

APPENDIX A

Explanation of ACCDC Rarity Ranks



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Understanding Ranks

Sub-national (provincial) ranks (S-ranks)

Conservation Data Centres and NatureServe use existing information and expertise, for ranking species rarity or conservation status. Ranks help them identify gaps in knowledge for species for which element occurrence data are maintained; typically information is maintained for species ranked critically imperiled (S1) to vulnerable (S3) in given jurisdictions. Individual CDCs are responsible for developing sub-national ranks for their area. The AC CDC works with provincial and federal experts to develop rarity ranks for species in each of the following provinces: New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland & Labrador. Factors considered when ranking include: number of element occurrences, distribution, population size, abundance trends, and threats.

Sub-national element rank definitions

The following definitions refer to species and community ranks at sub-national (provincial) levels. Sub-national ranks are specific to a province. Therefore, a species that is common (S4) in New Brunswick, could be ranked as extremely rare (S1) in Prince Edward Island.

S-rank	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 state/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 nation or state/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 - Nation or state/province 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).
Not Provided	Species is not known to occur in the province.

Breeding Status Qualifiers

Qualifier	Definition
B	Breeding - Conservation status refers to the breeding population of the species in the province.
N	Nonbreeding - Conservation status refers to the non-breeding population of the species in the province.
M	Migrant - Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

Note: A breeding status is only used for species that have distinct breeding and/or non-breeding populations in the province. A breeding-status S-rank can be coupled with its complementary non-breeding-status S-rank if the species also winters in the nation or state/province, and/or a migrant-status S-rank if the species occurs regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. The two (or rarely, three) status ranks are separated by a comma (e.g., "S2B, S3N" or "SHN, S4B, S1M").

Other Qualifiers

Qualifier	Definition
?	Inexact or Uncertain - Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

National and Global Ranks

Information supporting S-ranks in turn supports broader-scale ranking, national (N-rank) and global (G-rank). Canadian CDCs, from the Atlantic to British Columbia, help develop and update N-ranks for Canadian plants and animals. Although many believe that National ranks offer great value, there is increasing interest in categories used by COSEWIC and General Status Assessments, outlined briefly below. Global ranks are assigned by staff specialists at NatureServe in consultation with CDC specialists and other science experts. Global rank definitions are similar to sub-national rank definitions but they refer to the entire range for species or communities regardless of national borders. For instance, G1= Critically Imperiled - extremely rare and extremely vulnerable to extinction due to natural or human causes (5 or fewer global occurrences or less than 1000 individuals), while G5 = Demonstrably secure. See the [NatureServe explorer](#) for additional details.

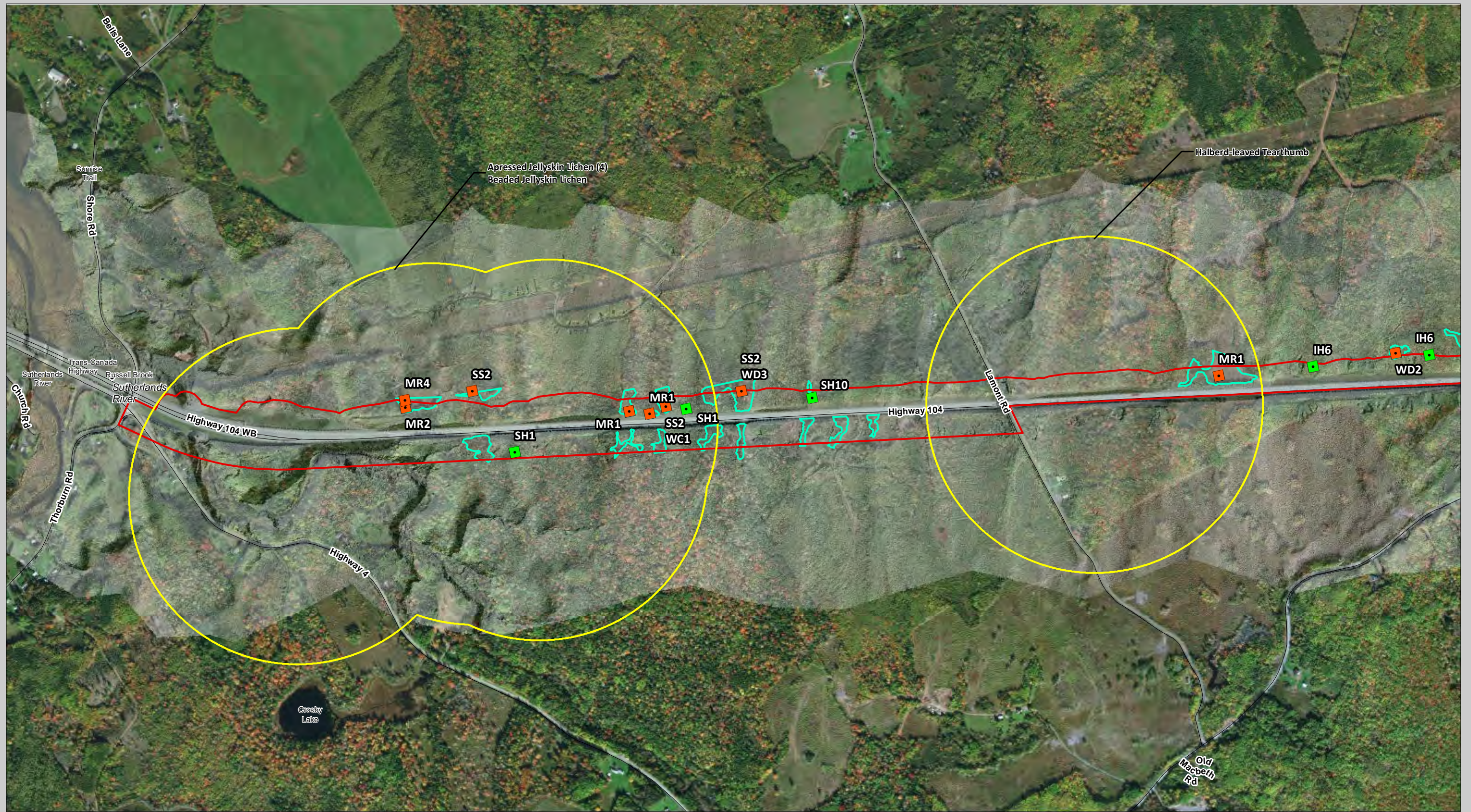
COSEWIC and General Status of Wild Species

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) uses: extinct, extirpated, endangered, threatened, vulnerable, special concern, insufficient information, and secure to describe the status of species (but not communities) in Canada. The General Status of Wild Species in Canada, uses a ranking system similar to that used by NatureServe and all CDCs. (See [Wild Species: The General Status of Species in Canada](#) - for additional details).

APPENDIX B

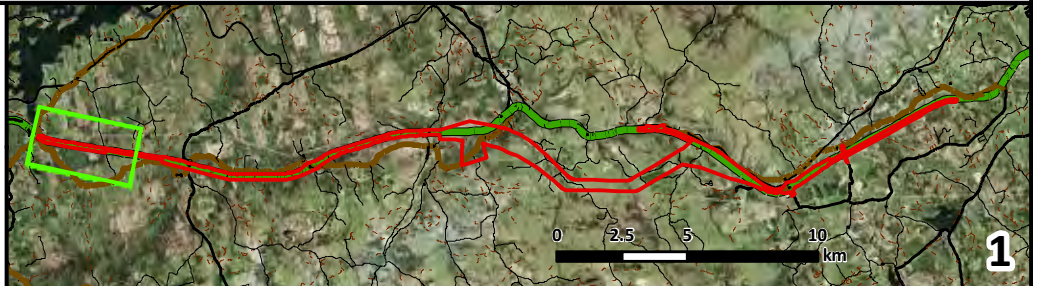
Rare Species and Vegetation Mapping

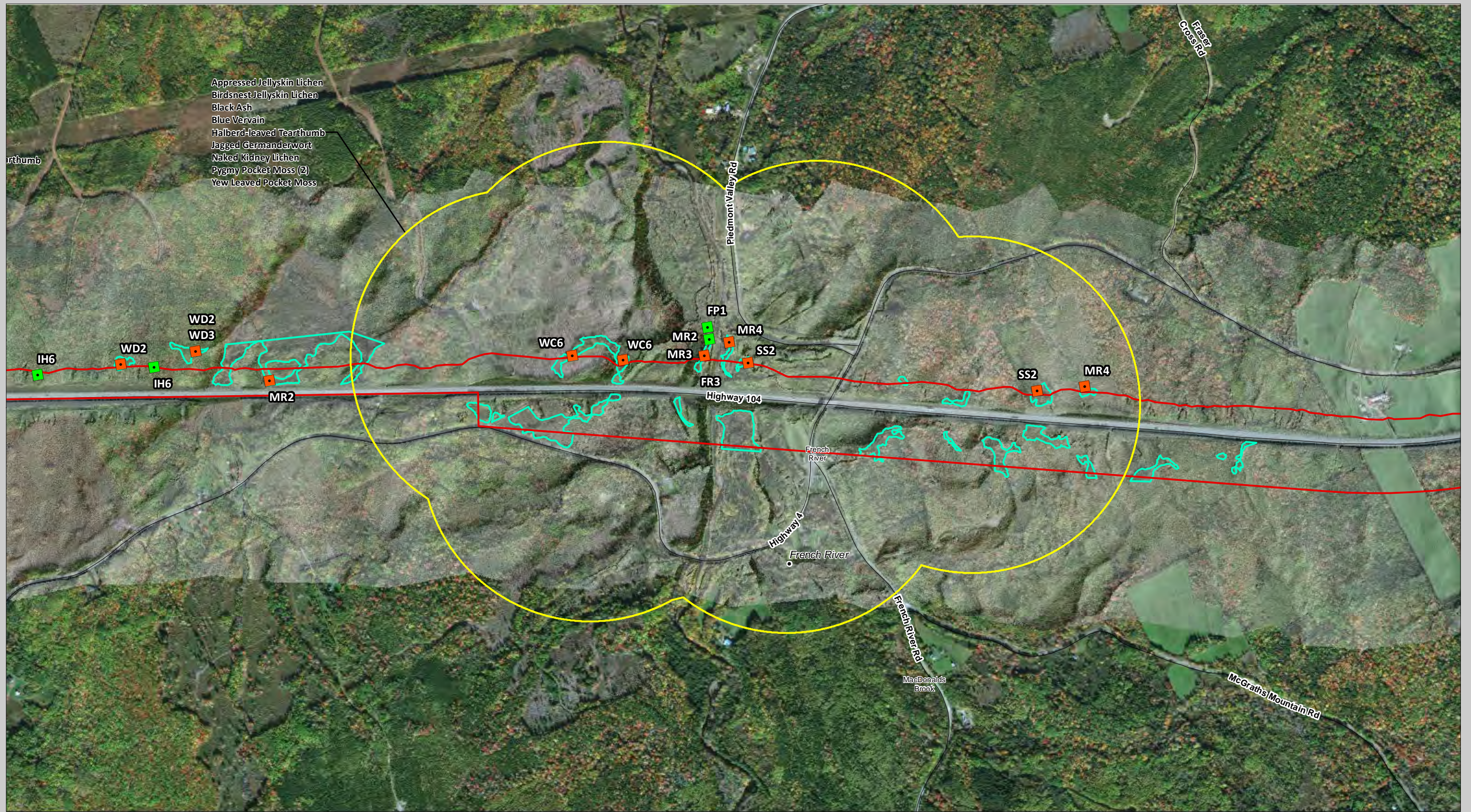
Vegetation Types (VTs)	Source of Category
<ul style="list-style-type: none"> • IH6 – White Birch / Red maple / Sarsaparilla / Bracken 	Neily et al., 2010
<ul style="list-style-type: none"> • OF1 – White spruce / Aster / Goldenrod / Shaggy moss • OF5 – Trembling aspen / Grey birch / Rough goldenrod / Strawberry 	Neily et al., 2010
<ul style="list-style-type: none"> • MW3 – Hemlock – Yellow birch / Evergreen wood fern 	
<ul style="list-style-type: none"> • SH1 – Hemlock / Pin cushion moss / Needle carpet • SH10 – White spruce / Balsam fir / Broom moss 	Neily et al., 2010
<ul style="list-style-type: none"> • TH1a – Sugar maple / Hay-scented fern • TH1b – Yellow Birch / Hay-scented Fern • TH2 – Sugar maple / New York fern / Northern beech fern • TH3 – Sugar maples / White Ash / Christmas fern 	Neily et al., 2010
<ul style="list-style-type: none"> • FP1 – Sugar maple / White ash / Ostrich fern / Wood goldenrod 	Neily et al., 2010
<ul style="list-style-type: none"> • WC1 – Black Spruce / Cinnamon Fern / Sphagnum • WC6 – Balsam Fir / Cinnamon Fern / Three-seeded Sedge / Sphagnum • WC8 – Hemlock / Cinnamon Fern / Sensitive fern / Sphagnum 	Neily et al., 2010
<ul style="list-style-type: none"> • WD2 – Red Maple / Cinnamon Fern / Sphagnum • WD3 – Red Maple / Sensitive Fern / Lady fern / Sphagnum 	Neily et al., 2010
<ul style="list-style-type: none"> • FR2 – Mesic Herbaceous River Channel • FR3 – Twisted Sedge Low Riverbank 	Adapted from Sperduto & Nichols (2011)
<ul style="list-style-type: none"> • MR1 – Cattail Marshes • MR2 – Tall Graminoid Meadow Marshes • MR4 – Short Graminoid / Forb Meadow Marsh 	Adapted from Sperduto & Nichols (2011)
<ul style="list-style-type: none"> • FS3 – Northern Hardwood Seepage Forest 	Adapted from Sperduto & Nichols (2011)
<ul style="list-style-type: none"> • SS1 – Alder Alluvial Shrubland • SS2 – Alder Seepage 	Adapted from Sperduto & Nichols (2011)



▭ Rare Flora Sighting Regions*
▭ Delineated Wetland Area
▭ Documented Vegetation Communities
■ Upland Veg. Community
■ Wetland Veg. Community
▭ Study Area

*Note: Precise locations of non-mobile Species of Conservation Concern (i.e., Flora) have been obscured at NSDNR's request.





- Appressed Jellyskin Lichen
- Birdsnest Jellyskin Lichen
- Black Ash
- Blue Vervain
- Halberd-leaved Tearthumb
- Jagged Germanderwort
- Naked Kidney Lichen
- Pygmy Pocket Moss (2)
- Yew Leaved Pocket Moss

1

3



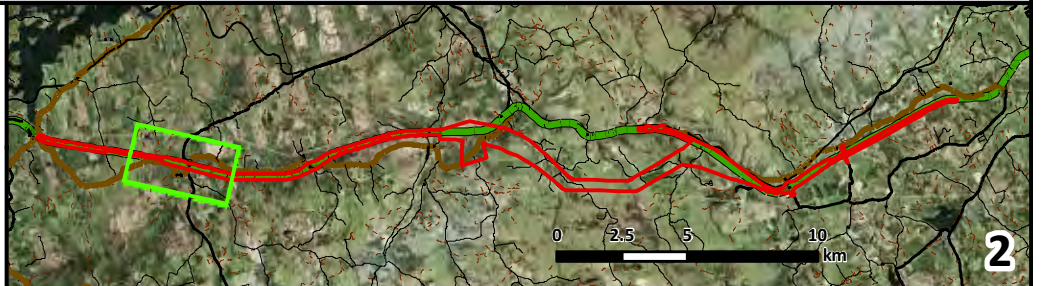
Highway 104
Sutherlands River to Antigonish
Rare Vegetation and
Documented Veg. Communities

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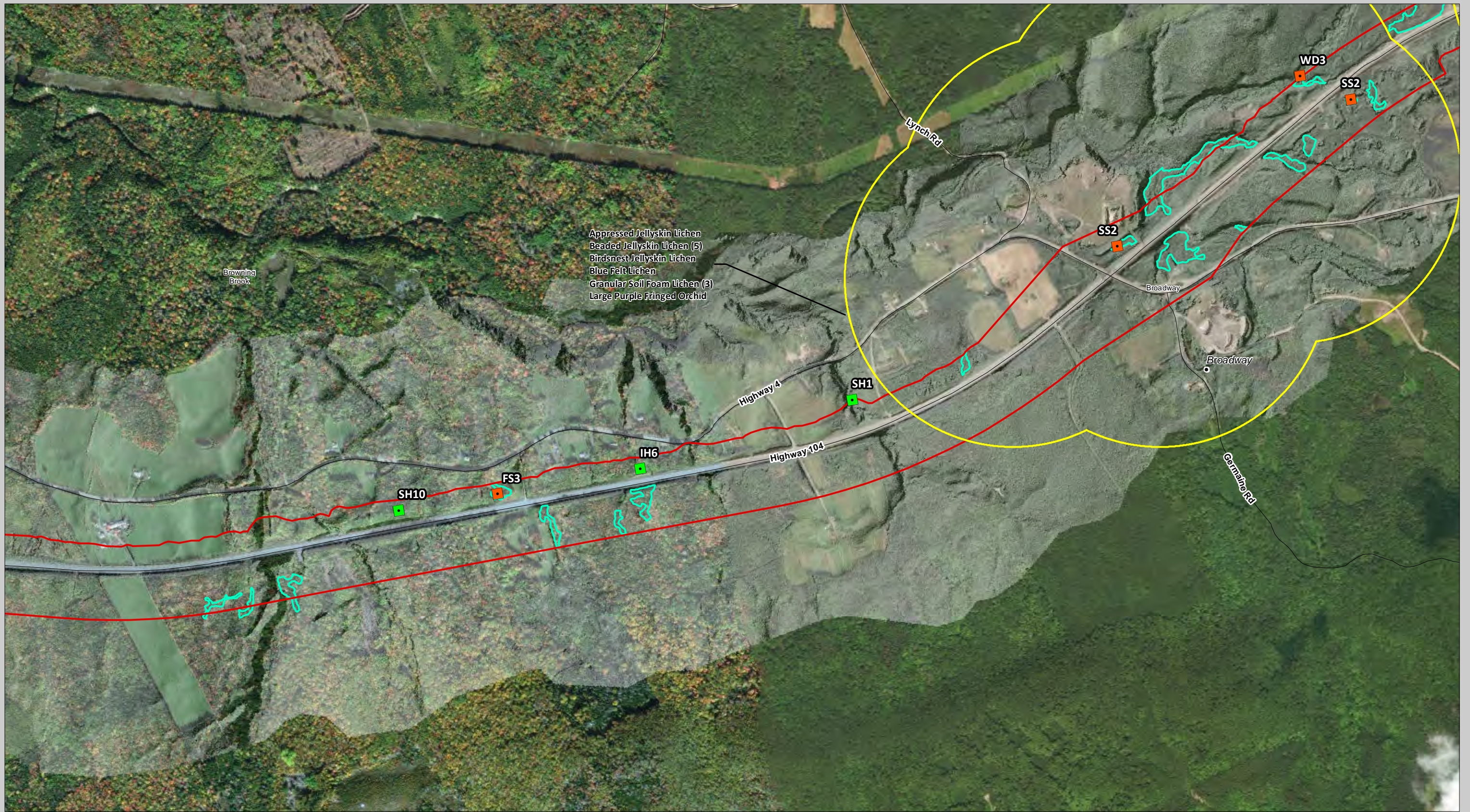
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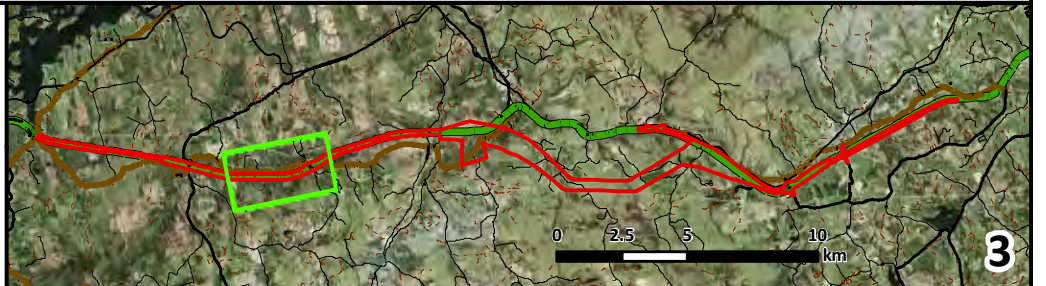


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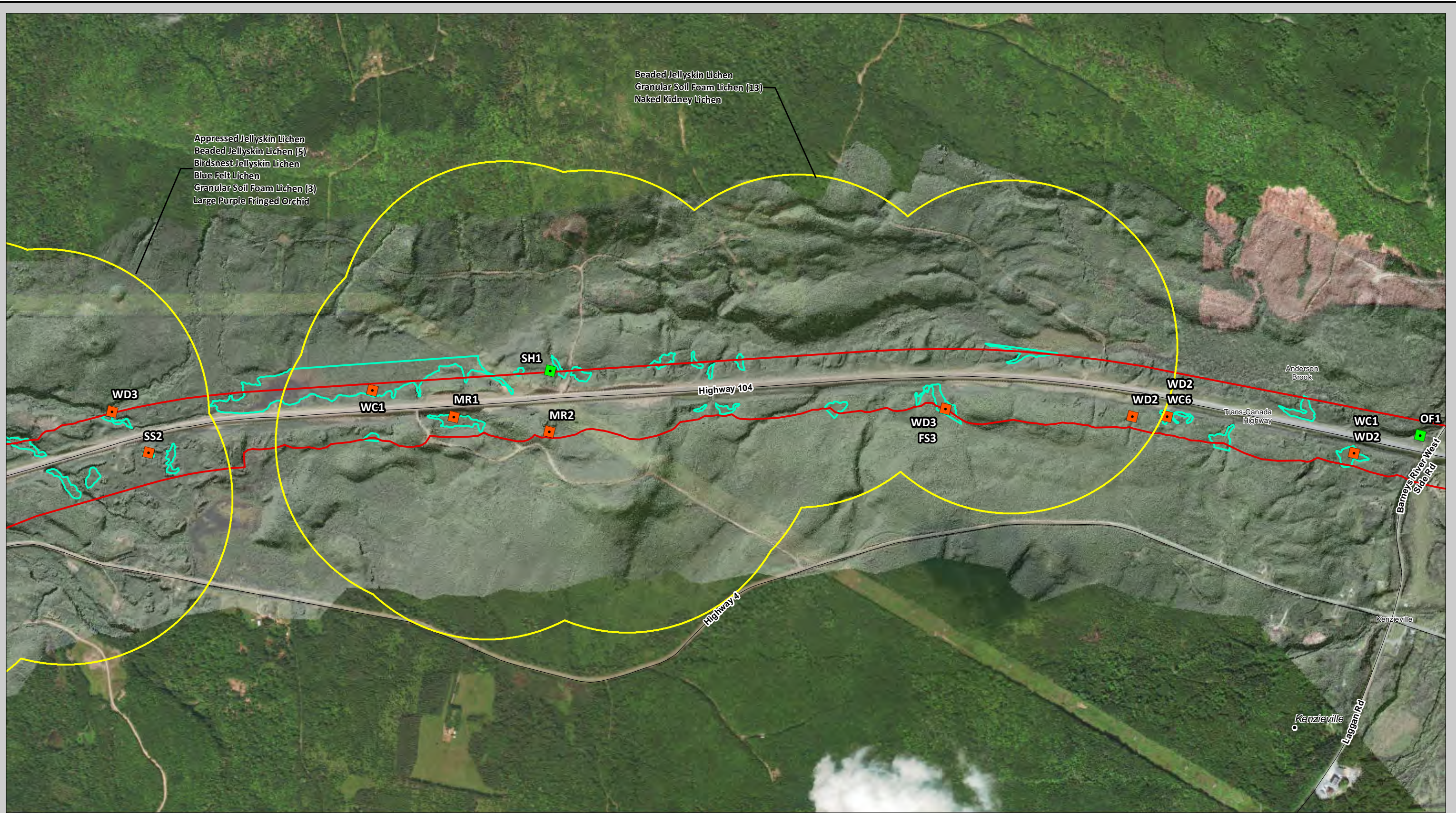


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4



3



Appressed Jellyskin Lichen
 Beaded Jellyskin Lichen (5)
 Birdsnest Jellyskin Lichen
 Blue Felt Lichen
 Granular Soil Foam Lichen (3)
 Large Purple Fringed Orchid

Beaded Jellyskin Lichen
 Granular Soil Foam Lichen (13)
 Naked Kidney Lichen

3

5



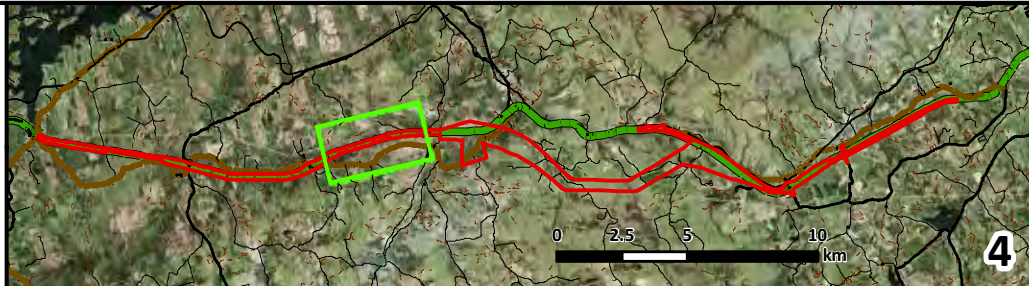
Highway 104
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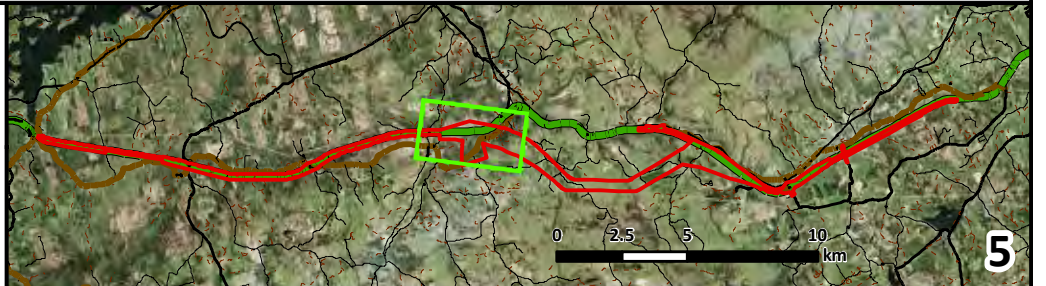
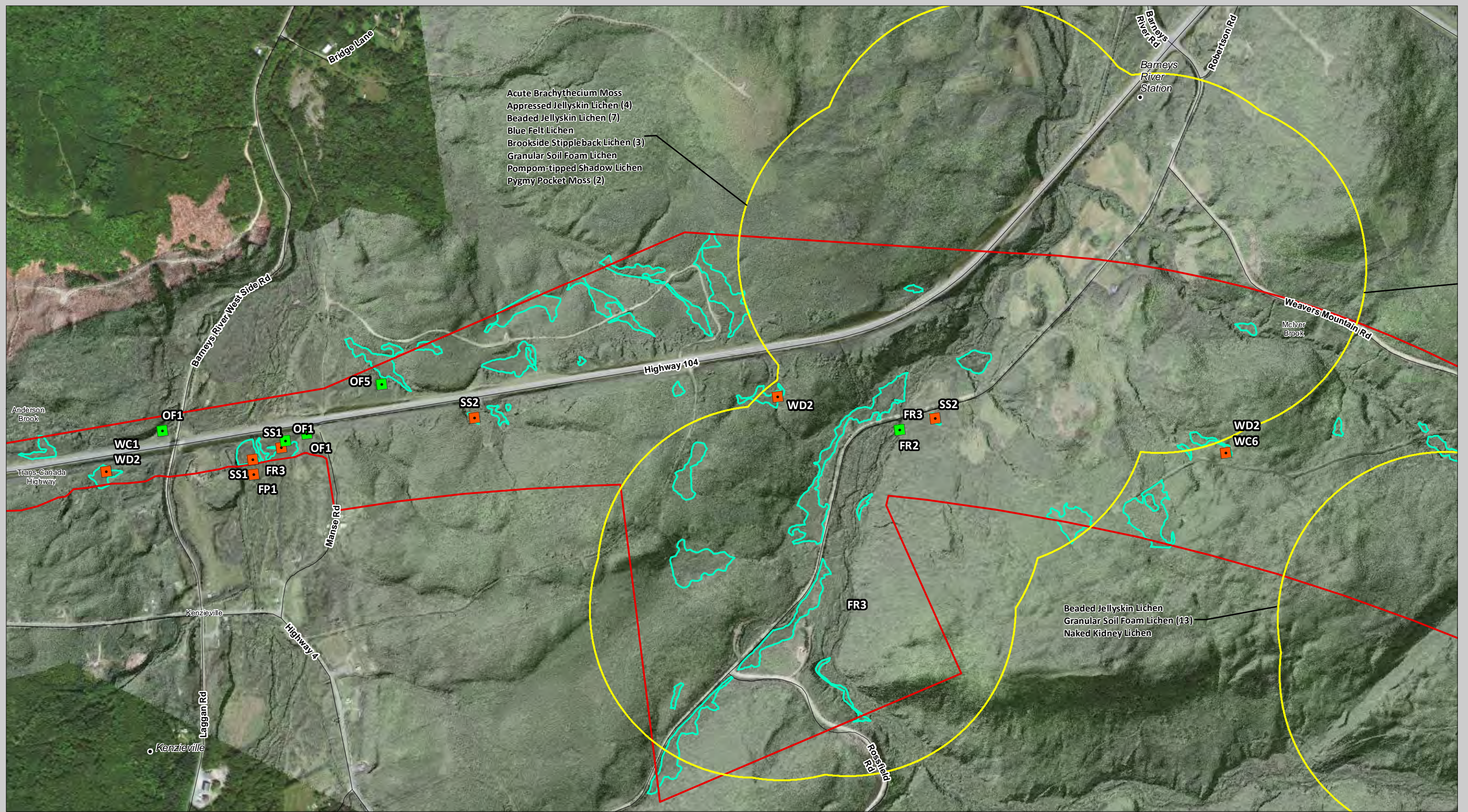
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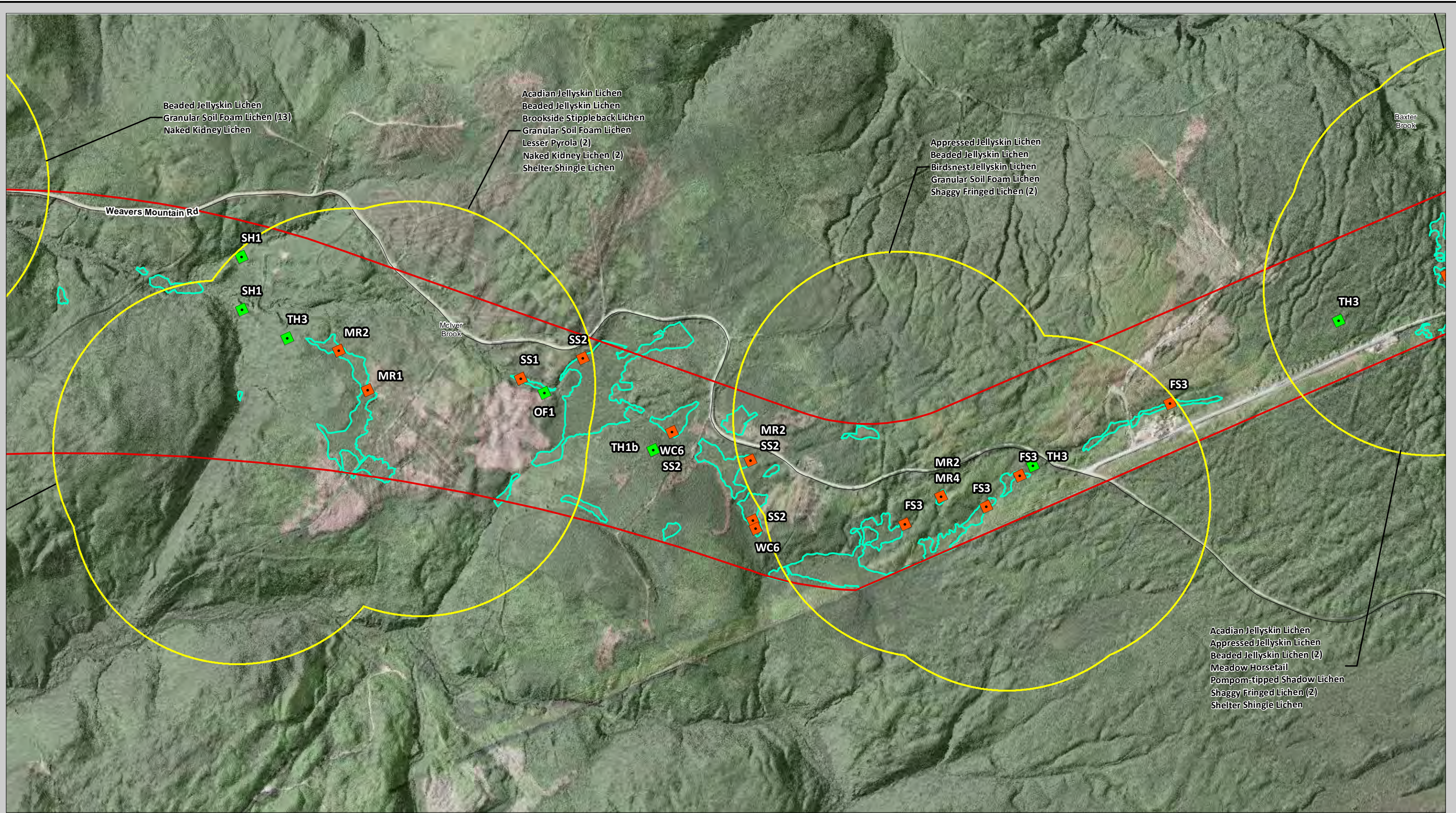
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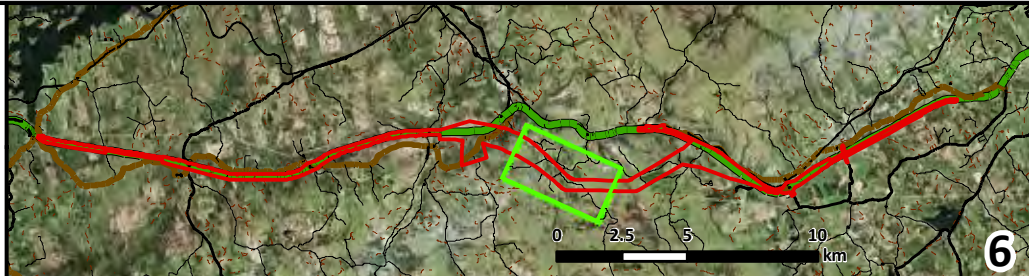
Highway 104
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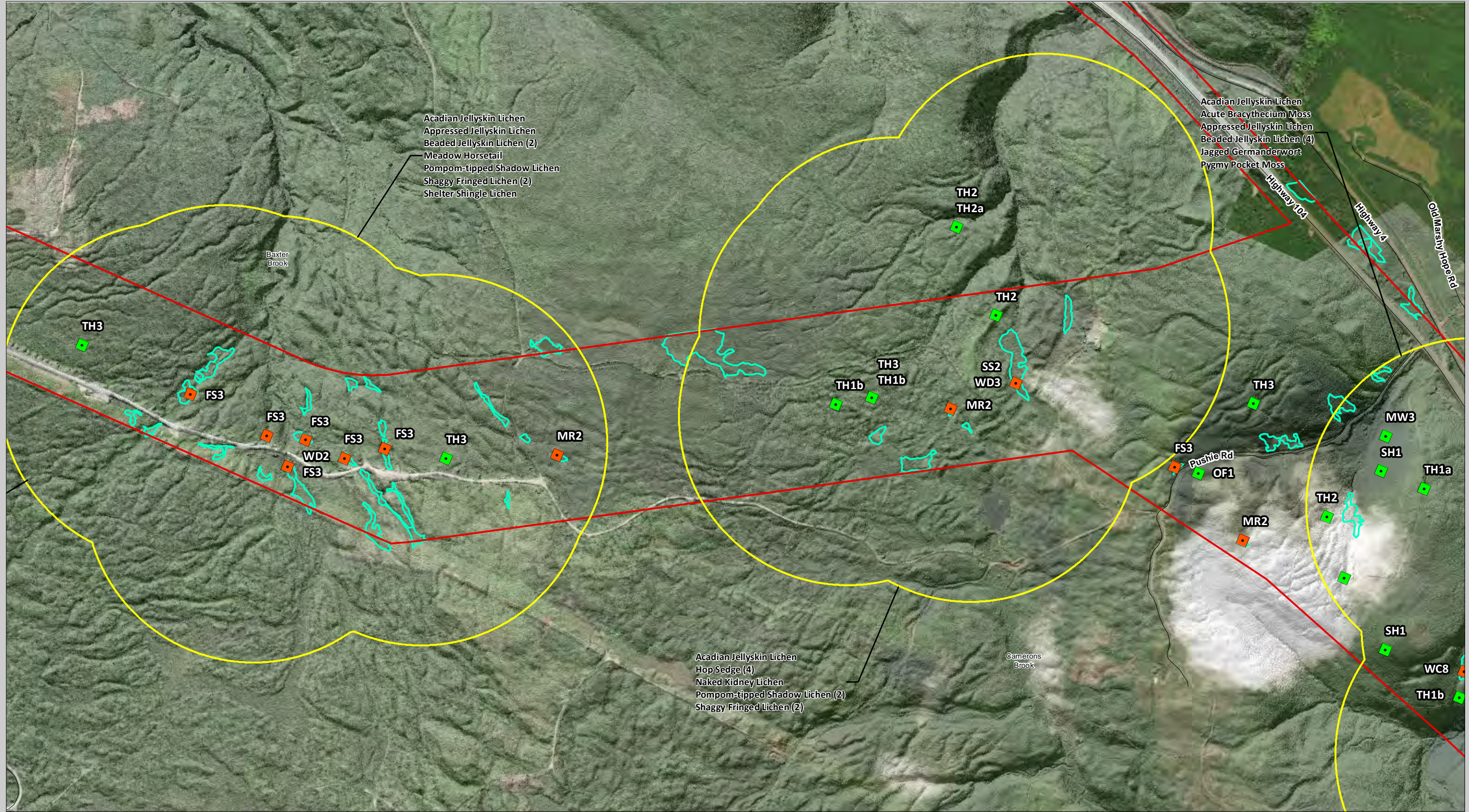
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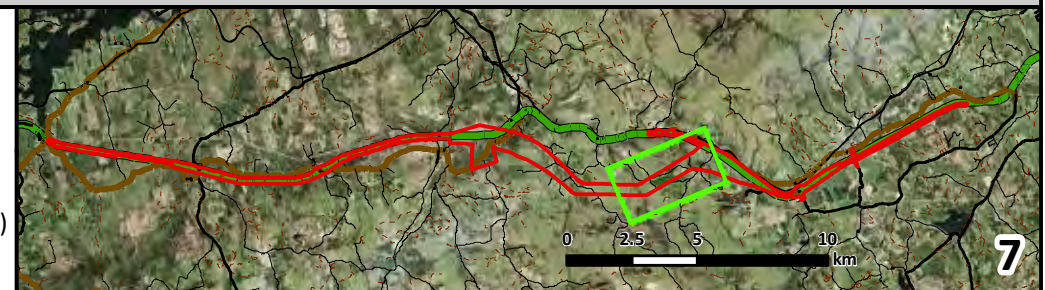


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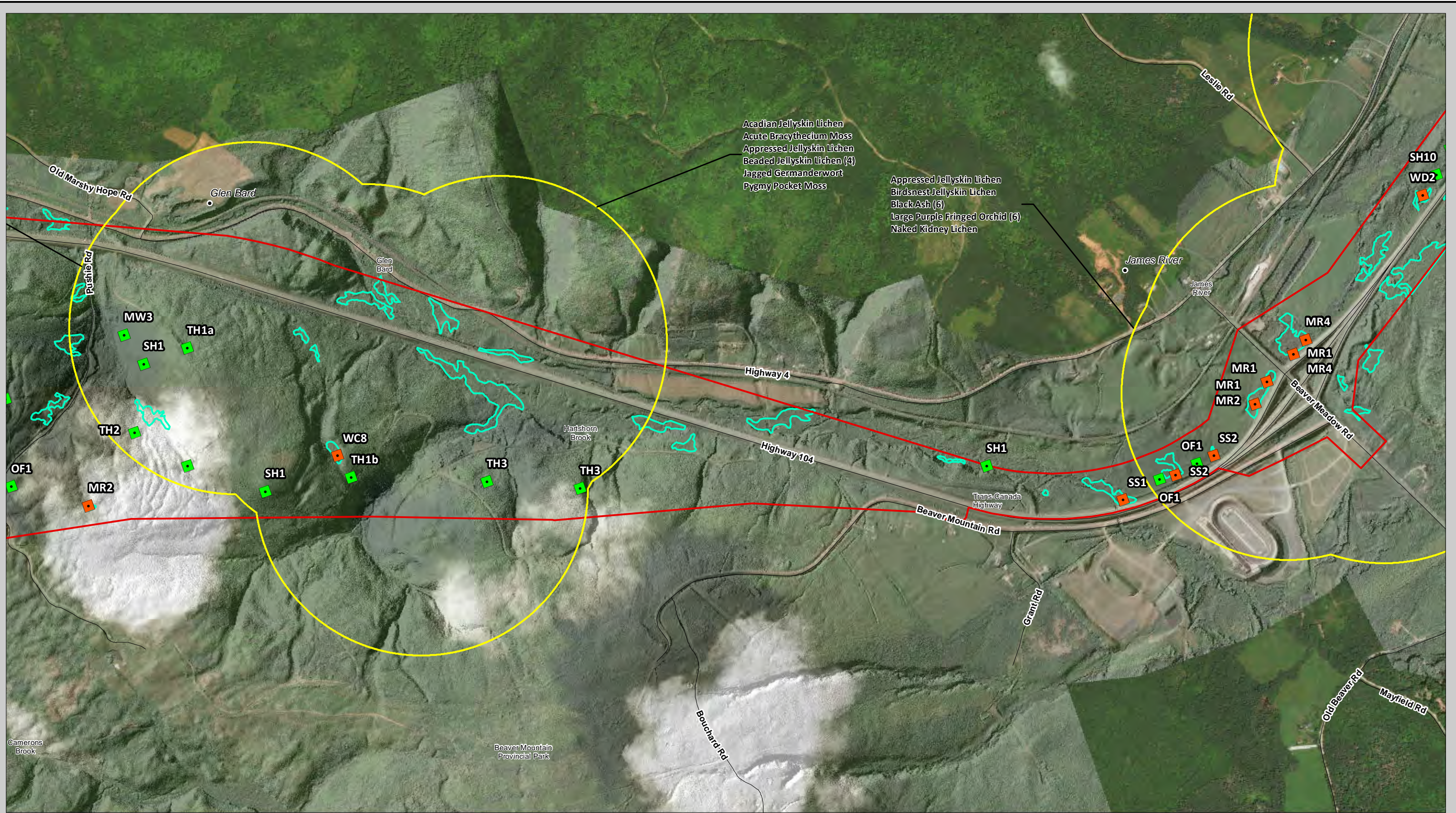


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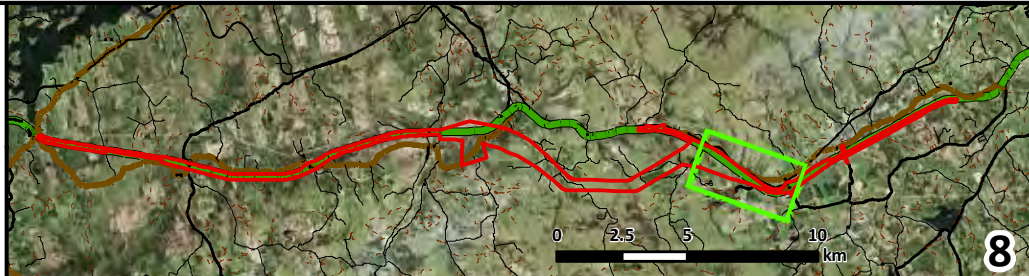
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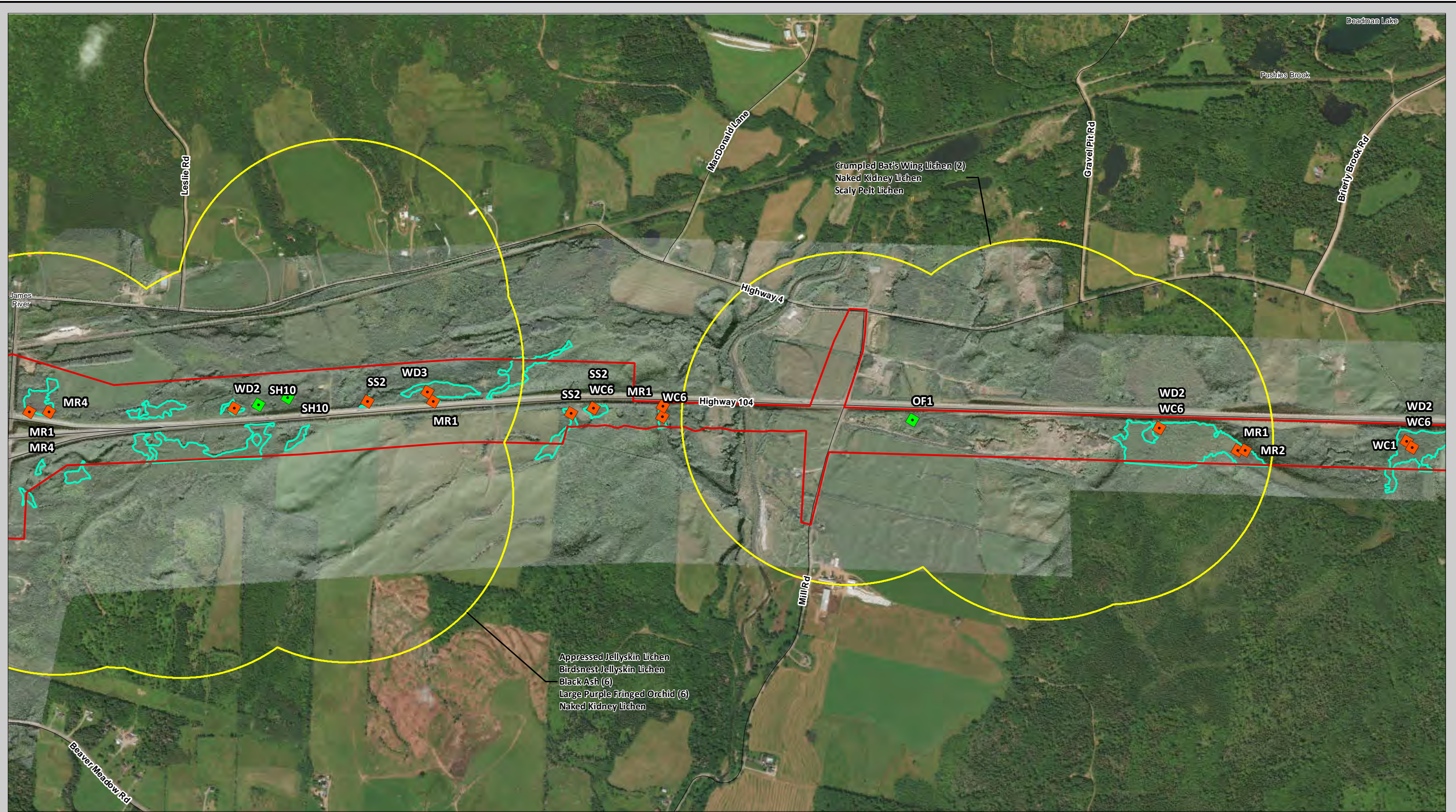


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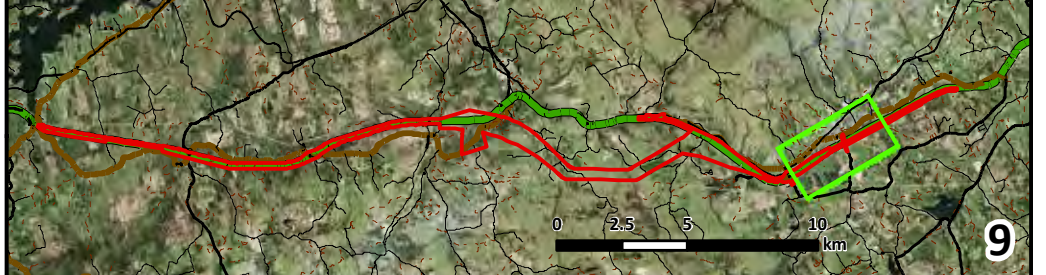
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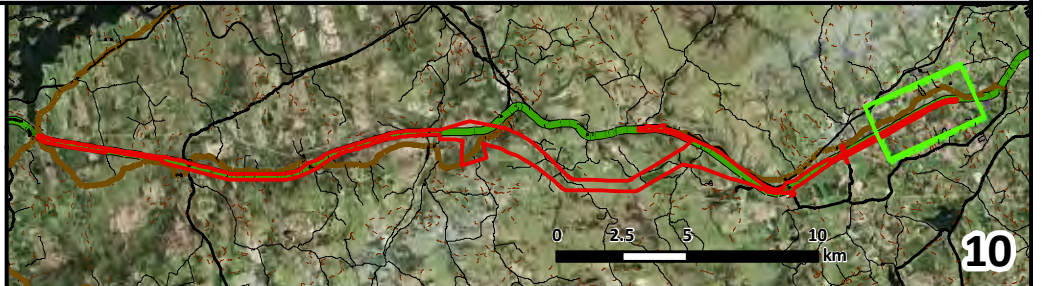
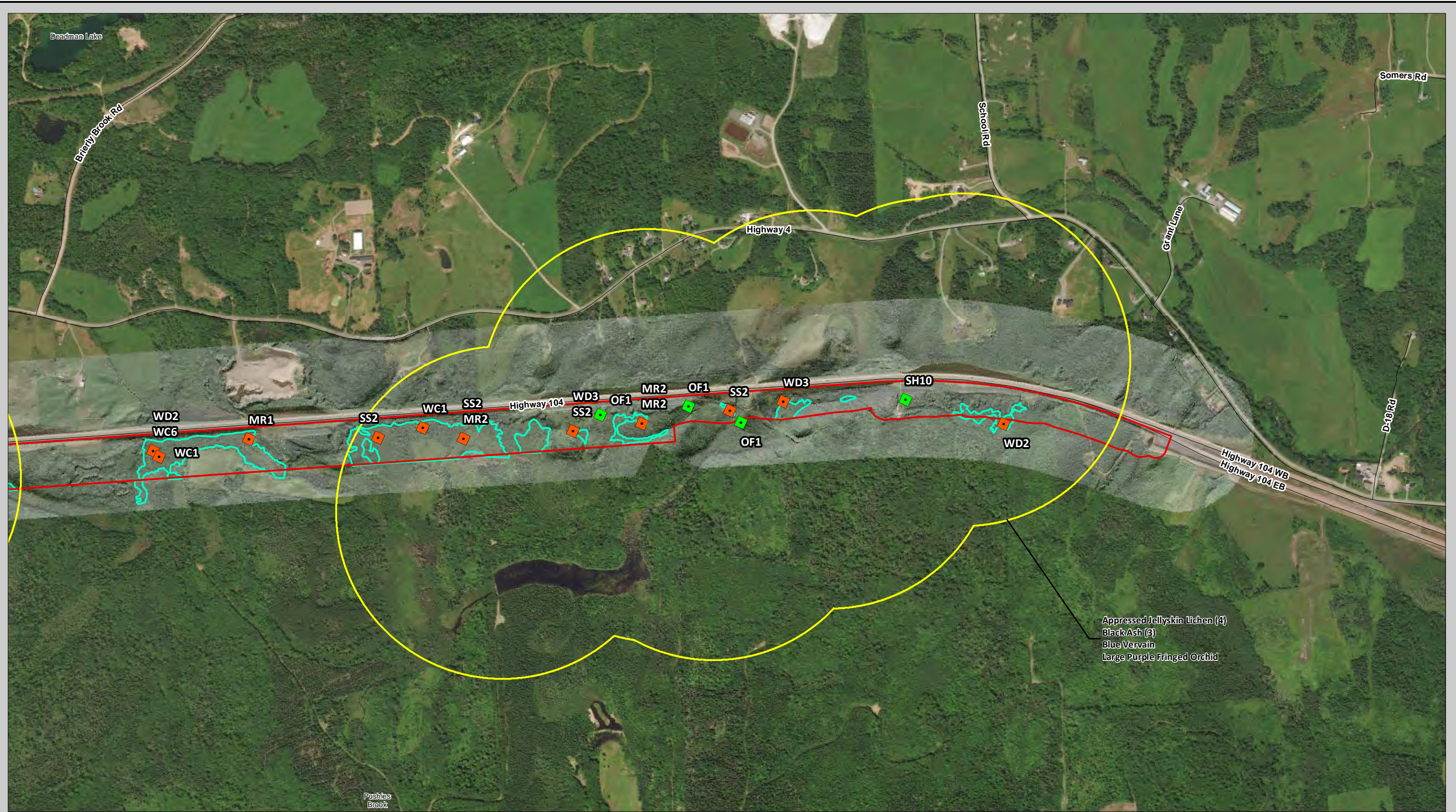
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APPENDIX C

Flora Inventories

Table C-1. Vascular Plants Detected by CBCL within the Highway 104 Twinning Project Study Area in 2018

Family	Scientific Name	Common Name	NS S-RANK
Aceraceae	<i>Acer spicatum</i>	Mountain Maple	S5
	<i>Acer rubrum</i>	Red Maple	S5
	<i>Acer pensylvanicum</i>	Striped Maple	S5
	<i>Acer saccharum</i>	Sugar Maple	S4S5
Alismataceae	<i>Alisma triviale</i>	Northern Water Plantain	S5
Anacardiaceae	<i>Rhus typhina</i>	Staghorn Sumac	S4
Apiaceae	<i>Hydrocotyle americana</i>	American Marsh Pennywort	S5
	<i>Aegopodium podagraria</i>	Bishop's Goutweed	SNA
	<i>Heracleum maximum</i>	Common Cow Parsnip	S5
	<i>Sium suave</i>	Common Water Parsnip	S5
	<i>Osmorhiza claytonii</i>	Hairy Sweet Cicely	S4
	<i>Daucus carota</i>	Queen Anne's Lace	SNA
	<i>Cicuta maculata</i>	Spotted Water-Hemlock	S5
Apocynaceae	<i>Apocynum cannabinum</i>	Indian Hemp	S4
	<i>Apocynum androsaemifolium</i>	Spreading Dogbane	S5
Aquifoliaceae	<i>Ilex verticillata</i>	Common Winterberry	S5
	<i>Nemopanthus mucronatus</i>	Mountain Holly	S5
Araceae	<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S4S5
Araliaceae	<i>Aralia hispida</i>	Bristly Sarsaparilla	S5
	<i>Panax trifolius</i>	Dwarf Ginseng	S4
	<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5
Asteraceae	<i>Oclemena x blakei</i>	a hybrid White Panicked American-Aster	S5
	<i>Erigeron annuus</i>	Annual Fleabane	S4S5
	<i>Centaurea nigra</i>	Black Knapweed	SNA
	<i>Rudbeckia hirta</i>	Black-Eyed Susan	SNA
	<i>Cirsium vulgare</i>	Bull Thistle	SNA
	<i>Symphyotrichum lateriflorum</i>	Calico Aster	S5
	<i>Solidago canadensis</i>	Canada Goldenrod	S4S5
	<i>Tussilago farfara</i>	Coltsfoot	SNA
	<i>Eupatorium perfoliatum</i>	Common Boneset	S5
	<i>Arctium minus</i>	Common Burdock	SNA
	<i>Taraxacum officinale</i>	Common Dandelion	SNA
	<i>Hieracium lachenalii</i>	Common Hawkweed	SNA
	<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5
	<i>Senecio vulgaris</i>	Common Ragwort	SNA
<i>Tanacetum vulgare</i>	Common Tansy	SNA	

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Achillea millefolium</i>	Common Yarrow	S5
	<i>Bidens frondosa</i>	Devil's Beggarticks	S5
	<i>Solidago puberula</i>	Downy Goldenrod	S5
	<i>Leontodon autumnalis</i>	Fall Dandelion	SNA
	<i>Hieracium caespitosum</i>	Field Hawkweed	SNA
	<i>Sonchus arvensis</i>	Field Sow Thistle	SNA
	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5
	<i>Solidago nemoralis</i>	Gray-stemmed Goldenrod	S4S5
	<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	S5
	<i>Antennaria howellii</i>	Howell's Pussytoes	S4
	<i>Helianthus tuberosus</i>	Jerusalem Artichoke	SNA
	<i>Symphyotrichum lanceolatum</i>	Lance-leaved Aster	S4S5
	<i>Eurybia macrophylla</i>	Large-leaved Aster	S5
	<i>Hieracium pilosella</i>	Mouse-ear Hawkweed	SNA
	<i>Symphyotrichum novae-angliae</i>	New England Aster	SNA
	<i>Solidago uliginosa</i>	Northern Bog Goldenrod	S5
	<i>Petasites frigidus</i>	Northern Sweet Coltsfoot	S4
	<i>Leucanthemum vulgare</i>	Oxeye Daisy	SNA
	<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5
	<i>Symphyotrichum puniceum</i>	Purple-stemmed Aster	S5
	<i>Hieracium scabrum</i>	Rough Hawkweed	S5
	<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
	<i>Packera schweinitziana</i>	Schweinitz's Groundsel	S4
	<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	S5
	<i>Solidago simplex</i>	Sticky Goldenrod	SH
	<i>Lactuca biennis</i>	Tall Blue Lettuce	S5
	<i>Hieracium piloselloides</i>	Tall Hawkweed	SNA
	<i>Prenanthes altissima</i>	Tall Rattlesnakeroot	S5
	<i>Prenanthes trifoliolata</i>	Three-leaved Rattlesnakeroot	S5
	<i>Hieracium umbellatum</i>	Umbellate Hawkweed	SNR
	<i>Hieracium murorum</i>	Wall Hawkweed	SNA
	<i>Solidago bicolor</i>	White Goldenrod	S5
	<i>Oclemena acuminata</i>	Whorled Wood Aster	S5
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod	S5
	<i>Senecio jacobaea</i>	Tansy Ragwort	SNA
Balsaminaceae	<i>Impatiens glandulifera</i>	Purple Jewelweed	SNA
	<i>Impatiens capensis</i>	Spotted Jewelweed	S5
Berberidaceae	<i>Berberis vulgaris</i>	Common Barberry	SNA

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Family	Scientific Name	Common Name	NS S-RANK
Betulaceae	<i>Corylus cornuta</i>	Beaked Hazel	S5
	<i>Betula populifolia</i>	Gray Birch	S5
	<i>Betula papyrifera</i> var. <i>cordifolia</i>	Heart-leaved Birch	S5
	<i>Ostrya virginiana</i>	Ironwood	S5
	<i>Betula papyrifera</i>	Paper Birch	S5
	<i>Alnus incana</i>	Speckled Alder	S5
	<i>Betula alleghaniensis</i>	Yellow Birch	S5
Boraginaceae	<i>Symphytum officinale</i>	Common Comfrey	SNA
	<i>Echium vulgare</i>	Common Viper's Bugloss	SNA
	<i>Myosotis arvensis</i>	Field Forget-me-not	SNA
	<i>Myosotis laxa</i>	Small Forget-Me-Not	S5
	<i>Myosotis scorpioides</i>	True Forget-Me-Not	SNA
	<i>Myosotis stricta</i>	Upright Forget-me-not	SNA
	<i>Myosotis sylvatica</i>	Woodland Forget-Me-Not	SNA
Brassicaceae	<i>Hesperis matronalis</i>	Dame's Rocket	SNA
	<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	S5
	<i>Cardamine diphylla</i>	Two-leaved Toothwort	S4
	<i>Rorippa nasturtium-aquaticum</i>	Watercress	SNA
	<i>Barbarea vulgaris</i>	Yellow Rocket	SNA
Caprifoliaceae	<i>Sambucus nigra</i>	Black Elderberry	S5
	<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	S5
	<i>Viburnum lantanoides</i>	Hobblebush	S4S5
	<i>Diervilla lonicera</i>	Northern Bush Honeysuckle	S5
	<i>Viburnum nudum</i> var. <i>cassinoides</i>	Northern Wild Raisin	S5
	<i>Sambucus racemosa</i>	Red Elderberry	S5
	<i>Linnaea borealis</i>	Twinflower	S5
Caryophyllaceae	<i>Cerastium fontanum</i>	Common Chickweed	SNA
	<i>Dianthus armeria</i>	Deptford Pink	SNA
	<i>Silene acaulis</i>	Moss Champion	S1
	<i>Cerastium arvense</i>	Mouse-Ear Chickweed	SU
Chenopodiaceae	<i>Chenopodium album</i>	Common Lamb's Quarters	SNA
Clusiaceae	<i>Hypericum canadense</i>	Canada St John's-wort	S5
	<i>Hypericum perforatum</i>	Common St. John's-wort	SNA
	<i>Triadenum fraseri</i>	Fraser's Marsh St John's-wort	S5
	<i>Hypericum ellipticum</i>	Pale St John's-Wort	S5
	<i>Triadenum virginicum</i>	Virginia St John's-wort	S5
Convolvulaceae	<i>Convolvulus arvensis</i>	Field Bindweed	SNA

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
Cornaceae	<i>Cornus canadensis</i>	Bunchberry	S5
	<i>Cornus sericea</i>	Red Osier Dogwood	S5
	<i>Cornus rugosa</i>	Round-leaved Dogwood	S4
Crassulaceae	<i>Hylotelephium telephium</i>	Garden Stonecrop	SNA
Cyperaceae	<i>Carex brunnescens x canescens</i>	a Hybrid Sedge	
	<i>Carex stipata</i>	Awl-fruited Sedge	S5
	<i>Carex arctata</i>	Black Sedge	S5
	<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	S5
	<i>Carex intumescens</i>	Bladder Sedge	S5
	<i>Carex tribuloides</i>	Blunt Broom Sedge	S3
	<i>Eleocharis obtusa</i>	Blunt Spikerush	S5
	<i>Carex leptalea</i>	Bristly-stalked Sedge	S5
	<i>Carex scoparia</i>	Broom Sedge	S5
	<i>Carex brunnescens</i>	Brownish Sedge	S5
	<i>Eleocharis palustris</i>	Common Spikerush	S5
	<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
	<i>Carex pseudocyperus</i>	Cyperuslike Sedge	S4S5
	<i>Carex tonsa</i>	Deep Green Sedge	S5
	<i>Carex radiata</i>	Eastern Star Sedge	S4
	<i>Carex communis</i>	Fibrous-Root Sedge	S5
	<i>Carex crinita</i>	Fringed Sedge	S5
	<i>Carex gracillima</i>	Graceful Sedge	S4S5
	<i>Carex panicea</i>	Grasslike Sedge	SNA
	<i>Schoenoplectus acutus</i>	Hardstem Bulrush	S4
	<i>Carex lupulina</i>	Hop Sedge	S3
	<i>Carex interior</i>	Inland Sedge	S4S5
	<i>Carex hormathodes</i>	Marsh Straw Sedge	S4S5
	<i>Scirpus hattorianus</i>	Mosquito Bulrush	S5
	<i>Carex projecta</i>	Necklace Sedge	S5
	<i>Eleocharis acicularis</i>	Needle Spikerush	S5
	<i>Carex novae-angliae</i>	New England Sedge	S5
	<i>Carex gynandra</i>	Nodding Sedge	S5
	<i>Carex utriculata</i>	Northern Beaked Sedge	S5
	<i>Carex folliculata</i>	Northern Long Sedge	S5
	<i>Eriophorum tenellum</i>	Rough Cottongrass	S4S5
	<i>Carex scabrata</i>	Rough Sedge	S5
	<i>Carex lurida</i>	Sallow Sedge	S5
<i>Carex canescens</i>	Silvery Sedge	S5	
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5	

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Carex nigra</i>	Smooth Black Sedge	S5
	<i>Carex echinata</i>	Star Sedge	S5
	<i>Carex trisperma</i>	Three-seeded Sedge	S5
	<i>Carex stricta</i>	Tussock Sedge	S5
	<i>Carex torta</i>	Twisted Sedge	S5
	<i>Carex disperma</i>	Two-seeded Sedge	S5
	<i>Carex aquatilis</i>	Water Sedge	S4S5
	<i>Carex debilis</i>	White-edged Sedge	S5
	<i>Carex flava</i>	Yellow Sedge	S5
Dennstaedtiaceae	<i>Pteridium aquilinum</i>	Bracken Fern	S5
	<i>Dennstaedtia punctilobula</i>	Eastern Hay-Scented Fern	S5
Dryopteridaceae	<i>Polystichum braunii</i>	Braun's Holly Fern	S4
	<i>Polystichum acrostichoides</i>	Christmas Fern	S5
	<i>Athyrium filix-femina</i>	Common Lady Fern	S5
	<i>Gymnocarpium dryopteris</i>	Common Oak Fern	S5
	<i>Dryopteris cristata</i>	Crested Wood Fern	S5
	<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5
	<i>Cystopteris fragilis</i>	Fragile Fern	S4
	<i>Dryopteris campyloptera</i>	Mountain Wood Fern	S5
	<i>Phegopteris connectilis</i>	Northern Beech Fern	S5
	<i>Matteuccia struthiopteris</i>	Ostrich Fern	S5
	<i>Onoclea sensibilis</i>	Sensitive Fern	S5
	<i>Deparia acrostichoides</i>	Silvery Glade Fern	S4
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	S5	
Equisetaceae	<i>Equisetum arvense</i>	Field Horsetail	S5
	<i>Equisetum pratense</i>	Meadow Horsetail	S3
	<i>Equisetum fluviatile</i>	Water Horsetail	S5
	<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
Ericaceae	<i>Ledum groenlandicum</i>	Common Labrador Tea	S5
	<i>Gaultheria hispidula</i>	Creeping Snowberry	S5
	<i>Gaultheria procumbens</i>	Eastern Teaberry	S5
	<i>Vaccinium macrocarpon</i>	Large Cranberry	S5
	<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	S5
	<i>Vaccinium vitis-idaea</i>	Mountain Cranberry	S5
	<i>Rhododendron canadense</i>	Rhodora	S5
	<i>Kalmia angustifolia</i>	Sheep Laurel	S5
	<i>Vaccinium oxycoccos</i>	Small Cranberry	S5
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	S5	
Euphorbiaceae	<i>Euphorbia cyparissias</i>	Cypress Spurge	SNA
Fabaceae	<i>Medicago sativa</i>	Alfalfa	SNA

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Apios americana</i>	American Groundnut	S5
	<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	SNA
	<i>Lupinus polyphyllus</i>	Large-Leaved Lupine	SNA
	<i>Trifolium campestre</i>	Low Hop Clover	SNA
	<i>Trifolium arvense</i>	Rabbit's-foot Clover	SNA
	<i>Trifolium pratense</i>	Red Clover	SNA
	<i>Vicia cracca</i>	Tufted Vetch	SNA
	<i>Trifolium repens</i>	White Clover	SNA
	<i>Melilotus albus</i>	White Sweet-clover	SNA
	<i>Melilotus officinalis</i>	Yellow Sweet-clover	SNA
Fagaceae	<i>Fagus grandifolia</i>	American Beech	S5
	<i>Quercus rubra</i>	Northern Red Oak	S5
Fumariaceae	<i>Dicentra cucullaria</i>	Dutchman's Breeches	S4
Geraniaceae	<i>Geranium robertianum</i>	Herb Robert	S4
Grossulariaceae	<i>Ribes lacustre</i>	Bristly Black Currant	S5
	<i>Ribes nigrum</i>	European Black Currant	SNA
	<i>Ribes glandulosum</i>	Skunk Currant	S5
	<i>Ribes hirtellum</i>	Smooth Gooseberry	S5
	<i>Ribes triste</i>	Swamp Red Currant	S4
Iridaceae	<i>Iris versicolor</i>	Harlequin Blue Flag	S5
	<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	S5
Juncaceae	<i>Juncus canadensis</i>	Canada Rush	S5
	<i>Luzula multiflora</i>	Common Woodrush	S5
	<i>Luzula acuminata</i>	Hairy Woodrush	S5
	<i>Juncus articulatus</i>	Jointed Rush	S5
	<i>Juncus nodosus</i>	Knotted Rush	S4
	<i>Juncus tenuis</i>	Slender Rush	S5
	<i>Juncus effusus</i>	Soft Rush	S5
	<i>Juncus filiformis</i>	Thread Rush	S5
	<i>Juncus bufonius</i>	Toad Rush	S5
Lamiaceae	<i>Lycopus americanus</i>	American Water Horehound	S5
	<i>Mentha canadensis</i>	Canadian Mint	S5
	<i>Galeopsis tetrahit</i>	Common Hemp-nettle	SNA
	<i>Prunella vulgaris</i>	Common Self-heal	S5
	<i>Glechoma hederacea</i>	Ground Ivy	SNA
	<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	S5
	<i>Scutellaria galericulata</i>	Marsh Skullcap	S5
	<i>Lycopus uniflorus</i>	Northern Water Horehound	S5
Liliaceae	<i>Streptopus amplexifolius</i>	Clasping-leaved Twisted-stalk	S4S5
	<i>Malus pumila</i>	Common Apple	SNA

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	S4S5
	<i>Medeola virginiana</i>	Indian Cucumber Root	S5
	<i>Maianthemum racemosum</i>	Large False Solomon's Seal	S4S5
	<i>Trillium cernuum</i>	Nodding Trillium	S4
	<i>Trillium undulatum</i>	Painted Trillium	S5
	<i>Trillium erectum</i>	Red Trillium	S4
	<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	S5
	<i>Uvularia sessilifolia</i>	Sessile-leaved Bellwort	S4S5
	<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	S5
	<i>Clintonia borealis</i>	Yellow Bluebead Lily	S5
Lycopodiaceae	<i>Lycopodium obscurum</i>	Flat-branched Tree-clubmoss	S4S5
	<i>Lycopodiella inundata</i>	Northern Bog Clubmoss	S5
	<i>Lycopodium dendroideum</i>	Round-branched Tree-clubmoss	S5
	<i>Lycopodium clavatum</i>	Running Clubmoss	S5
	<i>Lycopodium digitatum</i>	Southern Clubmoss	S5
	<i>Lycopodium annotinum</i>	Stiff Clubmoss	S5
Lythraceae	<i>Lythrum salicaria</i>	Purple Loosestrife	SNA
Monotropaceae	<i>Monotropa uniflora</i>	Indian Pipe	S5
Myricaceae	<i>Morella pensylvanica</i>	Northern Bayberry	S5
Nymphaeaceae	<i>Nuphar lutea ssp. variegata</i>	Variegated Pond-lily	S5
Oleaceae	<i>Fraxinus nigra</i>	Black Ash	S1S2
	<i>Syringa vulgaris</i>	Common Lilac	SNA
	<i>Fraxinus americana</i>	White Ash	S5
Onagraceae	<i>Epilobium leptophyllum</i>	Bog Willowherb	S5
	<i>Oenothera biennis</i>	Common Evening Primrose	S5
	<i>Chamerion angustifolium</i>	Fireweed	S5
	<i>Ludwigia palustris</i>	Marsh Seedbox	S5
	<i>Epilobium ciliatum</i>	Northern Willowherb	S5
	<i>Oenothera perennis</i>	Perennial Evening Primrose	S5
	<i>Circaea alpina</i>	Small Enchanter's Nightshade	S5
Orchidaceae	<i>Platanthera clavellata</i>	Club Spur Orchid	S5
	<i>Corallorhiza trifida</i>	Early Coralroot	S4
	<i>Epipactis helleborine</i>	Helleborine	SNA
	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid	S3
	<i>Cypripedium acaule</i>	Pink Lady's-Slipper	S5
	<i>Pogonia ophioglossoides</i>	Rose Pogonia	S4
	<i>Spiranthes lacera</i>	Slender Ladies'-tresses	S5
	<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	S4
Osmundaceae	<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5
	<i>Osmunda claytoniana</i>	Interrupted Fern	S5

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Osmunda regalis</i>	Royal Fern	S5
	<i>Osmunda regalis var. spectabilis</i>	Royal Fern	S5
Oxalidaceae	<i>Oxalis montana</i>	Common Wood Sorrel	S5
	<i>Oxalis stricta</i>	European Wood Sorrel	S5
Pinaceae	<i>Abies balsamea</i>	Balsam Fir	S5
	<i>Picea mariana</i>	Black Spruce	S5
	<i>Tsuga canadensis</i>	Eastern Hemlock	S4S5
	<i>Pinus strobus</i>	Eastern White Pine	S5
	<i>Pinus banksiana</i>	Jack Pine	S4
	<i>Picea abies</i>	Norway Spruce	SNA
	<i>Pinus resinosa</i>	Red Pine	S4S5
	<i>Picea rubens</i>	Red Spruce	S5
	<i>Pinus sylvestris</i>	Scotch Pine	SNA
	<i>Larix laricina</i>	Tamarack	S5
	<i>Picea glauca</i>	White Spruce	S5
Plantaginaceae	<i>Plantago major</i>	Common Plantain	SNA
Poaceae	<i>Glyceria obtusa</i>	Atlantic Manna Grass	S4
	<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5
	<i>Poa compressa</i>	Canada Blue Grass	SNA
	<i>Glyceria canadensis</i>	Canada Manna Grass	S5
	<i>Agrostis capillaris</i>	Colonial Bent Grass	SNA
	<i>Glyceria grandis</i>	Common Tall Manna Grass	S4S5
	<i>Phleum pratense</i>	Common Timothy	SNA
	<i>Agrostis stolonifera</i>	Creeping Bent Grass	S5
	<i>Cinna latifolia</i>	Drooping Wood Reed Grass	S5
	<i>Glyceria striata</i>	Fowl Manna Grass	S5
	<i>Festuca filiformis</i>	Hair Fescue	SNA
	<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	SNA
	<i>Gnaphalium uliginosum</i>	Marsh Cudweed	SNA
	<i>Glyceria borealis</i>	Northern Manna Grass	S5
	<i>Glyceria laxa</i>	Northern Mannagrass	S4?
	<i>Brachyelytrum septentrionale</i>	Northern Shorthusk	S5
	<i>Calamagrostis pickeringii</i>	Pickering's Reed Grass	S4S5
	<i>Danthonia spicata</i>	Poverty Oat Grass	S5
	<i>Elymus repens</i>	Quack Grass	SNA
	<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Leersia oryzoides</i>	Rice Cut Grass	S5	
<i>Spartina patens</i>	Saltmeadow Cord Grass	S5	

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Glyceria melicaria</i>	Slender Manna Grass	S4
	<i>Dichanthelium acuminatum</i>	Woolly Panic Grass	S5
Polygonaceae	<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5
	<i>Rumex crispus</i>	Curled Dock	SNA
	<i>Rumex acetosa</i>	Garden Sorrel	SNA
	<i>Rumex orbiculatus</i>	Greater Water Dock	S5
	<i>Polygonum cuspidatum</i>	Japanese Knotweed	SNA
	<i>Polygonum hydropiper</i>	Marshpepper Smartweed	SNA
	<i>Rumex acetosella</i>	Sheep Sorrel	SNA
	<i>Polygonum persicaria</i>	Spotted Lady's-thumb	SNA
Polypodiaceae	<i>Polypodium virginianum</i>	Rock Polypody	S5
Portulacaceae	<i>Claytonia caroliniana</i>	Carolina Spring Beauty	S4
Potamogetonaceae	<i>Potamogeton foliosus</i>	Leafy Pondweed	S4S5
Primulaceae	<i>Lysimachia nummularia</i>	Creeping Yellow Loosestrife	SNA
	<i>Trientalis borealis</i>	Northern Starflower	S5
	<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5
Pyrolaceae	<i>Pyrola minor</i>	Lesser Pyrola	S3
	<i>Pyrola elliptica</i>	Shinleaf	S5
Ranunculaceae	<i>Ranunculus acris</i>	Common Buttercup	SNA
	<i>Ranunculus repens</i>	Creeping Buttercup	SNA
	<i>Aquilegia vulgaris</i>	European Columbine	SNA
	<i>Coptis trifolia</i>	Goldthread	S5
	<i>Ranunculus recurvatus</i>	Hooked Buttercup	S4
	<i>Ranunculus abortivus</i>	Kidney-Leaved Buttercup	S4S5
	<i>Actaea rubra</i>	Red Baneberry	S5
	<i>Thalictrum pubescens</i>	Tall Meadow-Rue	S5
	<i>Clematis virginiana</i>	Virginia Clematis	S5
<i>Actaea pachypoda</i>	White Baneberry	S4	
Rosaceae	<i>Rubus allegheniensis</i>	Alleghaney Blackberry	S5
	<i>Sorbus americana</i>	American Mountain Ash	S5
	<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	S5
	<i>Prunus serotina</i>	Black Cherry	S5
	<i>Rubus hispidus</i>	Bristly Dewberry	S5
	<i>Amelanchier canadensis</i>	Canada Serviceberry	S4S5
	<i>Prunus virginiana</i>	Chokecherry	S5
	<i>Amelanchier arborea</i>	Downy Serviceberry	S4S5
	<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
	<i>Agrimonia eupatoria</i>	European Agrimony	SNA
	<i>Geum macrophyllum</i>	Large-Leaved Avens	S5
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5	

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
	<i>Prunus pensylvanica</i>	Pin Cherry	S5
	<i>Rubus idaeus</i>	Red Raspberry	S5
	<i>Geum laciniatum</i>	Rough Avens	S5
	<i>Potentilla norvegica</i>	Rough Cinquefoil	S5
	<i>Potentilla argentea</i>	Silvery Cinquefoil	SNA
	<i>Spiraea tomentosa</i>	Steeplebush	S5
	<i>Rosa virginiana</i>	Virginia Rose	S5
	<i>Geum rivale</i>	Water Avens	S5
	<i>Geum canadense</i>	White Avens	S4S5
	<i>Spiraea alba var. latifolia</i>	White Meadowsweet	S5
	<i>Fragaria virginiana</i>	Wild Strawberry	S5
	<i>Agrimonia striata</i>	Woodland Agrimony	S5
	<i>Geum aleppicum</i>	Yellow Avens	S5
Rubiaceae	<i>Galium palustre</i>	Common Marsh Bedstraw	S5
	<i>Mitchella repens</i>	Partridgeberry	S5
	<i>Galium asprellum</i>	Rough Bedstraw	S5
	<i>Galium mollugo</i>	Smooth Bedstraw	SNA
Salicaceae	<i>Populus balsamifera</i>	Balsam Poplar	S4
	<i>Salix bebbiana</i>	Bebb's Willow	S5
	<i>Salix eriocephala</i>	Cottony Willow	S5
	<i>Populus grandidentata</i>	Large-toothed Aspen	S5
	<i>Salix discolor</i>	Pussy Willow	S5
	<i>Salix lucida</i>	Shining Willow	S5
	<i>Populus tremuloides</i>	Trembling Aspen	S5
	<i>Salix alba</i>	White Willow	SNA
Saxifragaceae	<i>Chrysosplenium americanum</i>	American Golden Saxifrage	S5
	<i>Mitella nuda</i>	Naked Bishop's-Cap	S4S5
Scrophulariaceae	<i>Melampyrum lineare</i>	American Cow Wheat	S5
	<i>Euphrasia nemorosa</i>	Common Eyebright	S5
	<i>Verbascum thapsus</i>	Common Mullein	SNA
	<i>Veronica officinalis</i>	Common Speedwell	S5
	<i>Rhinanthus minor</i>	Little Yellow Rattle	SNA
	<i>Chelone glabra</i>	White Turtlehead	S5
Solanaceae	<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
Sparganiaceae	<i>Sparganium americanum</i>	American Burreed	S5
Taxaceae	<i>Taxus canadensis</i>	Canada Yew	S4S5
Thelypteridaceae	<i>Thelypteris simulata</i>	Bog Fern	S4
	<i>Thelypteris palustris</i>	Eastern Marsh Fern	S5
	<i>Thelypteris noveboracensis</i>	New York Fern	S5

Appendix C – Flora Species Inventories – Table C-1

Family	Scientific Name	Common Name	NS S-RANK
Typhaceae	<i>Typha latifolia</i>	Broad-leaved Cattail	S5
	<i>Typha angustifolia</i>	Narrow-Leaved Cattail	S5
Ulmaceae	<i>Ulmus americana</i>	White Elm	S4
Urticaceae	<i>Urtica dioica</i>	Stinging Nettle	S4
Violaceae	<i>Viola cucullata</i>	Marsh Blue Violet	S5
	<i>Viola macloskeyi</i>	Small White Violet	S5
	<i>Viola blanda</i>	Sweet White Violet	S5

Table C-2. Vascular Plant Species Detected by CBCL within the Highway 104 Twinning Project Study Area in 2016

Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
Aceraceae	<i>Acer pensylvanicum</i>	Striped Maple	G5	N5	S5
	<i>Acer rubrum</i>	Red Maple	G5	NNR	S5
	<i>Acer saccharum</i>	Sugar Maple	G5	N5	S5
	<i>Acer spicatum</i>	Mountain Maple	G5	NNR	S5
Alismataceae	<i>Alisma triviale</i>	Northern Water Plantain	G5	NNR	S5
Anacardiaceae	<i>Rhus typhina</i>	Staghorn Sumac	G5	NNR	S4S5
	<i>Toxicodendron radicans</i>	Poison Ivy	G5	N5	S4
Apiaceae	<i>Aegopodium podagraria</i>	Bishop's Goutweed	GNR	NNA	SNA
	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	G5	NNR	S3
	<i>Cicuta maculata</i>	Spotted Water-Hemlock	G5	NNR	S5
	<i>Daucus carota</i>	Queen Anne's Lace	GNR	NNA	SNA
	<i>Heracleum maximum</i>	Common Cow Parsnip	G5	NNR	S5
	<i>Hydrocotyle americana</i>	American Marsh Pennywort	G5	NNR	S5
	<i>Osmorhiza claytonii</i>	Hairy Sweet Cicely	G5	NNR	S4
	<i>Pastinaca sativa</i>	Wild Parsnip	GNR	NNA	SNA
	<i>Sium suave</i>	Common Water Parsnip	G5	N5	S5
Apocynaceae	<i>Apocynum androsaemifolium</i>	Spreading Dogbane	G5	NNR	S5
	<i>Apocynum cannabinum</i>	Indian Hemp	G5	NNR	S4
	<i>Vinca minor</i>	Lesser Periwinkle	GNR	NNA	SNA
Aquifoliaceae	<i>Ilex glabra</i>	Inkberry	G5	NNR	S5
	<i>Ilex verticillata</i>	Common Winterberry	G5	NNR	S5
	<i>Nemopanthus mucronatus</i>	Mountain Holly	G5	NNR	S5
Araceae	<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	G5	NNR	S4S5
Araliaceae	<i>Aralia hispida</i>	Bristly Sarsaparilla	G5	NNR	S5
	<i>Aralia nudicaulis</i>	Wild Sarsaparilla	G5	N5	S5
	<i>Panax trifolius</i>	Dwarf Ginseng	G5	N4N5	S4
Asteraceae	<i>Achillea millefolium</i>	Common Yarrow	G5	N5	S5
	<i>Ambrosia artemisiifolia</i>	Common Ragweed	G5	N5	S5
	<i>Anaphalis margaritacea</i>	Pearly Everlasting	G5	N3N5	S5
	<i>Antennaria neglecta</i>	Field Pussytoes	G5	NNR	SNR
	<i>Arctium minus</i>	Common Burdock	GNR	NNA	SNA
	<i>Bidens cernua</i>	Nodding Beggarticks	G5	NNR	S5
	<i>Bidens frondosa</i>	Devil's Beggarticks	G5	N5	S5
	<i>Centaurea nigra</i>	Black Knapweed	GNR	NNA	SNA
	<i>Cichorium intybus</i>	Wild Chicory	GNR	NNA	SNA
	<i>Cirsium vulgare</i>	Bull Thistle	GNR	NNA	SNA

Appendix C – Flora Species Inventories – Table C-2

Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	G5	NNR	S5
	<i>Erechtites hieraciifolia</i>	Eastern Burnweed	G5	NNR	S5
	<i>Erigeron annuus</i>	Annual Fleabane	G5	N5	S4S5
	<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	G5	N5	S5
	<i>Eupatorium perfoliatum</i>	Common Boneset	G5	N5	S5
	<i>Eurybia macrophylla</i>	Large-leaved Aster	G5	NNR	S5
	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	G5	NNR	S5
	<i>Gnaphalium uliginosum</i>	Marsh Cudweed	G5	NNR	SNA
	<i>Hieracium aurantiacum</i>	Orange Hawkweed	GNR	NNA	SNA
	<i>Hieracium piloselloides</i>	Tall Hawkweed	GNR	NNA	SNA
	<i>Hieracium scabrum</i>	Rough Hawkweed	G5	NNR	S5
	<i>Inula helenium</i>	Elecampane	GNR	NNA	SNA
	<i>Lactuca biennis</i>	Tall Blue Lettuce	G5	NNR	S5
	<i>Lactuca serriola</i>	Prickly Lettuce	GNR	NNA	SNA
	<i>Leontodon autumnalis</i>	Fall Dandelion	GNR	NNA	SNA
	<i>Leucanthemum vulgare</i>	Oxeye Daisy	GNR	NNA	SNA
	<i>Matricaria discoidea</i>	Pineapple Weed	G5	NNR	SNA
	<i>Oclemena acuminata</i>	Whorled Wood Aster	G5	NNR	S5
	<i>Prenanthes altissima</i>	Tall Rattlesnakeroot	G5?	NNR	S5
	<i>Prenanthes trifoliolata</i>	Three-leaved Rattlesnakeroot	G5	NNR	S5
	<i>Rudbeckia hirta</i>	Black-Eyed Susan	G5	N5	SNA
	<i>Senecio jacobaea</i>	Tansy Ragwort	GNR	NNA	SNA
	<i>Solidago bicolor</i>	White Goldenrod	G5	NNR	S5
	<i>Solidago canadensis</i>	Canada Goldenrod	G5	N5	S5
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod	G5	NNR	S5
	<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	G5	N5	S5
	<i>Symphotrichum lanceolatum</i> var. <i>hirsuticaule</i>	Panicled Aster	G5TNR	NNR	SNA
	<i>Tanacetum vulgare</i>	Common Tansy	GNR	NNA	SNA
	<i>Taraxacum officinale</i>	Common Dandelion	G5	N5	SNA
	<i>Tragopogon pratensis</i>	Meadow Goatsbeard	GNR	NNA	SNA
	<i>Tussilago farfara</i>	Coltsfoot	GNR	NNA	SNA
Balsaminaceae	<i>Impatiens capensis</i>	Spotted Jewelweed	G5	N5	S5
Berberidaceae	<i>Berberis vulgaris</i>	Common Barberry	GNR	NNA	SNA
Betulaceae	<i>Alnus incana</i>	Speckled Alder	G5	NNR	S5
	<i>Betula alleghaniensis</i>	Yellow Birch	G5	NNR	S5
	<i>Betula papyrifera</i>	Paper Birch	G5	N5	S5

Appendix C – Flora Species Inventories – Table C-2

Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Betula populifolia</i>	Gray Birch	G5	NNR	S5
	<i>Corylus cornuta</i>	Beaked Hazel	G5	NNR	S5
	<i>Ostrya virginiana</i>	Ironwood	G5	NNR	S5
Boraginaceae	<i>Echium vulgare</i>	Common Viper's Bugloss	GNR	NNA	SNA
	<i>Myosotis arvensis</i>	Field Forget-me-not	GNR	NNA	SNA
	<i>Symphytum officinale</i>	Common Comfrey	GNR	NNA	SNA
Brassicaceae	<i>Barbarea vulgaris</i>	Yellow Rocket	GNR	NNA	SNA
	<i>Cardamine diphylla</i>	Two-leaved Toothwort	G5	NNR	S4
	<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	G5	NNR	S5
	<i>Hesperis matronalis</i>	Dame's Rocket	G4G5	NNA	SNA
	<i>Rorippa sylvestris</i>	Creeping Yellowcress	G5	NNA	SNA
Campanulaceae	<i>Lobelia inflata</i>	Indian Tobacco	G5	N5	S5
Caprifoliaceae	<i>Linnaea borealis</i>	Twinflower	G5	NNR	S5
	<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	G5	NNR	S5
	<i>Lonicera periclymenum</i>	European Honeysuckle	GNR	NNA	SNA
	<i>Sambucus racemosa</i>	Red Elderberry	G5	N5	S5
	<i>Viburnum lantanoides</i>	Hobblebush	G5	NNR	S5
	<i>Viburnum nudum</i>	Northern Wild Raisin	G5	NNR	S5
	<i>Viburnum opulus</i>	Highbush Cranberry	G5	N5	S4
Caryophyllaceae	<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort	GNR	NNA	SNA
	<i>Cerastium arvense</i>	Mouse-Ear Chickweed	G5	N5	SNR
	<i>Dianthus armeria</i>	Deptford Pink	GNR	NNA	SNA
	<i>Silene vulgaris</i>	Bladder Campion	GNR	NNA	SNA
	<i>Stellaria graminea</i>	Little Starwort	GNR	NNA	SNA
Chenopodiaceae	<i>Atriplex patula</i>	Spreading Orache	G5	NNR	SNA
	<i>Chenopodium album</i>	Common Lamb's Quarters	G5	N1N3	SNA
Clusiaceae	<i>Hypericum canadense</i>	Canada St John's-wort	G5	NNR	S5
	<i>Hypericum perforatum</i>	Common St. John's-wort	GNR	NNA	SNA
Convolvulaceae	<i>Calystegia sepium</i>	Hedge False Bindweed	G5	N5	S5
Cornaceae	<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	G5	NNR	S5
	<i>Cornus canadensis</i>	Bunchberry	G5	N5	S5
	<i>Cornus sericea</i>	Red Osier Dogwood	G5	NNR	S5
Crassulaceae	<i>Hylotelephium telephium</i>	Garden Stonecrop	GNR	NNA	SNA
Cupressaceae	<i>Juniperus communis</i>	Common Juniper	G5	N5	S5
Cyperaceae	<i>Carex arctata</i>	Black Sedge	G5	N5	S5
	<i>Carex canescens</i>	Silvery Sedge	G5	NNR	S5
	<i>Carex crinita</i>	Fringed Sedge	G5	NNR	S5
	<i>Carex deweyana</i>	Dewey's Sedge	G5	N5	S5
	<i>Carex disperma</i>	Two-seeded Sedge	G5	NNR	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Carex echinata</i>	Star Sedge	G5	NNR	S5
	<i>Carex flava</i>	Yellow Sedge	G5	NNR	S5
	<i>Carex folliculata</i>	Northern Long Sedge	G4G5	NNR	S5
	<i>Carex gracillima</i>	Graceful Sedge	G5	NNR	S4S5
	<i>Carex gynandra</i>	Nodding Sedge	G5	NNR	S5
	<i>Carex intumescens</i>	Bladder Sedge	G5	NNR	S5
	<i>Carex lasiocarpa</i>	Slender Sedge	G5	NNR	S5
	<i>Carex lurida</i>	Sallow Sedge	G5	NNR	S5
	<i>Carex nigra</i>	Smooth Black Sedge	G5	N5	S5
	<i>Carex projecta</i>	Necklace Sedge	G5	NNR	S5
	<i>Carex pseudocyperus</i>	Cyperuslike Sedge	G5	NNR	S4S5
	<i>Carex scabrata</i>	Rough Sedge	G5	NNR	S5
	<i>Carex silicea</i>	Seabeach Sedge	G5	NNR	S4S5
	<i>Carex stipata</i>	Awl-fruited Sedge	G5	NNR	S5
	<i>Carex stricta</i>	Tussock Sedge	G5	NNR	S5
	<i>Carex torta</i>	Twisted Sedge	G5	NNR	S5
	<i>Carex trisperma</i>	Three-seeded Sedge	G5	NNR	S5
	<i>Carex utriculata</i>	Northern Beaked Sedge	G5	NNR	S5
	<i>Dulichium arundinaceum</i>	Three-Way Sedge	G5	NNR	S5
	<i>Eleocharis acicularis</i>	Needle Spikerush	G5	NNR	S5
	<i>Eleocharis obtusa</i>	Blunt Spikerush	G5	NNR	S5
	<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush	G5	N5	S5
	<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	G5	NNR	S5
	<i>Scirpus atrovirens</i>	Dark-green Bulrush	G5?	NNR	SNA
	<i>Scirpus cyperinus</i>	Common Woolly Bulrush	G5	NNR	S5
	<i>Scirpus microcarpus</i>	Small-fruited Bulrush	G5	NNR	S5
Dennstaedtiaceae	<i>Dennstaedtia punctilobula</i>	Eastern Hay-Scented Fern	G5	NNR	S5
	<i>Pteridium aquilinum</i>	Bracken Fern	G5	N5	S5
Dryopteridaceae	<i>Athyrium filix-femina</i>	Common Lady Fern	G5	NNR	S5
	<i>Deparia acrostichoides</i>	Silvery Glade Fern	G5	NNR	S4
	<i>Dryopteris campyloptera</i>	Mountain Wood Fern	G5	NNR	S5
	<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	G5	NNR	S5
	<i>Dryopteris cristata</i>	Crested Wood Fern	G5	NNR	S5
	<i>Dryopteris intermedia</i>	Evergreen Wood Fern	G5	NNR	S5
	<i>Gymnocarpium dryopteris</i>	Common Oak Fern	G5	N5	S5
	<i>Matteuccia struthiopteris</i>	Ostrich Fern	G5	N5	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Onoclea sensibilis</i>	Sensitive Fern	G5	NNR	S5
	<i>Polystichum acrostichoides</i>	Christmas Fern	G5	NNR	S5
Equisetaceae	<i>Equisetum arvense</i>	Field Horsetail	G5	NNR	S5
	<i>Equisetum sylvaticum</i>	Woodland Horsetail	G5	NNR	S5
Ericaceae	<i>Chamaedaphne calyculata</i>	Leatherleaf	G5	N5	S5
	<i>Gaultheria procumbens</i>	Eastern Teaberry	G5	N5	S5
	<i>Kalmia angustifolia</i>	Sheep Laurel	G5	NNR	S5
	<i>Kalmia polifolia</i>	Pale Bog Laurel	G5	NNR	S5
	<i>Ledum groenlandicum</i>	Common Labrador Tea	G5	N5	S5
	<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	G5	N5	S5
	<i>Vaccinium macrocarpon</i>	Large Cranberry	G4	N4?	S5
	<i>Vaccinium oxycoccos</i>	Small Cranberry	G5	N5	S5
Fabaceae	<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	GNR	NNA	SNA
	<i>Lupinus polyphyllus</i>	Large-Leaved Lupine	G5	N4	SNA
	<i>Medicago lupulina</i>	Black Medick	GNR	NNA	SNA
	<i>Medicago sativa</i>	Alfalfa	GNR	NNA	SNA
	<i>Melilotus albus</i>	White Sweet-clover	G5	NNA	SNA
	<i>Melilotus altissimus</i>	Tall Yellow Sweet-clover	GNR	NNA	SNA
	<i>Robinia pseudoacacia</i>	Black Locust	G5	NNA	SNA
	<i>Trifolium arvense</i>	Rabbit's-foot Clover	GNR	NNA	SNA
	<i>Trifolium campestre</i>	Low Hop Clover	GNR	NNA	SNA
	<i>Trifolium hybridum</i>	Alsike Clover	GNR	NNA	SNA
	<i>Trifolium pratense</i>	Red Clover	GNR	NNA	SNA
	<i>Vicia cracca</i>	Tufted Vetch	GNR	NNA	SNA
Fagaceae	<i>Fagus grandifolia</i>	American Beech	G5	NNR	S5
Fumariaceae	<i>Dicentra cucullaria</i>	Dutchman's Breeches	G5	NNR	S4
Geraniaceae	<i>Geranium robertianum</i>	Herb Robert	G5	N4	S4
Grossulariaceae	<i>Ribes glandulosum</i>	Skunk Currant	G5	N5	S5
	<i>Ribes hirtellum</i>	Smooth Gooseberry	G5	NNR	S5
	<i>Ribes lacustre</i>	Bristly Black Currant	G5	NNR	S5
Iridaceae	<i>Iris versicolor</i>	Harlequin Blue Flag	G5	N5	S5
	<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	G5	N5	S5
Juncaceae	<i>Juncus articulatus</i>	Jointed Rush	G5	NNR	S5
	<i>Juncus balticus</i>	Baltic Rush	G5	NNR	S5
	<i>Juncus bufonius</i>	Toad Rush	G5	NNR	S5
	<i>Juncus canadensis</i>	Canada Rush	G5	N5	S5
	<i>Juncus effusus</i>	Soft Rush	G5	N5	S5
	<i>Juncus filiformis</i>	Thread Rush	G5	NNR	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Juncus pelocarpus</i>	Brown-Fruited Rush	G5	N5	S5
	<i>Luzula multiflora</i>	Common Woodrush	G5	N5	S5
Lamiaceae	<i>Clinopodium vulgare</i>	Wild Basil	G5	N5	S5
	<i>Galeopsis tetrahit</i>	Common Hemp-nettle	GNR	NNA	SNA
	<i>Glechoma hederacea</i>	Ground Ivy	GNR	NNA	SNA
	<i>Mentha arvensis</i>	Wild Mint	G5	N5	S5
	<i>Prunella vulgaris</i>	Common Self-heal	G5	N5	S5
	<i>Scutellaria galericulata</i>	Marsh Skullcap	G5	NNR	S5
	<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	G5	NNR	S5
	<i>Stachys arvensis</i>	Field Hedge-nettle	GNR	NNA	SNA
	Lemnaceae	<i>Lemna minor</i>	Lesser Duckweed	G5	NNR
Liliaceae	<i>Clintonia borealis</i>	Yellow Bluebead Lily	G5	NNR	S5
	<i>Erythronium americanum</i>	Yellow Trout Lily	G5	NNR	S4S5
	<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	G5	NNR	S5
	<i>Maianthemum racemosum</i>	Large False Solomon's Seal	G5	NNR	S4S5
	<i>Medeola virginiana</i>	Indian Cucumber Root	G5	NNR	S5
	<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	G5	NNR	S5
	<i>Trillium cernuum</i>	Nodding Trillium	G5	NNR	S4
	<i>Trillium undulatum</i>	Painted Trillium	G5	NNR	S5
Lycopodiaceae	<i>Huperzia lucidula</i>	Shining Firmoss	G5	N5	S5
	<i>Lycopodium annotinum</i>	Stiff Clubmoss	G5	N5	S5
	<i>Lycopodium obscurum</i>	Flat-branched Tree-clubmoss	G5	NNR	S4S5
Malvaceae	<i>Malva moschata</i>	Musk Mallow	GNR	NNA	SNA
Monotropaceae	<i>Monotropa hypopithys</i>	Pinesap	G5	NNR	S4
	<i>Monotropa uniflora</i>	Indian Pipe	G5	N5	S5
Myricaceae	<i>Comptonia peregrina</i>	Sweet-fern	G5	NNR	S5
	<i>Morella pensylvanica</i>	Northern Bayberry	G5	NNR	S5
Oleaceae	<i>Fraxinus americana</i>	White Ash	G5	NNR	S5
	<i>Fraxinus nigra</i>	Black Ash	G5	NNR	S1S2
	<i>Ligustrum vulgare</i>	European Privet	GNR	NNA	SNA
Onagraceae	<i>Chamerion angustifolium</i>	Fireweed	G5	NNR	S5
	<i>Circaea alpina</i>	Small Enchanter's Nightshade	G5	NNR	S5
	<i>Epilobium leptophyllum</i>	Bog Willowherb	G5	NNR	S5
	<i>Ludwigia palustris</i>	Marsh Seedbox	G5	NNR	S5
	<i>Oenothera biennis</i>	Common Evening Primrose	G5	N5	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Oenothera perennis</i>	Perennial Evening Primrose	G5	N4N5	S5
Orchidaceae	<i>Cypripedium acaule</i>	Pink Lady's-Slipper	G5	NNR	S5
	<i>Epipactis helleborine</i>	Helleborine	GNR	NNA	SNA
	<i>Malaxis unifolia</i>	Green Adder's-Mouth	G5	NNR	S4S5
	<i>Platanthera clavellata</i>	Club Spur Orchid	G5	NNR	S5
	<i>Platanthera dilatata</i>	White Bog Orchid	G5	NNR	S4S5
	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid	G5	NNR	S3
	<i>Platanthera lacera</i>	Ragged Fringed Orchid	G5	NNR	S4S5
	<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	G5	NNR	S4
	<i>Spiranthes cernua</i>	Nodding Ladies'-Tresses	G5	NNR	S5
Osmundaceae	<i>Osmunda cinnamomea</i>	Cinnamon Fern	G5	NNR	S5
	<i>Osmunda claytoniana</i>	Interrupted Fern	G5	NNR	S5
	<i>Osmunda regalis</i>	Royal Fern	G5	NNR	S5
Oxalidaceae	<i>Oxalis montana</i>	Common Wood Sorrel	G5	NNR	S5
Pinaceae	<i>Abies balsamea</i>	Balsam Fir	G5	N5	S5
	<i>Larix laricina</i>	Tamarack	G5	N5	S5
	<i>Picea abies</i>	Norway Spruce	G5	NNA	SNA
	<i>Picea glauca</i>	White Spruce	G5	N5	S5
	<i>Picea mariana</i>	Black Spruce	G5	N5	S5
	<i>Pinus strobus</i>	Eastern White Pine	G5	N5	S5
	<i>Pinus sylvestris</i>	Scotch Pine	GNR	NNA	SNA
	<i>Tsuga canadensis</i>	Eastern Hemlock	G5	N5	S4S5
Plantaginaceae	<i>Plantago lanceolata</i>	English Plantain	G5	NNA	SNA
	<i>Plantago major</i>	Common Plantain	G5	NNA	SNA
Poaceae	<i>Agrostis stolonifera</i>	Creeping Bent Grass	G5	N5	S5
	<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	G5	N5	S5
	<i>Cinna latifolia</i>	Drooping Wood Reed Grass	G5	NNR	S5
	<i>Dichanthelium acuminatum</i>	Woolly Panic Grass	G5	N5	S5
	<i>Glyceria canadensis</i>	Canada Manna Grass	G5	N4N5	S5
	<i>Glyceria melicaria</i>	Slender Manna Grass	G5	NNR	S4
	<i>Glyceria striata</i>	Fowl Manna Grass	G5	NNR	S5
	<i>Leersia oryzoides</i>	Rice Cut Grass	G5	NNR	S5
	<i>Lolium perenne</i>	Perennial Rye Grass	GNR	NNA	SNA
	<i>Milium effusum</i>	Tall Millet Grass	G5	N5	S4
	<i>Panicum capillare</i>	Common Witch Grass	G5	N5	SNA
<i>Phalaris arundinacea</i>	Reed Canary Grass	G5	N5	S5	

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Phleum pratense</i>	Common Timothy	GNR	NNA	SNA
	<i>Spartina pectinata</i>	Prairie Cord Grass	G5	NNR	S5
Polygonaceae	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	G5	NNR	S2
	<i>Polygonum cuspidatum</i>	Japanese Knotweed	GNR	NNA	SNA
	<i>Polygonum hydropiper</i>	Marshpepper Smartweed	GNR	NNR	SNA
	<i>Polygonum hydropiperoides</i>	False Waterpepper	G5	NNR	S5
	<i>Polygonum persicaria</i>	Spotted Lady's-thumb	G3G5	NNA	SNA
	<i>Rumex acetosella</i>	Sheep Sorrel	GNR	NNA	SNA
	<i>Rumex crispus</i>	Curled Dock	GNR	NNA	SNA
	Portulacaceae	<i>Claytonia virginica</i>	Narrow-Leaved Spring Beauty	G5	NNR
Potamogetonaceae	<i>Potamogeton epihydrus</i>	Ribbon-leaved Pondweed	G5	NNR	S5
Primulaceae	<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife	G5	N5	S4
	<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	G5	N5	S5
	<i>Trientalis borealis</i>	Northern Starflower	G5	NNR	S5
Pyrolaceae	<i>Pyrola elliptica</i>	Shinleaf	G5	NNR	S5
Ranunculaceae	<i>Actaea pachypoda</i>	White Baneberry	G5	NNR	S4
	<i>Actaea rubra</i>	Red Baneberry	G5	NNR	S5
	<i>Aquilegia vulgaris</i>	European Columbine	GNR	NNA	SNA
	<i>Clematis virginiana</i>	Virginia Clematis	G5	NNR	S5
	<i>Coptis trifolia</i>	Goldthread	G5	N5	S5
	<i>Ranunculus abortivus</i>	Kidney-Leaved Buttercup	G5	NNR	S4S5
	<i>Ranunculus acris</i>	Common Buttercup	G5	NNA	SNA
	<i>Ranunculus recurvatus</i>	Hooked Buttercup	G5	NNR	S4
	<i>Ranunculus repens</i>	Creeping Buttercup	GNR	NNA	SNA
	<i>Thalictrum pubescens</i>	Tall Meadow-Rue	G5	NNR	S5
Rosaceae	<i>Agrimonia striata</i>	Woodland Agrimony	G5	NNR	S5
	<i>Amelanchier canadensis</i>	Canada Serviceberry	G5	NNR	S4?
	<i>Fragaria virginiana</i>	Wild Strawberry	G5	NNR	S5
	<i>Geum rivale</i>	Water Avens	G5	NNR	S5
	<i>Malus pumila</i>	Common Apple	G5	NNA	SNA
	<i>Potentilla norvegica</i>	Rough Cinquefoil	G5	NNR	S5
	<i>Potentilla simplex</i>	Old Field Cinquefoil	G5	N5	S5
	<i>Prunus pensylvanica</i>	Pin Cherry	G5	NNR	S5
	<i>Prunus serotina</i>	Black Cherry	G5	N5	S5
	<i>Prunus virginiana</i>	Chokecherry	G5	NNR	S5
	<i>Rosa virginiana</i>	Virginia Rose	G5	NNR	S5
	<i>Rubus allegheniensis</i>	Alleghaney Blackberry	G5	N5	S5
	<i>Rubus idaeus</i>	Red Raspberry	G5	N5	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Sorbaria sorbifolia</i>	False Spiraea	G5	NNA	SNA
	<i>Sorbus americana</i>	American Mountain Ash	G5	NNR	S5
	<i>Spiraea alba</i>	White Meadowsweet	G5	N5	S5
	<i>Spiraea tomentosa</i>	Steeplebush	G5	N5	S5
Rubiaceae	<i>Galium mollugo</i>	Smooth Bedstraw	GNR	NNA	SNA
	<i>Mitchella repens</i>	Partridgeberry	G5	NNR	S5
Salicaceae	<i>Populus grandidentata</i>	Large-toothed Aspen	G5	NNR	S5
	<i>Populus tremuloides</i>	Trembling Aspen	G5	NNR	S5
	<i>Salix bebbiana</i>	Bebb's Willow	G5	NNR	S5
	<i>Salix discolor</i>	Pussy Willow	G5	NNR	S5
Saxifragaceae	<i>Chrysosplenium americanum</i>	American Golden Saxifrage	G5	NNR	S5
	<i>Mitella nuda</i>	Naked Bishop's-Cap	G5	NNR	S5
Scrophulariaceae	<i>Chelone glabra</i>	White Turtlehead	G5	NNR	S5
	<i>Digitalis purpurea</i>	Purple Foxglove	GNR	NNA	SNA
	<i>Euphrasia nemorosa</i>	Common Eyebright	G5	N5?	S5
	<i>Linaria vulgaris</i>	Butter-and-Eggs	GNR	NNA	SNA
	<i>Odontites vernus</i>	Red Bartsia	GNR	NNA	SNA
	<i>Rhinanthus minor</i>	Little Yellow Rattle	G5	N5	S5
	<i>Veronica officinalis</i>	Common Speedwell	G5	NNR	S5
	<i>Veronica serpyllifolia</i>	Thyme-Leaved Speedwell	G5	N5	S5
Solanaceae	<i>Solanum dulcamara</i>	Bittersweet Nightshade	GNR	NNA	SNA
Sparganiaceae	<i>Sparganium americanum</i>	American Burreed	G5	NNR	S5
Taxaceae	<i>Taxus canadensis</i>	Canada Yew	G5	N5	S5
Thelypteridaceae	<i>Phegopteris connectilis</i>	Northern Beech Fern	G5	NNR	S5
	<i>Thelypteris noveboracensis</i>	New York Fern	G5	NNR	S5
	<i>Thelypteris palustris</i>	Eastern Marsh Fern	G5	NNR	S5
Typhaceae	<i>Typha angustifolia</i>	Narrow-Leaved Cattail	G5	N5	S5
	<i>Typha latifolia</i>	Broad-leaved Cattail	G5	N5	S5
Ulmaceae	<i>Ulmus americana</i>	White Elm	G5?	NNR	S4
Verbenaceae	<i>Verbena hastata</i>	Blue Vervain	G5	NNR	S3
Violaceae	<i>Viola blanda</i>	Sweet White Violet	G4G5	NNR	S5
	<i>Viola cucullata</i>	Marsh Blue Violet	G4G5	NNR	S5

Table C-3. Lichen Species Detected in the Highway 104 Twinning Project Study Area by CBCL in 2018

Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
Baeomycetaceae	<i>Dibaeis baeomyces</i>	Pink Earth Lichen	G4G5	--	S5
Cladoniaceae	<i>Cladina arbuscula</i>	Reindeer Lichen	G5	--	S5
	<i>Cladina rangiferina</i>	Gray Reindeer Lichen	G5	--	S5
	<i>Cladina stellaris</i>	Star-tipped Reindeer Lichen	G5	--	S5
	<i>Cladonia cervicornis ssp. verticillata</i>	Ladder Lichen	G5TNR	--	S5
	<i>Cladonia coniocraea</i>	Common Pixie Powderhorn	G5	--	S5
	<i>Cladonia cornuta</i>	Bighorn Pixie Lichen	G3G5	--	S4?
	<i>Cladonia cristatella</i>	British Soldiers Lichen	G5?	--	S5
	<i>Cladonia multiformis</i>	Sieve Lichen	G3G5	--	S5
	<i>Cladonia squamosa</i>	Dragon Lichen	G4G5	--	S5
	<i>Cladonia uncialis</i>	Thorn Lichen	G4G5	--	S5
	<i>Pycnothelia papillaria</i>	Nipple Lichen	G3G5	--	S5
	Collemataceae	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen	GNR	NNR
<i>Collema subflaccidum</i>		Tree Tarpaper Lichen	G5?	NNR	S5
<i>Collema tenax</i>		Soil Tarpaper Lichen	--	--	S3
<i>Leptogium cyanescens</i>		Blue Jellyskin Lichen	G5	NNR	S5
<i>Leptogium subtile</i>		Appressed Jellyskin Lichen	GNR	NNR	S3
<i>Leptogium tenuissimum</i>		Birdnest Jellyskin Lichen	GNR	--	S2S3
<i>Leptogium teretiusculum</i>		Beaded Jellyskin Lichen	G4G5	--	S2?
<i>Leptogium acadiense</i>		a Lichen	--	--	--
Lecanoraceae	<i>Lecanora allophana</i>	a Lichen	--	--	--
	<i>Lecanora hybocarpa</i>	a Lichen	--	--	--
	<i>Lecanora caesiorubella</i>	a Lichen	--	--	--
Lobariaceae	<i>Lobaria pulmonaria</i>	Lungwort Lichen	G4G5	NNR	S5
	<i>Lobaria quercizans</i>	Smooth Lung Lichen	G4G5	NNR	S5
	<i>Lobaria scrobiculata</i>	Textured Lungwort Lichen	G4	N4	S5
	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	G4	NNR	S5
Nephromataceae	<i>Nephroma bellum</i>	Naked Kidney Lichen	G3G5	NNR	S3
	<i>Nephroma parile</i>	Powdery Kidney Lichen	G3G5	NNR	S4
Pannariaceae	<i>Degelia plumbea</i>	Blue Felt Lichen	GNR	NNR	S3
	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	G3G5	NNA	S2S3
	<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen	G3G4	NNR	S4
	<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen	G4G5	NNR	S4

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Parmeliella triptophylla</i>	Black-bordered Shingles Lichen	G3G5	NNR	S5
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	G4G5	NNR	S5
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	G5?	--	S3S4
Parmeliaceae	<i>Hypogymnia krogiae</i>	Freckled Tube Lichen	G3G4	--	S5
	<i>Hypogymnia physodes</i>	Monk's Hood Lichen	G5	--	S5
	<i>Melanelixia subaurifera</i>	Abrading Camouflage Lichen	G3G5	--	S5
	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen	G3G5	--	S3S4
	<i>Menegazzia subsimilis</i>	Tree Flute Lichen	--	--	S4
	<i>Menegazzia terebrata</i>	Magic Flute Lichen	G4?	--	S4
	<i>Parmelia squarrosa</i>	Bottlebrush Shield Lichen		--	S5
	<i>Parmelia sulcata</i>	Hammered Shield Lichen	G5	--	S5
	<i>Platismatia glauca</i>	Varied Rag Lichen	G5	--	S5
	<i>Tuckermannopsis ciliaris</i>	Fringed Wrinkle Lichen	G3G5	--	S4?
	<i>Tuckermannopsis orbata</i>	Variable Wrinkle Lichen		--	S5
	<i>Usnea cornuta</i>	Inflated Beard Lichen		--	S4S5
	<i>Usnea longissima</i>	Methuselah's Beard Lichen	G4	--	S4
	<i>Usnea strigosa</i>	Bushy Beard Lichen	G5?	--	S5
	Peltigeraceae	<i>Peltigera aphthosa</i>	Common Freckle Pelt Lichen	G5	--
<i>Peltigera canina</i>		Dog Lichen	G5	--	S5
<i>Peltigera didactyla</i>		Alternating Pelt Lichen	G5	--	S4S5
<i>Peltigera elisabethae</i>		Concentric Pelt Lichen	G5?	--	S4S5
<i>Peltigera evansiana</i>		Peppered Pelt Lichen	G4	--	S4S5
<i>Peltigera horizontalis</i>		Flat-fruited Pelt Lichen	G5	--	S5
<i>Peltigera lepidophora</i>		Scaly Pelt Lichen	G4	--	S1
<i>Peltigera membranacea</i>		Membranous Pelt Lichen	G4G5	--	S5
<i>Peltigera polydactylon</i>		Many-fruited Pelt Lichen	G5?	--	S5
<i>Peltigera praetextata</i>		Born-again Pelt Lichen	G3G5	--	S4S5
<i>Peltigera rufescens</i>		Black-bellied Pelt Lichen	G5	--	S4?
Physciaceae	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen	G3G5	--	S3S4
	<i>Heterodermia neglecta</i>	Fringe Lichen	--	--	S3S4
	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen	G5	--	S3?
	<i>Phaeophyscia rubropulchra</i>	Orange-cored Shadow Lichen	G5	--	S5
Ramalinaceae	<i>Ramalina americana</i>	Sinewed Ramalina Lichen	G4G5	--	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Ramalina dilacerata</i>	Punctured Ramalina Lichen	G3G5	--	S5
Sphaerophoraceae	<i>Sphaerophorus globosus</i>	Northern Coral Lichen	G4G5	--	S4
Stereocaulaceae	<i>Stereocaulon dactylophyllum</i>	Finger Foam Lichen	G4?	--	S5
Stereocaulaceae	<i>Stereocaulon tomentosum</i>	Woolly Foam Lichen	G5	--	S4S5
Parmeliaceae	<i>Cetrelia chicitae</i>	Frothing Seastorm Lichen	G5	--	S5
Verrucariaceae	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	G4G5	--	S3S4
Parmeliaceae	<i>Evernia mesomorpha</i>	Boreal Oakmoss Lichen	G5	--	S5
Parmeliaceae	<i>Punctelia rudecta</i>	Rough Speckleback Lichen	G5	--	S5
Physciaceae	<i>Pyxine sorediata</i>	Mustard Lichen	G5	--	S5
Teloschistaceae	<i>Xanthoria parietina</i>	Maritime Sunburst Lichen	G3G5	--	S5
Ramalinaceae	<i>Bacidia schweintzii</i>	a Lichen	--	--	--
Ramalinaceae	<i>Biatora vernalis</i>	a Lichen	--	--	--
Lobariaceae	<i>Dendriscoaulon intricatum</i>	a Lichen	--	--	--
Graphidaceae	<i>Graphis scripta</i>	a Lichen	--	--	--
Tephromelataceae	<i>Mycoblastus sanguinarioides</i>	a Lichen	--	--	--
Mycocaliciaceae	<i>Phaeocalicium polyporaenum</i>	a Lichen	--	--	--
Fuscideaceae	<i>Ropalospora chlorantha</i>	a Lichen	--	--	--

Table C-4. Moss and Liverwort Species Detected in the Highway 104 Twinning Project Study Area by CBCL in 2018

Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
Amblystegiaceae	<i>Amblystegium varium</i>	Willow Feather Moss	G5	NNR	S5
	<i>Calliergon cordifolium</i>	Heart-leaved Spear Moss	G5	NNR	S4S5
	<i>Campylium chrysophyllum</i>	Golden Creeping Moss	G5	NNR	S5
	<i>Hygroamblystegium fluviatile</i>	Brookside Feather Moss	G5	NNR	S4S5
	<i>Hygroamblystegium tenax</i>	Fountain Feather Moss	G5	NNR	S5
Andreaeaceae	<i>Andreaea rupestris</i>	Black Rock Moss	G5	NNR	S5
Aneuraceae	<i>Riccardia chamedryfolia</i>	Jagged Germanderwort	G5	NNR	SU
	<i>Riccardia latifrons</i>	Bog Germanderwort	G4G5	NNR	S5
Anomodontaceae	<i>Anomodon attenuatus</i>	Slender Anomodon Moss	G5	NNR	S5
	<i>Anomodon rostratus</i>	Common Anomodon Moss	G5	NNR	S5
Bartramiaceae	<i>Bartramia pomiformis</i>	Common Apple Moss	G5	NNR	S5
	<i>Philonotis fontana</i>	Fountain Apple Moss	G5	NNR	S5
Brachytheciaceae	<i>Brachythecium acuminatum</i>	Acuminate Ragged Moss	G5	NNR	SU
	<i>Brachythecium campestre</i>	Field Ragged Moss	G4G5Q	NNR	S5
	<i>Brachythecium plumosum</i>	Rusty Ragged Moss	G5	NNR	S5
	<i>Brachythecium rivulare</i>	River Ragged Moss	G5	NNR	S5
	<i>Brachythecium velutinum</i>	Velvet Ragged Moss	G5	NNR	S4S5
	<i>Bryhnia novae-angliae</i>	New England Bryhnia Moss	G5	NNR	S5
	<i>Eurhynchium pulchellum</i>	Elegant Beaked Moss	G5	NNR	S5
Bryaceae	<i>Bryum capillare</i>	Capillary Bryum Moss	G5	NNR	S4
	<i>Bryum pseudotriquetrum</i>	Common Green Bryum Moss	G5	NNR	S5
Cephaloziaceae	<i>Nowellia curvifolia</i>	Wood Rustwort	G5	NNR	S5
Climaciaceae	<i>Climacium dendroides</i>	Northern Tree Moss	G5	NNR	S5
Dicranaceae	<i>Dicranella heteromalla</i>	Silky Forklet Moss	G5?	NNR	S5
	<i>Dicranella varia</i>	a Moss	G5	NNR	S3S4
	<i>Dicranum fuscescens</i>	Curly Heron's-bill Moss	G5	NNR	S5
	<i>Dicranum montanum</i>	Mountain Broom Moss	G5	NNR	S5
	<i>Dicranum polysetum</i>	Wavy-leaved Broom Moss	G5	NNR	S5
	<i>Dicranum scoparium</i>	Common Broom Moss	G5	NNR	S5
	<i>Dicranum viride</i>	Green Broom Moss	G5	NNR	S5
	<i>Rhabdoweisia crispata</i>	a Moss	G5	NNR	S4?
Diphysciaceae	<i>Diphyscium foliosum</i>	a Moss	G5	NNR	S5
Fissidentaceae	<i>Fissidens adianthoides</i>	Maidenhair Pocket Moss	G5	NNR	S5
	<i>Fissidens bryoides</i>	Lesser Pocket Moss	G5	NNR	S4?
	<i>Fissidens dubius</i>	Rock Pocket Moss	G5	NNR	S5
	<i>Fissidens exilis</i>	Pygmy Pocket Moss	G3G4	N1	S1S2
	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss	G5	NNR	S2?
Fontinalaceae	<i>Fontinalis antipyretica</i> var. <i>gigantea</i>	Greater Water Moss	G5TNR	NNR	S4?
	<i>Fontinalis dalecarlica</i>	a Moss	G3G5	NNR	S5
Gymnomitriaceae	<i>Marsupella emarginata</i>	Notched Rustwort	G5	NNR	S5
Hedwigiaceae	<i>Hedwigia ciliata</i>	Ciliate Hedwigia Moss	G5	NNR	S5
Hylocomiaceae	<i>Hylocomiastrum umbratum</i>	a Feather Moss	G5	NNR	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
	<i>Hylocomium splendens</i>	Stairstep Moss	G5	NNR	S5
	<i>Rhytidiadelphus subpinnatus</i>	a Moss	GU	NNR	S5
	<i>Rhytidiadelphus triquetrus</i>	Electrified Cat's-tail Moss	G5	NNR	S5
Hylocomiaceae	<i>Pleurozium schreberi</i>	Red-stemmed Feather Moss	G5	NNR	S5
Hypnaceae	<i>Callicladium haldanianum</i>	Beautiful Branch Moss	G5	NNR	S5
	<i>Hypnum cupressiforme</i>	Cypress-leaved Plait Moss	G5	NNR	S5
	<i>Hypnum fauriei</i>	a Moss	G5	NNR	SU
	<i>Hypnum impones</i>	(blank)	(blank)	(blank)	(blank)
	<i>Hypnum lindbergii</i>	Lindberg's Plait Moss	G5	NNR	S5
	<i>Hypnum pallescens</i>	Stump Plait Moss	G5	NNR	S5
	<i>Isopterygiopsis muelleriana</i>	a Moss	G5	NNR	S5
	<i>Ptilium crista-castrensis</i>	Knight's Plume Moss	G5	NNR	S5
	<i>Pylaisia intricata</i>	a Moss	G4	NNR	S5
	<i>Pylaisiella polyantha</i>	Many-flowered Leskea Moss	G5	NNR	S5
	<i>Pylaisiella selwynii</i>	a Moss	G5	N5	S4?
Jubulaceae	<i>Frullania eboracensis</i>	York Scalewort	G5	NNR	S5
Jungermanniaceae	<i>Jungermannia lanceolata</i>	a Moss	(blank)	(blank)	S5
Lepidoziaceae	<i>Bazzania trilobata</i>	Three-lobed Whipwort	G5	NNR	S5
	<i>Lepidozia reptans</i>	Creeping Fingerwort	G5	NNR	S5
Leucobryaceae	<i>Leucobryum glaucum</i>	White Pincushion Moss	G5	NNR	S5
Leucodontaceae	<i>Leucodon andrewsianus</i>	a Moss	G5T5	NNR	S4
	<i>Leucodon brachypus</i>	a Moss	G5	NNR	S5
Metzgeriaceae	<i>Metzgeria furcata</i>	Forked Veilwort	G5	NNR	S4?
Mniaceae	<i>Mnium hornum</i>	Swan's-neck Leafy Moss	G5	NNR	S5
	<i>Plagiomnium cuspidatum</i>	Woodsy Leafy Moss	G5	NNR	S5
	<i>Pseudobryum cinclidioides</i>	River Thyme Moss	G5	NNR	S5
	<i>Rhizomnium magnifolium</i>	Large-leaved Leafy Moss	G4G5	NNR	S4
	<i>Rhizomnium punctatum</i>	Dotted Leafy Moss	G5	NNR	S5
	<i>Rhodobryum ontariense</i>	Ontario Rose Moss	G5	NNR	S4?
Neckeraceae	<i>Homalia trichomanoides</i>	Common Flat-branch Moss	G5	NNR	S4?
	<i>Neckera complanata</i>	a Moss	G5	NNR	S5
	<i>Neckera pennata</i>	Feathery Neckera Moss	G5	NNR	S5
Orthotrichaceae	<i>Orthotrichum sordidum</i>	Darkgreen Bristle Moss	G5	NNR	S5
	<i>Ulota coarctata</i>	a Moss	G5	NNR	S5
	<i>Ulota crispa</i>	Crisped Pincushion Moss	G5	NNR	S5
Pelliaceae	<i>Pellia epiphylla</i>	Common Pellia	G5	NNR	S5
Plagiochilaceae	<i>Plagiochila porelloides</i>	Lesser Featherwort	G5	NNR	S5
Plagiotheciaceae	<i>Plagiothecium cavifolium</i>	Round Silk Moss	G5	NNR	S5
	<i>Plagiothecium laetum</i>	Bright Silk Moss	G5	NNR	S5
Polytrichaceae	<i>Atrichum crispulum</i>	a Moss	(blank)	(blank)	SU
	<i>Pogonatum pensilvanicum</i>	a Moss	G5	NNR	S4S5
	<i>Polytrichum commune</i>	Common Haircap Moss	G5	NNR	S5
	<i>Polytrichum juniperinum</i>	Juniper Haircap Moss	G5	NNR	S5
Polytrichaceae	<i>Polytrichastrum alpinum</i>	Alpine Haircap Moss	G4G5	NNR	S5
Porellaceae	<i>Porella platyphylla</i>	Wall Scalewort	G5	NNR	S5

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Family	Scientific Name	Common Name	Global Rank	National Rank	NS S-RANK
Pseudolepicoleaceae	<i>Blepharostoma trichophyllum</i>	Hairy Threadwort	G5	NNR	S5
Pterigynandraceae	<i>Pterigynandrum filiforme</i>	Capillary Wing Moss	G4G5	NNR	S5
Ptilidiaceae	<i>Ptilidium ciliare</i>	Ciliate Fringewort	G5	NNR	S5
	<i>Ptilidium pulcherrimum</i>	Tree Fringewort	G5	NNR	S5
Radulaceae	<i>Radula complanata</i>	Flat-leaved Scalewort	G4	NNR	S5
Scapaniaceae	<i>Diplophyllum taxifolium</i>	Yew-leaved Earwort	G5	NNR	S5
	<i>Scapania nemorosa</i>	Grove Earwort	G5	NNR	S5
Sphagnaceae	<i>Sphagnum angustifolium</i>	Narrowleaf Peatmoss	G5	NNR	S5
	<i>Sphagnum capillifolium</i>	Northern Peatmoss	G5	NNR	S5
	<i>Sphagnum fallax</i>	Flat-top Peat Moss	G5	NNR	S5
	<i>Sphagnum girgensohnii</i>	Green Peat Moss	G5	NNR	S5
	<i>Sphagnum magellanicum</i>	Magellan's Peat Moss	G5	NNR	S5
	<i>Sphagnum palustre</i>	Blunt-leaved Peat Moss	G5	NNR	S5
	<i>Sphagnum squarrosum</i>	Shaggy Peat Moss	G5	NNR	S5
	<i>Sphagnum wulfianum</i>	Wulf's Peat Moss	G5	NNR	S5
Tetraphidaceae	<i>Tetraphis pellucida</i>	Common Four-tooth Moss	G5	NNR	S5
Thuidiaceae	<i>Thuidium delicatulum</i>	Delicate Fern Moss	G5	NNR	S5
Trichocoleaceae	<i>Trichocolea tomentella</i>	Woolly Liverwort	G5	NNR	S5
Conocephalaceae	<i>Conocephalum salebrosum</i>	Snake Liverwort	G5	NNR	S5