kalmia angustifolia) and Labrador tea (Ledum groenlandicum). The herbaceous cover was often dominated by cinnamon fern (Osmunda cinnamomea) over a carpet of Sphagnum moss (Sphagnum spp.). The wetlands were fairly open and easy to walk through. The occasional upland plant was usually restricted to drier hummocks. Several red oak seedlings (Quercus rubra) were found in the moss, but these did not seem to develop beyond 2 to 3 years of age. The occasional windfall revealed a high water table, with ponds forming in the cavities that were created when the trees fell over.

No rare or unusual plants were seen. All plants identified on the site have a DNR general status ranking of Green (defined as any species known to be, or believed to be, not at risk). It must be noted that no conclusions may be drawn as to the presence or absence of species more easily seen or identified in other seasons. No specific sampling procedure was followed since the subject wetlands were small enough to sample completely.

Appendix 2 is a summary of the botany portion of the report supplied by the Atlantic Canada Conservation Data Centre (ACCDC). Their list includes sub-national (S) ranks. Some of the species and/or synonym scientific names are not found in Zinck (1998), but can usually be

found in Hinds (2000). The ACCDC list shown is for all rare flora identified within 100 km, with no sorting by habitat. Hence many of the species are not likely to be seen.

For example, the following listed plants are not likely found on site: *Hieracium kalmii* and *Plantago rugelii* are usually on roadside shoulders. Both these species have been found along the highway near the site, but were not identified beside wetland 1 surveyed during the 2009 survey completed for HRM. *Hudsonia ericoides, Juncus greenei, Carex foenea, Carex adusta, Oenothera fruticosa,* and *Polygala polygama* are usually in more dry sandy habitats.

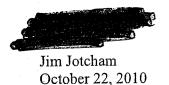
Minuartia groenlandica is usually on granitic ledges and gravels. This habitat was common around wetland number 10, but no plants were found near the wetland.

Among the wetland species, *Euthamia caroliniana* is more usually a plant found along lake shores. *Solidago hispida* is along rocky shores. *Suaeda calceoliformis* is a salt marsh species.

After removing the above unlikely species, there is still a small list of potential plants found within 10 km that could be found on site, but were not. These plants include Ophioglossum pusillum (grassy swamps), Montia fontana (seepy slopes), Empetrum eamesii (bogs and barrens), Hypericum majus (wet or dry open soils), Polygala sanguinea (damp slopes, open woods), Elymus wiegandii (meadows), and Schizaea pusilla (bogs and wet depressions).

In addition to the above vascular plants, two lichens of note have been found within 10 km of the study area. Boreal felt lichen (*Erioderma pedicellatum*) is usually restricted to old growth balsam fir trunks, a habitat not present on site. Ghost antler lichen (*Pseudevernia cladonia*) lives on spruce and fir twigs and branches. Neither of these fairly distinctive species were seen.

The list of potential species is a long one, and is continued in Appendix 2. The probability of finding the listed species generally decreases as the distance of the recorded sightings from the study site increases. However, exceptions exist. A similar review of the remainder of the list revealed that none of the additional plant species listed therein, and not already mentioned in this report, had been found on the site.



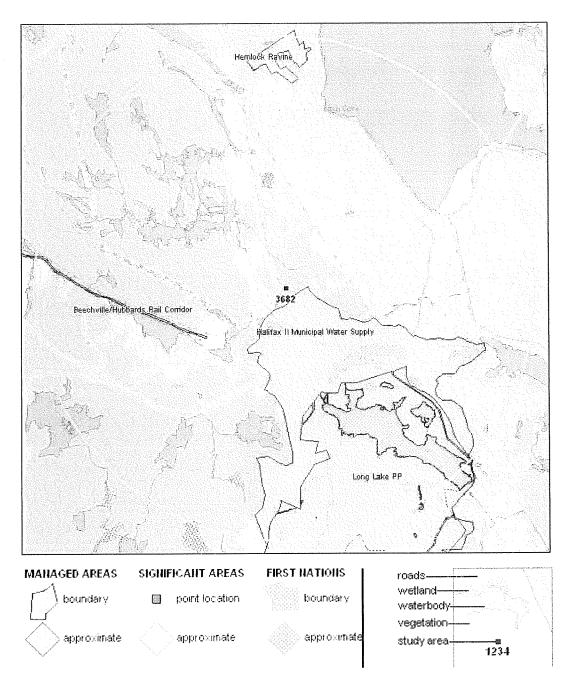


Figure 1. Area map (5 km circle) provided by ACCDC. The centre point is the study area (defined here as No. 3682).



Figure 2. Wetland 4. A wooded fen with a luxuriant carpet of Sphagnum mosses.



Figure 3. Wetland 10. An exposed hilltop fen, dominated by sedges. The fen extends into a wooded area to the west.



Figure 4. Wetland 11. A wooded fen with open water at the outlet flowing east.

Appendix 1. Composite list of species identified on September 30 and October 1, 2009, and October 8, 2010. Scientific names are from Zinck (1998). Bracketed names are current synonyms (also see Hinds, 2000). See Appendix 3 for S-rank definitions.

Wetland 4 (sampled 2009)

Common Name	Binomial	Sub-national status	NSDNR
		(ACCDC)	Status
Balsam Fir	Abies balsamea	S5	Green
Red Maple	Acer rubrum	S5	Green
Wild Sarsaparilla	Aralia nudicaulis	S5	Green
Whorled aster	Aster (= Oclemena) acuminatus	S5	Green
Three-seed sedge	Carex trisperma	S5	Green
Clinton Lily	Clintonia borealis	S5	Green
Dwarf dogwood	Cornus canadensis	S5	Green
Roundleaf sundew	Drosera rotundifolia	S5	Green
American Beech	Fagus grandifolia	S5	Green
Creeping snowberry	Gaultheria hispidula	S5	Green
Teaberry	Gaultheria procumbens	S5	Green
Black Holly	Ilex verticillata	S5	Green
Sheep laurel	Kalmia angustifolia	S5	Green
Common Labrador-tea	Ledum groenlandicum	S5	Green
Wild Lily-of-The-Valley	Maianthemum canadense	S5	Green
Mountain holly	Nemopanthus mucronata	S5	Green
Cinnamon Fern	Osmunda cinnamomea	S5	Green
Black spruce	Picea mariana	S5	Green
Bracken fern	Pteridium aquilinum	S5	Green
Northern red oak	Quercus rubra	S5	Green
Northern pitcher-plant	Sarracenia purpurea	S5	Green
Peat / Sphagnum moss	Sphagnum spp.	N/A	N/A
Northern Starflower	Trientalis borealis	S5	Green
Late lowbush blueberry	Vaccinium angustifolium	S5	Green

Wetland 10

Common Name	Binomial	Sub-national status (ACCDC)	NSDNR Status
Red Maple	Acer rubrum	S5	Green
Paper birch	Betula papyrifera	S5	Green
Tussock sedge	Carex stricta	S5	Green
Dwarf dogwood	Cornus canadensis	S5	Green
Creeping snowberry	Gaultheria hispidula	S5	Green
Teaberry	Gaultheria procumbens	S5	Green
Black Holly	Ilex verticillata	S5	Green
Sheep laurel	Kalmia angustifolia	S5	Green
American larch	Larix laricina	S5	Green
Common Labrador-tea	Ledum groenlandicum	S5	Green
Northern bayberry	Myrica pensylvanica	S5	Green
Mountain holly	Nemopanthus mucronata	S5	Green

Cinnamon Fern	Osmunda cinnamomea	S5	Green
Black spruce	Picea mariana	S5	Green
Bracken fern	Pteridium aquilinum	S5	Green
Northern red oak	Quercus rubra	S5	Green
Northern pitcher-plant	Sarracenia purpurea	S5	Green
Peat / Sphagnum moss	Sphagnum spp.	N/A	N/A
New York Fern	Thelypteris noveboracensis	S5	Green
Late lowbush blueberry	Vaccinium angustifolium	S5	Green
Small cranberry	Vaccinium oxycoccos	S5	Green
Possum-Haw Viburnum	Viburnum nudum	S5	Green

Wetland 11

Common Name	Binomial	Sub-national status (ACCDC)	NSDNR Status
Balsam fir	Abies balsamea	S5	Green
Striped maple	Acer pensylvanicum	S5	Green
Red maple	Acer rubrum	S5	Green
Speckled alder	Alnus incana	S5	Green
Wild Sarsaparilla	Aralia nudicaulis	S5	Green
Whorled aster	Aster (= Oclemena) acuminatus	S5	Green
Parasol white-top	Aster (=Doellingeria) umbellatu	s S5	Green
Paper birch	Betula papyrifera	S5	Green
Long sedge	Carex folliculata	S5	Green
Three-seed sedge	Carex trisperma	S5	Green
Leatherleaf	Chamaedaphne calyculata	S5	Green
Dwarf dogwood	Cornus canadensis	S5	Green
Spinulose shield fern	Dryopteris carthusiana	S5	Green
Trailing arbutus	Epigaea repens	S5	Green
Rough Cotton-Grass	Eriophorum tenellum	S4S5	Green
American Beech	Fagus grandifolia	S5	Green
Creeping snowberry	Gaultheria hispidula	S5	Green
Teaberry	Gaultheria procumbens	S5	Green
Black huckleberry	Gaylussacia baccata	S5	Green
Ink-berry	Ilex glabra	S5	Green
Black Holly	Ilex verticillata	S5	Green
Bruit-fruited rush	Juncus pelocarpus	S5	Green
Sheep laurel	Kalmia angustifolia	S5	Green
American larch	Larix laricina	S5	Green
Common Labrador-tea	Ledum groenlandicum	S 5	Green
Wild Lily-of-The-Valley	Maianthemum canadense	S5	Green
Mountain holly	Nemopanthus mucronata	S5	Green
Bog aster	Oclemena nemoralis	S5	Green
Cinnamon Fern	Osmunda cinnamomea	S5	Green
Royal fern	Osmunda regalis	S5	Green
Black spruce	Picea mariana	S5	Green
Red spruce	Picea rubens	S5	Green
Bracken fern	Pteridium aquilinum	S5	Green
Rhodora	Rhododendron canadense	S5	Green
Blackberry	Rubus allegheniensis	S5	Green

Bristly dewberry	Rubus hispidus	S5	Green
Northern pitcher-plant	Sarracenia purpurea	S5	Green
Bulrush	Scirpus (Trichophorum) cyperinus	S5	Green
American mountain-ash	Sorbus americana	S5	Green
Peat / Sphagnum moss	Sphagnum spp.	N/A	N/A
New York Fern	Thelypteris noveboracensis	S5	Green
Late lowbush blueberry	Vaccinium angustifolium	S5	Green
Small cranberry	Vaccinium oxycoccos	S5	Green
Possum-Haw Viburnum	Viburnum nudum	S5	Green

Appendix 2: Data summary from the Atlantic Canada Conservation Data Centre (ACCDC) report submitted September 25 2009. Only the botanical information is presented here.

Definitions of Provincial (subnational) ranks - SRANKS

- S1 Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.
- S2 Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.
- Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations. (21 to 100 occurrences).
- Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).
- Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.
- S#S# Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).
- SH Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 70 years (depending on the species), and suspected to be still extant.
- SU Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information.
- SX Extinct/Extirpated: Element is believed to be extirpated within the province.
- S? Unranked: Element is not yet ranked.
- SA Accidental: Accidental or casual in the province (i.e., infrequent and far outside usual range). Includes species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.
- SE Exotic: An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.
- SE# Exotic numeric: An exotic established in the province that has been assigned a numeric rank.
- SP Potential: Potential that Element occurs in the province, but no occurrences

reported.

- SR Reported: Element reported in the province but without persuasive documentation which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.
- SRF Reported falsely: Element erroneously reported in the province and the error has persisted in the literature.
- Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. An NZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory. In other words, the migrant regularly passes through the province, but enduring, mappable Element Occurrences cannot be defined.

Plant species of note within 100 km of the Washmill Lake Court site (see Figures 1 and 3):

			Dist -
Scientific Name	Common Name	S-rank	km
Minuartia groenlandica	Mountain Sandwort	S2	01 ±0.1
Carex adusta	Crowded Sedge	S2S3	03 ±5
Ophioglossum pusillum	Adder's Tongue	S2S3	03 ±50.1
Plantago rugelii	Black-Seed Plantain	S1SE	04 ±0.5
Erioderma pedicellatum (Atlantic pop.)	Boreal Felt Lichen	S1S2	04 ±1
Hieracium kalmii var. kalmii	Kalm's Hawkweed	S2?	04 ±5
Montia fontana	Fountain Miner's-Lettuce	S1	06 ±1
Polygala polygama	Racemed Milkwort	S1SE	06 ±1
Juncus greenei	Greene's Rush	S1S2	06 ±10
Pseudevernia cladonia	Ghost Antler Lichen	S2	07 ±0
Carex foenea	Dry-Spike Sedge	S3?	0± 80
Schizaea pusilla	Curly-Grass Fern	S3	08 ±1
Elymus wiegandii	Wiegand's Wild Rye	S1	08 ±10
Empetrum eamesii	Rock Crowberry	S2S3	08 ±10
Euthamia caroliniana	Grass-Leaved Goldenrod	S3	08 ±10
Hudsonia ericoides	Golden-Heather	S2	08 ±10
Hypericum majus	Larger Canadian St. John's Wort	S1	08 ±10
Polygala sanguinea	Field Milkwort	S2S3	08 ±10
Solidago hispida	Hairy Goldenrod	S1?	08 ±10
Suaeda calceoliformis	American Sea-Blite	S2S3	08 ± 10
Oenothera fruticosa ssp. glauca	Shrubby Sundrops	S2SE	09 ±10
Helianthemum canadense	Canada Frostweed	S1	11 ±1
Symphyotrichum undulatum	Wavy-leaf American-Aster	S2	11 ±10
Clethra alnifolia	Coast Pepper-Bush	S1S2	12 ±0.1
Ranunculus sceleratus	Cursed Crowfoot	S1S2	12 ±1
Spiranthes ochroleuca	Yellow Nodding Ladies'-Tresses	S2	12 ±10
Vaccinium uliginosum	Alpine Blueberry	S2	12 ±10
Eleocharis olivacea	Capitate Spikerush	S2	13 ±10
Fraxinus nigra	Black Ash	S3	13 ±10

		000	13 ±5
Hieracium kalmii	Kalm's Hawkweed	S2?	
Empetrum eamesii ssp. atropurpureum	Purple Crowberry	S2S3	14 ±0.5
Empetrum eamesii ssp. eamesii	Purple Crowberry	S2S3	14 ±0.5
Hieracium kalmii var. fasciculatum	Kalm's Hawkweed	S1?	15 ±5
Hypericum dissimulatum	Disguised St. John's-Wort	S2S3	16 ±0.5
Limosella australis	Mudwort	S2S3	16 ±0.5
Thuja occidentalis	Eastern White Cedar	S1S2	16 ±1
Euthamia galetorum	Narrow-Leaf Fragrant Golden-Rod	S3S4	16 ±10
Verbena hastata	Blue Vervain	S3	18 ±10
Sparganium fluctuans	Floating Bur-Reed	S3?	19 ±0.5
Senecio pseudoarnica	Seabeach Groundsel	S2	20 ±10
Bartonia virginica	Yellow Screwstem	S3	21 ±10
Cypripedium parviflorum var. pubescens	Large Yellow Lady's-Slipper	S2	21 ±10
Betula michauxii	Michaux's Dwarf Birch	S2	22 ±10
Hedeoma pulegioides	American Pennyroyal	S2S3	22 ±5
Liparis loeselii	Loesel's Twayblade	S3S4	23 ±5
Potamogeton confervoides	Algae-Like Pondweed	S3S4	24 ±0.1
Goodyera tesselata	Checkered Rattlesnake-Plantain	S3	24 ±1
Eleocharis ovata	Ovate Spikerush	S2?	25 ±0.5
Botrychium lunaria	Moonwort Grape-Fern	S1 -	25 ±5
Crassula aquatica	Water Pigmy-Weed	S2	26 ±0.1
Listera australis	Southern Twayblade	S1	26 ±0.1
Carex pensylvanica	Pennsylvania Sedge	S1S2	27 ±0.1
Piptatherum canadense	Canada Mountain-Ricegrass	S2	27 ±1
Cardamine parviflora var. arenicola	Small-Flower Bitter-Cress	S2	27 ±50.1
Eriophorum gracile	Slender Cotton-Grass	S2	28 ±10
	Button-Bush Dodder	S1	29 ±0.1
Cuscuta cephalanthi	American Germander	S2S3	29 ±0.5
Teucrium canadense		S2	30 ±10
Lactuca hirsuta var. sanguinea	Hairy Wild Lettuce Cut-Leaved Coneflower	S2S3	30 ±10
Rudbeckia laciniata var. gaspereauensis		S2S3	30 ±10
Asclepias incarnata ssp. pulchra	Swamp Milkweed	S2S3	30 ±5
Lycopodiella appressa	Southern Bog Clubmoss	S3 S1	30 ±3 31 ±0.5
Fraxinus pennsylvanica	Green Ash		
Ranunculus flammula var. flammula	Greater Creeping Spearwort	S2	31 ±0.5
Equisetum variegatum	Variegated Horsetail	S3	32 ±0.1
Salix sericea	Silky Willow	S2	32 ±1
Utricularia radiata	Small Swollen Bladderwort	S3	32 ±1
Crataegus submollis	a Hawthorn	S1?	33 ±10
Hieracium umbellatum	Umbellate Hawkweed	S2?	33 ±10
Myriophyllum farwellii	Farwell's Water-Milfoil	S2	33 ±10
Isoetes acadiensis	Acadian Quillwort	S3	35 ±10
Sphagnum torreyanum	a Peatmoss	S2	36 ±0.1
Najas gracillima	Thread-Like Naiad	S1S2	38 ±0.1
Adiantum pedatum	Northern Maidenhair-Fern	S1	38 ±10
Anemone canadensis	Canada Anemone	S2	38 ±10
Caulophyllum thalictroides	Blue Cohosh	S2	38 ±10
Cypripedium parviflorum	Small Yellow Lady's-Slipper	S2S3	38 ±10
Polygonum scandens	Climbing False-Buckwheat	S2	38 ±10
Shepherdia canadensis	Canada Buffalo-Berry	S2	38 ±10
Lilium canadense	Canada Lily	S2S3	39 ±0.1

Bidens connata	Purple-Stem Swamp Beggar-Ticks	S3?	39 ±1
Polygonum raii	Pondshore Knotweed	S2S3SE	40 ±1
Juncus dudleyi	Dudley's Rush	S2?	41 ±1
Juncus subcaudatus	Woods-Rush	S3	41 ±10
Vaccinium caespitosum	Dwarf Blueberry	S2	42 ±0
Dirca palustris	Eastern Leatherwood	S1	42 ±1
Hepatica nobilis var. obtusa	Round-Leaved Liverleaf	S1	42 ±10
Polygonum pensylvanicum	Pennsylvania Smartweed	S3	42 ±10
Packera paupercula	Balsam Groundsel	S3	43 ±0
Botrychium simplex	Least Grape-Fern	S2S3	43 ±0.1
Cypripedium arietinum	Ram's-Head Lady's-Slipper	S1	43 ±0.5
Megalodonta beckii	Beck Water-Marigold	S3	43 ±0.5
Carex albicans var. emmonsii	Emmons Sedge	S3S4	43 ±1
Vallisneria americana	Eel-Grass	S2	43 ±1
Polygonum buxiforme	Small's Knotweed	S2S3SE	43 ±10
Potamogeton zosteriformis	Flatstem Pondweed	S2S3	43 ±5
Carex bromoides	Brome-Like Sedge	S3	44 ±0
Goodyera pubescens	Downy Rattlesnake-Plantain	S1	44 ±0
Lycopodium complanatum	Trailing Clubmoss	S3?	44 ±0
Viola sagittata var. ovata	Arrow-Leaved Violet	S3S4	44 ±0
Asclepias incarnata	Swamp Milkweed	S3	44 ±10
Erigeron hyssopifolius	Daisy Fleabane	S2S3	44 ±10
Dichanthelium clandestinum	Deer-Tongue Witchgrass	S3	44 ±5
Pyrola asarifolia	Pink Wintergreen	S3	44 ±50.1
Antennaria parlinii	a Pussytoes	S1	45 ±0.1
Epilobium coloratum	Purple-Leaf Willow-Herb	S2?	45 ± 0.1
Triosteum aurantiacum	Coffee Tinker's-Weed	S2	45 ±1
Equisetum pratense	Meadow Horsetail	S2	46 ±0
Lycopodium hickeyi	Hickey's Clubmoss	S2?	46 ±0
Elymus hystrix var. bigeloviana	Bottlebrush Grass	S1	46 ±0.5
Carex rosea	Rosy Sedge	S3	46 ±1
Sanguinaria canadensis	Bloodroot	S3S4	46 ±1
Anemone virginiana	Virginia Anemone	S1S2	46 ±10
Anemone virginiana var. virginiana	River Anemone	S2	46 ±10
Cypripedium reginae	Showy Lady's-Slipper	S2	46 ±10
Juncus marginatus	Grassleaf Rush	S2S3	46 ±10
Osmorhiza longistylis	Smoother Sweet-Cicely	S2	46 ±10
Paludella squarrosa	a Moss	S1	46 ±10
Sanicula odorata	Black Snake-Root	S1	46 ±10
Carex tuckermanii	Tuckerman Sedge	S1	46 ±5
Eleocharis nitida	Slender Spike-Rush	S3	46 ±5
Corallorhiza trifida	Early Coralroot	S3	47 ±0
Cystopteris bulbifera	Bulblet Fern	S3S4	47 ±0
Rhamnus alnifolia	Alderleaf Buckthorn	S3	47 ±0.1
Cystopteris tenuis	a Bladderfern	S3?	47 ±0.5
Lindernia dubia	Yellow-Seed False-Pimpernel	S3S4	48 ±0
Panicum philadelphicum	Philadelphia Panic Grass	S2S3SE	48 ±0
Pilea pumila	Canada Clearweed	S1	48 ±0
Carex tenera	Slender Sedge	S1S2	48 ±0.1
Cypripedium parviflorum var. makasin	Small Yellow Lady's-Slipper	S2	48 ±0.1

	B. H. H. H. wattan	C4	48 ±0.1
Hepatica nobilis	Round-Lobe Hepatica	S1	48 ±1
Agrimonia gryposepala	Tall Hairy Groovebur	S3?	48 ±1
Cynoglossum virginianum var. be		S1	48 ±1
Platanthera hookeri	Hooker Orchis	S3	48 ±1
Rumex salicifolius var. mexicanu		S2	48 ±1
Scirpus pedicellatus	Stalked Bulrush	S1	40 ±1
Spiranthes lucida	Shining Ladies'-Tresses	S2	
Desmodium glutinosum	Large Tick-Trefoil	S2	49 ±0
Laportea canadensis	Wood Nettle	S3	49 ±0
Carex hirtifolia	Pubescent Sedge	S2S3	49 ±0.1
Carex lupulina	Hop Sedge	S3	49 ±0.1
Equisetum scirpoides	Dwarf Scouring Rush	S3S4	49 ±0.1
Sphenopholis intermedia	Slender Wedge Grass	S3S4	49 ±0.1
Poa glauca	White Bluegrass	S2S3	49 ±1
Carex bebbii	Bebb's Sedge	S1S2	49 ±5
Salix petiolaris	Meadow Willow	S3	51 ±0
Carex comosa	Bristly Sedge	S2	51 ±5
Sphagnum wulfianum	a Peatmoss	S1	52 ±0.1
Sparganium natans	Small Bur-Reed	S3	52 ±1
Cryptogramma stelleri	Fragile Rockbrake	S1	52 ±10
Dichanthelium linearifolium	Slim-Leaf Witchgrass	S2?	52 ±10
Myriophyllum verticillatum	Whorled Water-Milfoil	S2	52 ±10
Viola canadensis	Canada Violet	S1	52 ±10
Campanula aparinoides	Marsh Bellflower	S3?	53 ±1
Carex livida var. radicaulis	Livid Sedge	S1	53 ±10
Panax trifolius	Dwarf Ginseng	S3	54 ±0.1
Platanthera macrophylla	Large Round-Leaved Orchid	S2	54 ±1
Ribes americanum	Wild Black Currant	S1SE	54 ±1
Stellaria longifolia	Longleaf Stitchwort	S3	55 ±0.1
Utricularia gibba	Humped Bladderwort	S2	56 ±10
Conioselinum chinense	Hemlock Parsley	S2S3	57 ±0.1
Anemone quinquefolia	Wood Anemone	S2	58 ±10
Tiarella cordifolia	Heart-Leaved Foam-Flower	S2	58 ±10
Vaccinium boreale	Northern Blueberry	S2	59 ±10
Proserpinaca palustris var. creb	ora Marsh Mermaid-Weed	S3S4	59 ±5
Spiranthes romanzoffiana	Hooded Ladies'-Tresses	S3S4	59 ±5
Carex castanea	Chestnut-Colored Sedge	S2	60 ± 0
Symphyotrichum ciliolatum	Lindley's Aster	S2S3	60 ±1
Festuca subverticillata	Nodding Fescue	S1S2	60 ±10
Viola nephrophylla	Northern Bog Violet	S2	61 ±10
Alopecurus aequalis	Short-Awn Foxtail	S2S3	64 ±5
Stellaria humifusa	Creeping Sandwort	S2	65 ±0.1
Spiranthes casei var. casei	Case's Ladies'-Tresses	S1	66 ±0.1
Suaeda rolandii	Roland's Sea-Blite	S1?	66 ±10
Sphagnum quinquefarium	a Peatmoss	S1	67 ±0.1
Carex eburnea	Ebony Sedge	S3	67 ±0.5
Carex peckii	White-Tinged Sedge	S2?	67 ±0.5
Odlov pookli			
		S3	67 ±0.5
Milium effusum var. cisatlanticu	ım Tall Millet-Grass	S3 S3?	67 ±0.5 67 ±0.5

Coeloglossum viride var. virescens Long-Bract Green Orchis S2 68 ±1 Iva frutescens ssp. oraria Marsh Elder S2SE 68 ±1 Iva frutescens Big-Leaf Marsh-Elder S2SE 69 ±0 Isoetes lacustris Lake Quillwort S3 69 ±1 Platanthera grandiflora Large Purple-Fringe Orchis S3 69 ±1 Trillium erectum Ill-Scent Trillium S3 69 ±1 Illaeopsis chinensis Eastern Lilaeopsis S1 69 ±10 Potamogeton pulcher Spotted Pondweed S1 69 ±10 Proserpinaca peditnata Comb-Leaved Mermaid-Weed S3 69 ±10 Samolus valerandi ssp. parviflorus Walter Pimpernel S2 69 ±10 Asplenium trichomanes Maidenhair Spieenwort S2 70 ±0.1 Luperia selago Fic Utumbos <t< th=""><th></th><th></th><th>60</th><th>60 ±1</th></t<>			60	60 ±1
Na Trutescens Big-Leaf Marsh-Elder S2SE 69 ±0	~	Long-Bract Green Orchis	S2	68 ±1
Description				
Palatanthera grandiflora	Iva frutescens	_		
Trillium erectum	Isoetes lacustris			
December Combiner	Platanthera grandiflora	Large Purple-Fringe Orchis		
Potamogeton pulcher	Trillium erectum	III-Scent Trillium		
Proserpinaca palustris var. palustris Marsh Mermaid-Weed \$3 69 ±10 Proserpinaca pectinata Comb-Leaved Mermaid-Weed \$3 69 ±10 Samolus valerandi ssp. parviflorus Water Pimpernel \$2 69 ±10 Asplenium trichomanes Maidenhair Spleenwort \$2 70 ±0.1 Epilobium strictum Downy Willow-Herb \$3 71 ±1 Rubus pensilvanicus Pennsylvania Blackberry \$3 71 ±1 Huperzia selago Fir Clubmoss \$153 71 ±1 Puccinellia fasciculata Salt Marsh Goosegrass \$15E 71 ±5 Platanthera flava var. herbiola Pale Green Orchid \$15E 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±10 Potamogeton praelongus White-Stem Pondweed \$37 72 ±5 Conopholis americana Squaw-Root \$15E 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder	Lilaeopsis chinensis	Eastern Lilaeopsis		
Proserpinaca palustris var. palustris Marsh Mermaid-Weed \$17 69 ±10 Proserpinaca pectinata Comb-Leaved Mermaid-Weed \$3 69 ±10 Asplenium trichomanes Maidenhair Spleenwort \$2 69 ±10 Asplenium trichomanes Maidenhair Spleenwort \$2 70 ±0.1 Epilobium strictum Downy Willow-Herb \$37 71 ±1 Hubus pensilvanicus Pennsylvania Blackberry \$37 71 ±1 Huberzia selago Fir Clubmoss \$153 71 ±1 Puccinellia fasciculata Salt Marsh Goosegrass \$152 72 ±0.5 Platanthera flava var. herbiola Pale Green Orchid \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±10.5 Potamogeton praelongus White-Stem Pondweed \$37 72 ±0.5 Conopholis americana Squaw-Root \$152 73 ±10 Patanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$152 74 ±0.5 Cuscuta pentagona Field Dodder	Potamogeton pulcher	Spotted Pondweed		
Proserpinaca pectinata Comb-Leaved Mermaid-Weed \$3 69 ±10 Samolus valerandi ssp. parviflorus Water Pimpernel \$2 69 ±10 Asplenium trichomanes Maidenhair Spleenwort \$2 70 ±0.1 Epilobium strictum Downy Willow-Herb \$3 71 ±1 Rubus pensilvanicus Pennsylvania Blackberry \$37 71 ±1 Hubperzia selago Fir Clubmoss \$153 71 ±1 Puccinellia fasciculata Salf Marsh Goosegrass \$158 71 ±5 Platanthera flava var. herbiola Pale Green Orchid \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±0.5 Potamogeton praelongus White-Stem Pondweed \$37 72 ±0.5 Conopholis americana Squaw-Root \$152 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$152 73 ±10 Cuscuta pentagona Field Dodder \$152 74 ±1 Lycopodium sitchense Dwarf Rattlesnake-Plantain		Marsh Mermaid-Weed		
Samolus valerandi ssp. parviflorus Water Pimpernel \$2 69 ±10 Asplenium trichomanes Maidenhair Spleenwort \$2 70 ±0.1 Epilobium strictum Downy Willow-Herb \$3 71 ±1 Rubus pensilvanicus Pennsylvania Blackberry \$3? 71 ±1 Huperzia selago Fir Clubmoss \$158 71 ±5 Puccinellia fasciculata Salt Marsh Goosegrass \$15E 71 ±5 Platanthera flava var. herbiola Pale Green Orchid \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±0.5 Potamogeton praelongus White-Stem Pondweed \$3? 72 ±0.5 Conopholis americana Squaw-Root \$182 73 ±10 Patanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder \$1SE 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain \$253 74 ±1 Lycopodium sitchense Balometer Rein Orchid \$3 <td>•</td> <td>Comb-Leaved Mermaid-Weed</td> <td></td> <td>69 ±10</td>	•	Comb-Leaved Mermaid-Weed		69 ±10
Asplenium trichomanes Maidenhair Spleenwort \$2 70 ±0.1 Epilobium strictum Downy Willow-Herb \$3 71 ±1 Rubus pensilvanicus Pennsylvania Blackberry \$3? 71 ±1 Huperzia selago Fir Clubmoss \$153 71 ±1 Puccinellia fasciculata Salt Marsh Goosegrass \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±0.5 Platanthera flava var. herbiola Sqreen Orchid \$152 72 ±0.5 Conopholis americana Squaw-Root \$37 72 ±0.5 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$152 73 ±10 Cuscuta pentagona Field Dodder \$152 74 ±0.5 Cuscuta pentagona Field Dodder \$152 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$3? 74 ±1 Desmodium canadense Showy Tick-Trefoil \$1 74 ±1 Listera convallarioides Broad-Leaved Twayblade \$3 74 ±5	· · · · · · · · · · · · · · · · · · ·	Water Pimpernel	S2	69 ±10
Epilobium strictum		Maidenhair Spleenwort	S2	70 ±0.1
Rubus pensilvanicus Pennsylvania Blackberry \$3? 71 ±1 Huperzia selago Fir Clubmoss \$153 71 ±10 Puccinellia fasciculata \$alt Marsh Goosegrass \$15E 71 ±5 Platanthera flava var. herbiola Pale Green Orchid \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±10 Potamogeton praelongus White-Stem Pondweed \$37 72 ±0.5 Conopholis americana Squaw-Root \$152 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder \$15E 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain \$23 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$37 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$37 74 ±1 Lycopodium sitchense Palicerase \$1 74	•	Downy Willow-Herb		71 ±1
Huperzia selago	,	Pennsylvania Blackberry	S3?	71 ±1
Puccinellia fasciculata Salt Marsh Goosegrass S1SE 71 ±5 Platanthera flava var. herbiola Pale Green Orchid S1S2 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty S3 72 ±10 Potamogeton praelongus White-Stem Pondweed S3? 72 ±5 Conopholis americana Squaw-Root S1SZ 73 ±10 Platanthera flavav var. flava Southern Rein Orchid S2 73 ±10 Arabis glabra Tower-Mustard S1SE 74 ±0.5 Cuscuta pentagona Field Dodder S1SE 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain S2S 74 ±1 Lycopodium sitchense Alaskan Clubmoss S3? 74 ±1 Desmodium canadense Showy Tick-Trefoil S1 74 ±1 Dichanthelium acuminatum var. lindheimeri Panic Grass S1? 74 ±5 Listera convallarioides Broad-Leaved Twayblade S3 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely S1 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium </td <td>·</td> <td>Fir Clubmoss</td> <td>S1S3</td> <td>71 ±10</td>	·	Fir Clubmoss	S1S3	71 ±10
Platanthera flava var. herbiola Pale Green Orchid \$152 72 ±0.5 Rhexia virginica Virginia Meadow-Beauty \$3 72 ±10 Potamogeton praelongus White-Stem Pondweed \$37 72 ±5 Conopholis americana Squaw-Root \$152 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder \$15E 74 ±0.5 Goodyera repens Dwarf Rattlesnake-Plantain \$283 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$37 74 ±1 Desmodium canadense Showy Tick-Trefoil \$1 74 ±10 Dishanthelium acuminatum var. lindheimeri Panic Grass \$17 74 ±5 Listera convallarioides Broad-Leaved Twayblade \$3 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely \$1 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium \$1 75 ±1 Amelanchier fernaldii Fernald Serviceberry <td>•</td> <td>Salt Marsh Goosegrass</td> <td>S1SE</td> <td>71 ±5</td>	•	Salt Marsh Goosegrass	S1SE	71 ±5
Rhexia virginica Virginia Meadow-Beauty S3 72 ±10 Potamogeton praelongus White-Stem Pondweed S37 72 ±5 Conopholis americana Squaw-Root S1S2 73 ±10 Platanthera flava var. flava Southern Rein Orchid S2 73 ±10 Arabis glabra Tower-Mustard S1SE 74 ±0.5 Cuscuta pentagona Field Dodder S1SE 74 ±1. Goodyera repens Dwarf Rattlesnake-Plantain S2S3 74 ±1 Lycopodium sitchense Alaskan Clubmoss S37 74 ±1 Desmodium canadense Showy Tick-Trefoil S1 74 ±10 Dichanthelium acuminatum var. lindheimeri Panic Grass S17 74 ±5 Listera convallarioides Broad-Leaved Twayblade S3 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely S1 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium S1 75 ±1 Amelanchier fernaldii Fernald Serviceberry S2? 75 ±10 Gratiola neglecta Clammy Hedge-Hyssop S		Pale Green Orchid	S1S2	72 ± 0.5
Potamogeton praelongus White-Stem Pondweed \$3? 72 ±5 Conopholis americana Squaw-Root \$152 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder \$15E 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain \$253 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$37 74 ±1 Desmodium canadense Showy Tick-Trefoil \$1 74 ±1 Dichanthelium acuminatum var. lindheimeri Panic Grass \$17 74 ±5 Listera convallarioides Broad-Leaved Twayblade \$3 74 ±5 Dishanthelium acuminatum var. lindheimeri Panic Grass \$17 74 ±5 Listera convallarioides Broad-Leaved Twayblade \$3 74 ±5 Dishanthelium acuminatum var. lindheimeri Panic Grass \$17 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely \$1 74 ±5 Dishanthelium acuminatum var. analysimatic		Virginia Meadow-Beauty	S3	72 ±10
Conopholis americana Squaw-Root \$152 73 ±10 Platanthera flava var. flava Southern Rein Orchid \$2 73 ±10 Arabis glabra Tower-Mustard \$15E 74 ±0.5 Cuscuta pentagona Field Dodder \$15E 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain \$283 74 ±1 Lycopodium sitchense Alaskan Clubmoss \$3? 74 ±1 Desmodium canadense Showy Tick-Trefoil \$1 74 ±1 Desmodium canadense Showy Tick-Trefoil \$1 74 ±1 Dichanthelium acuminatum var. lindheimeri Panic Grass \$1? 74 ±5 Dichanthelium acuminatum var. lindheimeri Panic Grass \$1? 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely \$1 74 ±5 Osmorhiza depauperata Blunt-Fruited Sweet-Cicely \$1 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium \$1 75 ±1 Amelanchier fernaldii Fernald Serviceberry \$2? 75 ±1 Gratiola neglecta Clammy Hedge-Hyssop	_	•	S3?	72 ±5
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Arabis glabra Tower-Mustard S1SE 74 ±0.5 Cuscuta pentagona Field Dodder S1SE 74 ±1 Goodyera repens Dwarf Rattlesnake-Plantain S2S3 74 ±1 Lycopodium sitchense Alaskan Clubmoss S3? 74 ±1 Desmodium canadense Showy Tick-Trefoil S1 74 ±5 Dichanthelium acuminatum var. lindheimeri Panic Grass S1? 74 ±5 Listera convallarioides Broad-Leaved Twayblade S3 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium S1 75 ±1 Amelanchier fernaldii Fernald Serviceberry S2? 75 ±10 Gratiola neglecta Clammy Hedge-Hyssop S1 76 ±0.1 Salix pedicellaris Bog Willow S2 76 ±0.1 Carex pellita Woolly Sedge S1 77 ±10 Symphyotrichum tradescantii Tradescant Aster S3 78 ±0.1 Erigeron philadelphicus Philadelphia Fleabane S2 78 ±1 Symphyotrichum boreale Boreal American-Aster S2? 78 ±10 Platanthera flava Southern Rein-Orchid S2 79 ±0 Botrychium lanceolatum var. angustisegmentum Hieracium paniculatum Coastal-Plain Blue-Eyed-Grass S1 79 ±0.1 Zizia aurea Common Alexanders S1S2 79 ±1 Cyperus dentatus Common Alexanders S1S2 79 ±1 Cyperus dentatus Toothed Sedge S1 80 ±10 Polystichum braunii Braun's Holly-Fern S3S4 80 ±10 Lobelia spicata Pale-Spiked Lobelia S1S2SE 80 ±10 Lobelia spicata	·	•	S2	73 ±10
Cuscuta pentagona Goodyera repens Dwarf Rattlesnake-Plantain S2S3 74 ±1 Lycopodium sitchense Alaskan Clubmoss S3? 74 ±1 Desmodium canadense Showy Tick-Trefoil Dichanthelium acuminatum var. lindheimeri Listera convallarioides Broad-Leaved Twayblade S3 74 ±5 Dichanthelium xanthophysum Slender Dichanthelium S1 Amelanchier fernaldii Gratiola neglecta Carex pellita Symphyotrichum tradescantii Tradescant Aster Symphyotrichum boreale Platanthera flava Botrychium lanceolatum var. angustisegmentum Hieracium paniculatum Sisyrinchium fuscatum Carex pelosita Sisyrinchium fuscatum Coastal-Plain Blue-Eyed-Grass S1? 74 ±1 Tothed Sweet-Cicely S1 74 ±5 Symphyotrichum tradescantii Fernald Serviceberry S2? 75 ±10 Clammy Hedge-Hyssop S1 76 ±0.1 Tradescant Aster S3 78 ±0.1 Tradescant Aster S3 78 ±0.1 Erigeron philadelphicus Philadelphia Fleabane S2 78 ±1 Symphyotrichum boreale Boreal American-Aster S2? T8 ±1 Symphyotrichum boreale Boreal American-Aster S2? T8 ±1 Symphyotrichum boreale Coastal-Plain Blue-Eyed-Grass S1 79 ±0.1 Zizia aurea Common Alexanders S1S2 T9 ±0.1 Zizia aurea Common Alexanders S1S2 T9 ±0.1 Polystichum braunii Polystichum braunii Polystichum braunii Pries' Pondweed S2 80 ±10 Lobelia spicata S1S2SE 80 ±10 Lobelia spicata			S1SE	74 ±0.5
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Dichanthelium acuminatum var. lindheimeri Listera convallarioides Osmorhiza depauperata Dichanthelium xanthophysum Amelanchier fernaldii Grass Broad-Leaved Twayblade Signature fernaldii Fernald Serviceberry Signature fernaldii Fernald Serviceberry Signature fernaldii Gratiola neglecta Salix pedicellaris Supmphyotrichum tradescantii Erigeron philadelphicus Lophiola aurea Symphyotrichum boreale Platanthera flava Botrychium lanceolatum var. angustisegmentum Hieracium paniculatum Signaturea Common Alexanders Signaturea Cyperus dentatus Carex haydenii Polystichum braunii Potamogeton friesii Fries' Pondweed Sisysinchiam fedestraw Sisysinchiam suminimum palescandi Fries' Pondweed Sisysinchiam suminimum palescandi Sisysinchiam boreale Northern Bedstraw Sisysinchiam braunii Polescand Asser Signaturea Cloud Sedge Signaturea Signaturea Cloud Sedge Signaturea Signaturea Cloud Sedge Signaturea Signaturea Cloud Sedge Signaturea Cloud Sedge Signaturea Signaturea Cloud Sedge Signaturea Cloud Se	•			74 ±10
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	Divelle Cue Driveres	S3	80 ±10
Primula laurentiana	Bird's-Eye Primrose	S2	80 ±10
Saxifraga paniculata ssp. neogaea	a White Mountain Saxifrage	S2 S3?	80 ±10
Potamogeton richardsonii	Redhead Grass	53 <i>!</i> S1	80 ±3 81 ±0.1
Podostemum ceratophyllum	Threadfoot	S2	81 ±0.1
Alnus serrulata	Brook-Side Alder	S2 S1	81 ±5
Equisetum palustre	Marsh Horsetail		82 ±0.1
Carex hystericina	Porcupine Sedge	S1S2	
Cephalanthus occidentalis	Common Buttonbush	S2S3	82 ±10
Primula mistassinica	Bird's-Eye Primrose	S2	83 ±1
Iris prismatica	Slender Blue Flag	S1	83 ±100
Hieracium robinsonii	Robinson's Hawkweed	S2	84 ±1
Atriplex acadiensis	Maritime Saltbush	S1?	84 ±10
Lycopodium sabinifolium	Ground-Fir	S3?	85 ±0.1
Allium schoenoprasum var. sibiricum	Wild Chives	S2	85 ±10
Anemone virginiana var. alba	River Anemone	S1S2	85 ±10
Platanthera orbiculata	Large Roundleaf Orchid	S3	85 ±10
Luzula parviflora	Small-Flowered Wood-Rush	S3	86 ±0
Polypodium appalachianum	Appalachian Polypody	S3?	86 ±0
Allium tricoccum	Small White Leek	S1	86 ±0.1
Carex argyrantha	Hay Sedge	S3S4	86 ±0.1
Arabis drummondii	Drummond Rockcress	S2	86 ±1
Carex laxiflora var. laxiflora	Loose-Flowered Sedge	S1	86 ±1
Desmatodon obtusifolius	a Moss	S1	86 ±1
Draba arabisans	Rock Whitlow-Grass	S2	86 ±1
Floerkea proserpinacoides	False Mermaid-Weed	S2S3	86 ±1
Crataegus robinsonii	a Hawthorn	S1?	86 ±5
Carex prairea	Prairie Sedge	S1	87 ±1
Trillium grandiflorum	Large-Flower Trillium	S1SE	87 ±1
Asplenium trichomanes-ramosum	Green Spleenwort	S2	87 ±10
Carex tribuloides	Blunt Broom Sedge	S3S4	88 ±0
Arabis hirsuta var. pycnocarpa	Hairy Rock-Cress	S1S2	88 ±0.1
Draba glabella	Rock Whitlow-Grass	S1	88 ±0.1
Juncus secundus	Secund Rush	S1	88 ±0.1
Impatiens pallida	Pale Jewel-Weed	S2	88 ±1
Polygonum arifolium	Halberd-Leaf Tearthumb	S2	88 ±10
Pyrola minor	Lesser Wintergreen	S2	88 ±10
Trisetum spicatum	Narrow False Oats	S3	88 ±5
Carex plantaginea	Plantain-Leaved Sedge	S1	89 ±0.1
Timmia megapolitana	a Moss	S1	89 ±1
Botrychium dissectum	Cutleaf Grape-Fern	S3	90 ±0
Lysimachia thyrsiflora	Water Loosestrife	S3S4	90 ±0.1
Rhodobryum ontariense	a Moss	S2	91 ±0.1
Woodsia glabella	Smooth Woodsia	S2	91 ±10
Dichanthelium spretum	Eaton's Witchgrass	S3S4	93 ±0
Myriophyllum humile	Low Water-Milfoil	S3?	93 ±0
Panicum rigidulum var. pubescens	Redtop Panic Grass	S2	93 ±10
Lachnanthes caroliana	Carolina Redroot	S1	94 ±0
Rosa palustris	Swamp Rose	S3	94 ±0
Isoetes prototypus	Prototype Quillwort	S2	94 ±0.1
Proserpinaca intermedia	Intermediate Mermaid-Weed	S1S2	94 ±1

Sisyrinchium angustifolium	Pointed Blue-Eyed-Grass	S3S4	95 ±0.5
Sisyrinchium atlanticum	Eastern Blue-Eyed-Grass	S3	95 ±0.5
Dryopteris fragrans var. remotiuscula	Fragrant Fern	S2	95 ±1
Samolus valerandi	Valerand's Brookweed	S2	96 ±0
Utricularia subulata	Zigzag Bladderwort	S3	96 ±0
Scirpus longii	Long's Bulrush	S2	96 ±0.1
Cardamine maxima	Large Toothwort	S1	97 ±0
Geocaulon lividum	Northern Comandra	S2S3	97 ±0.1
Carex garberi	Elk Sedge	S1	98 ±0
Rudbeckia laciniata	Cut-Leaved Coneflower	S2S3	98 ±0
Piptatherum pungens	Slender Mountain-Ricegrass	S2	98 ±1
Carex atratiformis	Black Sedge	S2	99 ±1
Decodon verticillatus	Hairy Swamp Loosestrife	S2S3	100 ±0
Eupatorium dubium	Joe-Pye Thoroughwort	S2	100 ±10

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Fauna Report

Ecological Characterization of Wetland Habitats Associated with PID 41177379 on the North Side of Washmill Lake Ct. Extension, HRM

John Wile, Wetland Consultant, September 2010

Introduction

An extension of Washmill Lake Ct. through highway 102 to connect the communities of Bayers Lake and Fairview is being constructed. On September 21, 2010 three wetlands situated on property PID # 41177379 located north of this road construction site were investigated. This report describes the habitat features of the three wetlands in question, 4, 10 and 11, based in part upon a site visit made on September 21, 2010. It provides a review of the results of the Atlantic Canada Conservation Data Centre (ACCDA) 100 km radius search, as it relates to the less common vertebrate fauna that might use the wetland habitats described here. It also describes the observed and expected use by more common vertebrate wildlife species, based on the September 2010 and September 2009 site visits, other data sources and the general knowledge of the consultant in understanding wildlife

Observed and Expected Use of the Wetland Habitats by Vertebrate Wildlife

The small wetlands and surrounding forest would provide some breeding habitat for a variety of migratory song birds including those that prefer mixed forest habitats. The wetlands themselves are small and lack the dense understory of shrubs that many birds seem to prefer. The timing of this site visit would not have captured breeding bird activity, but would coincide fairly well with fall song bird migration. Very strong wind conditions prevented hearing birds that may have been vocalizing. The same strong wind may also have grounded birds that may otherwise have been seen flying. Therefore, only a few species were identified during the brief Sept. 21, 2010 visit. Birds observed during the site visit were American goldfinch, Hermit thrush, Northern flicker, Black - capped Chickadee, Red-breasted Nuthatch, Blue Jay, Dark-eyed Junco, American Robin, Common Raven and American Crow.

The wetland may be used occasionally by mammals such as *White tailed deer, Raccoon, Fox, Coyotes, Snowshoe Hare, Voles, Shrews, and even Black Bear* as they travel through or forage in and around them. Evidence of deer, raccoon, red squirrel and hare was found. The lack of permanent surface water and marsh conditions, typical wetland dependent mammal species such as *Muskrat, beaver and mink* would not be permanent residents.

With little or no permanent surface water and the likelihood that vernal pools for the most part being absent, it is doubtful if amphibians would use these small wetlands as breeding habitat. Neither is this preferred habitat for reptiles.

The wetlands contain no fish habitat and no fish species were seen during the site visit.

Further discussion on vertebrate species observations is included below in a review of the ACCDC data base.

Review of the ACCDC information:

For the purposes of this report, it is felt that the ACCDC data and review completed by the consultant in 2009 for similar wetlands found on the road alignment or just to the south of it applies to these set of wetlands located only a few meters away being investigated now in 2010. The review completed in 2009 follows:

The Atlantic Canada Conservation Data Centre's 100 km radius search of the wetland revealed 2683 records of 429 taxa from 74 sources, which is a relatively low density of data (0.09 records / km ²). It is important to note that the search of ACCDC data base targeted the less common species either with COSEWIC or Provincial listing or with a provincial "S" rank of 3 or less and so does not include many of the more common vertebrate species that could be present in and around the wetland. The 100 km search included many natural landscapes dissimilar to this including marine and coastal habitats associated with the Atlantic Ocean, the Upper Bay of Fundy and remote inland wilderness areas. As a result, many of the species recorded in the data base search would not be expected to be found in the subject area. In addition to habitat preferences, the possibility of any particular species listed in the ACCDC search being present in these wetlands or associated habitats is based to some extent on the number of observations for that species and the distance they are from the subject wetland.

The following comments deal with the 972 records of 78 vertebrate fauna observations, with which the consultant is most familiar. 15 vertebrate species have various levels of COSEWIC and 12 have various levels of Provincial listings. COSEWIC listings deal with the national status of species and can often differ from the status applied at the provincial level. This may be due to a particular species being abundant nationally, but not locally or the opposite where provincially they can be abundant, but nationally are rare or in decline.

None of the 15 COSEWIC and 12 Provincially listed vertebrate species could be expected to depend upon these wetland habitats for survival. However, *Wood Turtle, Peregrine Falcon, Moose,* and *Rusty Blackbird* have been observed close (22km or less) to the subject area. Each of these species could by chance be seen, but this would be rare. The Rusty Blackbird does nest in forested swamps and wetlands and has been sighted within 2 km of the area. More detailed discussion of the ACCDC search data is found below:

<u>Birds:</u> The vast majority of the 78 vertebrate species listed in the search are bird species. Of these, most can be eliminated as being dependent on the subject wetland because of their preference to other types of habitats or because of the fact that few have been sighted and at a great distance away. For example, most of the shorebird and water bird species observations within the 100km radius search would have come from coastal or open water marsh habitats and would not be expected to use the forested wetlands being reviewed here. Many of the song birds listed in the ACCDC search report are not forest dwellers and so would be unlikely to

be seen here. In addition to the *Rusty Blackbird*, mentioned above, the *Scarlet Tanager*, *Eastern Phoebe*, *Wood Thrush*, *Brown Thrasher and Warbling Vireo* have been seen within 10 km of the site and prefer, to some extent, this type of habitat. The *Peregrine Falcon* could possibly be seen in the area, but would not depend upon this particular habitat for survival. 7 sightings are listed within 22 km or so from the site. These would probably be migrating birds found along the Atlantic coast. The *Northern Goshawk* would be a rare sight in this urban setting, but could be seen by chance. *Red Crossbills* with a provincial S rank of 3 have been observed within 5 km, but prefer mature conifers with seed cones as a food source, which seem to be absent near these wetland sites. The ranges of some of the bird species, such as the Brown Thrasher, seem to be expanding, possibly due to climate change and so may become more common in the area over time. None of the waterfowl species listed would be expected to be seen in this wetland, instead preferring marine or large open marsh habitats.

Mammals: The Nova Scotia Mainland Moose is endangered and is found in low numbers east of the subject wetland in the Protected Wilderness Areas, which would have been in the range of this data search. While 5 observations of moose are listed within 9 km, it is not known when these were made. 3 Southern Flying Squirrel sightings have been recorded within 73 km of the wetland. 1 Long-tailed Shrew sighting was recorded 91 km or so from this wetland and are a part of a disjunct population of Arctic Shrew. While they prefer wetland habitats, the isolation of this wetland within the much altered urban landscape would likely prevent the shrews from being present. A few sightings of the Hoary, Eastern Pipistrelle and Northern Long-eared Bat have been recorded 20-30 km of the wetland. While perhaps seen flying over the wooded swamp, they would not depend upon it for breeding or roosting habitats.

<u>Fish:</u> Atlantic Whitefish, Atlantic Sturgeon, Stripped Bass, and Atlantic Salmon are listed in the data search, but none would be present in this environment.

Reptiles and Amphibians:

It is highly unlikely that any of the amphibian and reptile species listed would have been or would be present in these wetlands. *The four toed salamander* lays its eggs on land and so is not as dependent upon wetlands as other salamanders, The *Leatherback Turtle* is a marine species and therefore not of concern here.

Of interest are the 42 sightings of The *Wood Turtle*, as close as 4 km or so of this area. They prefer large river floodplain habitats rather than small isolated urban shrub swamp wetlands such as this. They do have the tendency to travel over land and can sometimes be found in unusual places. Given the amount of busy urban infrastructure around this wetland, it would by highly unlikely to find a Wood Turtle here.

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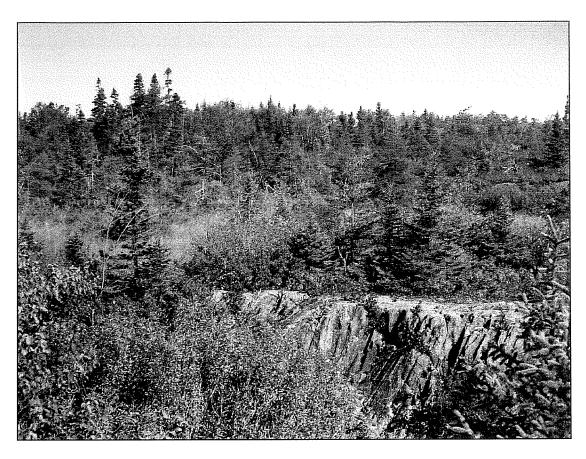
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Consultant's background: John Wile is a wildlife biologist under contract doing conservation biology and as a consultant dealing with environmental impact assessments with a focus on wetlands and birds. John has an undergraduate degree in biology from Acadia University and worked many years in the Atlantic Provinces as a wetland / waterfowl biologist with Ducks Unlimited Canada.

Images: (taken Sept. 21, 2010)



Wetland #4



Wetland # 10



Wetland # 11