

## Friends of the Connell Memorial Herbarium

Field Trip to ESA Zealand Station Delta Terraces Site ID #511

24 June 2014

### General Information



Map 1. Location From ESA database

PARISH: BRIGHTON, COUNTY: York, TYPE: ESA,

**Location and Description** UTM Zone: 19

UT M East: 660000, UTM North: 5102000

**Location:** Upstream from Keswick, along Route 104.  
See Map 1.

**Notable Wildlife and Geographic Features:** Geology and plant

**Description:** During the late glacial marine flooding of the Saint John River system, a large outwash delta was formed in the Keswick River valley, upstream from Zealand Station. Subsequent stream erosion has left large segments of the delta as terraces, up to 35m high, along the valley walls. *Panicum linearifolium* is found on sandy softwoods, gravel banks and roadsides.

### INTRODUCTION

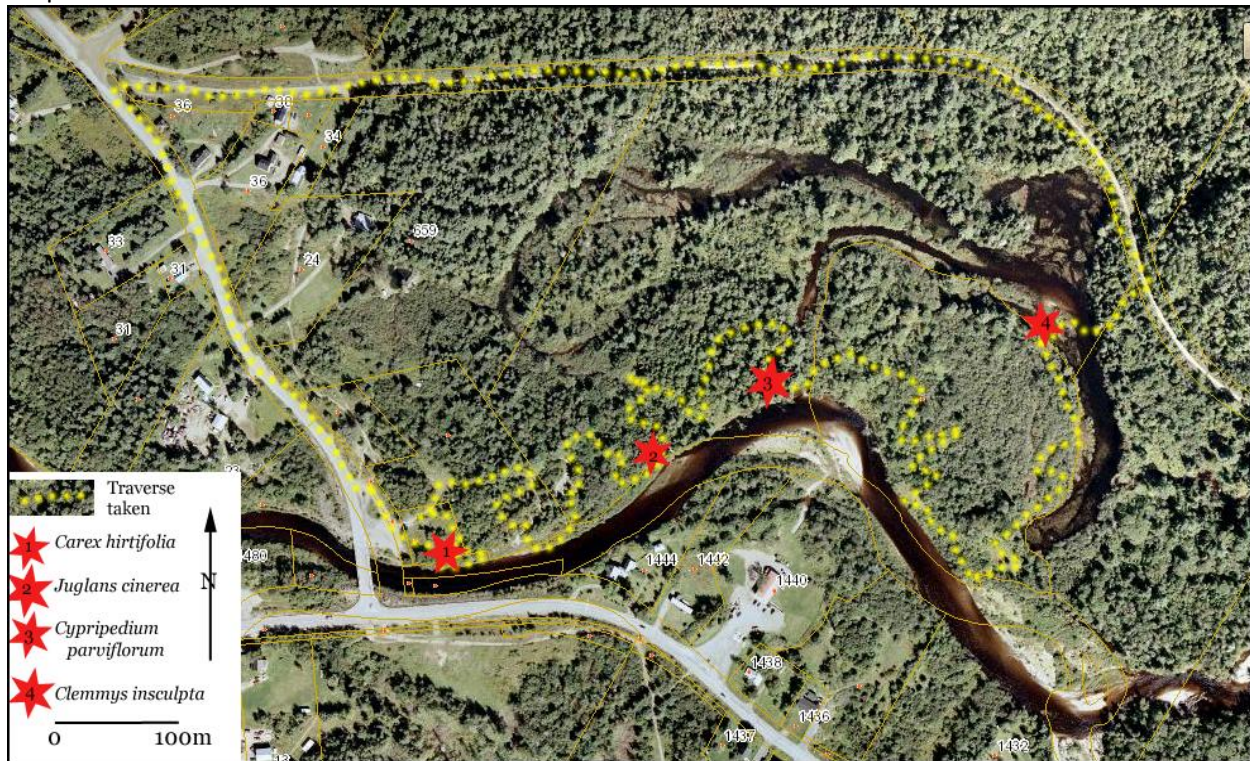
Two members of the Friends of the Herbarium, Robyn Shortt and Gart Bishop undertook a 1 day survey of this ESA on the 24<sup>th</sup> of June 2014. They restricted their traverse (see Map 2) to the north side of the Keswick River east of the road . They observed 154 vascular plant species, including one S1 species, *Juglans cinerea* (Butternut), one S2 species *Carex hirtifolia* (Hairy Sedge) and one S3 species *Cypripedium parviflorum* var. *pubescens* (Yellow Lady's Slipper).

In addition to the vascular plants, a wood turtle (*Clemmys insculpta*) was observed.

### RESULTS

The area surveyed was for the most part free of trash. There were multiple old woods roads especially near the main road. In the eastern portion covered, *the was a* abundant blowdown which made walking at times difficult.

Map 2



### Rare Species

1. *Juglans cinerea*/Butternut (S1) is a species that has been found principally in flood plains and uplands within 5 km of the Saint John River. There were only a couple of trees observed at one location and as nothing was collected the location on Map 2 is a guess.

The following is taken from the Government of Canada 'Species at Risk Public Registry':

The Butternut is a small to medium-sized tree with a broad and irregularly shaped crown. It is a member of the walnut family, and is rarely more than 30 m tall and 90 cm in diameter. The bark of younger trees is grey and smooth, becoming irregularly ridged as the trees mature. Unless the soil is shallow, the tree commonly generates a taproot and numerous deep, wide-spreading roots on either side. The Butternut is particularly recognizable by its compound leaves, which are made up of 11 to 17 leaflets arranged in a feather-like pattern opposite one another. Leaflets are 9 to 15 cm long and are almost stalkless. The ovoid fruit is a nut that contains a single seed, and measures 4 to 6 cm in length. The nut of the Butternut tree is edible and is protected by a rigid shell with jagged ridges. The shell in turn is covered by a green and hairy husk.

The Butternut is a relatively short-lived tree, rarely exceeding 75 years.

The most serious and widespread threat currently faced by the Butternut is Butternut canker. The most obvious symptom of the disease is the formation of elongated sunken cankers. In spring, a black fluid seeps from the canker. In summer, the cankers produce very black, often white-bordered spots on the tree. In the United States, the Butternut mortality rate due to this fungus reaches levels of up to 77 percent in some States. Butternut canker has spread northward and eastward, and is now encountered in the three Canadian provinces where the tree is present. Without knowing Butternut mortality rates in Canada, it is nonetheless possible to forecast rates similar to those reported in the United States. There is no known means of

fighting Butternut canker. It is not known whether the Butternut has any natural resistance to this fungus.

The Canadian Wildlife Service in Ontario initiated a national approach to Butternut recovery and oversaw the development of a national Recovery Strategy. Several initiatives have been undertaken by various groups and agencies since the discovery of Butternut canker in Canada.

- In New Brunswick, a Butternut conservation strategy was developed by the New Brunswick Gene Conservation Working Group
- Conservation initiatives were undertaken by the National Tree Seed Centre in order to preserve valuable Butternut germplasm (e.g. buds and cells)
- A database was set up by the CFS Atlantic Forestry Centre to maintain information provided by the public on the location and health of trees
- In Ontario, the provincial government (Ontario Ministry of Natural Resources) initiated a Butternut conservation project for southern Ontario in 1994 with goals of locating, identifying, grafting, and maintaining potentially resistant individuals in order to establish a breeding program and ultimately a species recovery program, and to develop a long-term conservation strategy for the Butternut in Ontario
- In Quebec, in 1994 the CFS and the provincial government (Ministère des Ressources naturelles et de la Faune) assessed the genetic variability of Butternut, researched the biology of the fungal pathogen, and tried to establish a conservation strategy.

The Butternut is protected under the federal Species at Risk Act (SARA), and was added to the list of endangered species in the New Brunswick in 2013.

At many sites in the province, the butternut trees have become infected and died or are dying.



2. *Carex hirtifolia*/Hairy Sedge (S2) Known mostly from near the lower St. John River, this species is known from less than 20 sites in the province. Its typical habitat is rocky floodplains and dry rich woods. It was found in the Zealand ESA only in one location along the margin of an old bush road in shaded woods. *C. hirtifolia* is unusual in the sedges in having a hairy seed (perigynia) and hairy leaves.

Arsenault et al (2013) mention that this species grows in loose tufts and that it is rare in Maine. It is listed as S2S3 in Nova Scotia, S3 in Quebec, S5 in Ontario. This species reaches its eastern limit in Nova Scotia and northern limit in New Brunswick. Its general range is from Nova Scotia to Minnesota south to the District of Columbia. It is more common in the western portion of its range.



Site of *Carex hirtifolia*, 30 m in from the parking lot.

Photo: R. Short

### 3. *Cypripedium parviflorum* var. *pubescens* / Larger Yellow Lady's Slipper (S3)

New Brunswick is host to 2 varieties of *C. parviflorum*, that can be difficult to tell apart. The larger size (3-5cm) of the labellum (the slipper part of the flower), the hairy basal sheaths and the long lateral petals (5-8cm) are good indicators for this variety.

This species is usually found in lime rich soils and is known to live for over 80 years if left unmolested. Its general range extends from Nova Scotia to Saskatchewan south to Montana and Georgia. Several small populations were observed in the general location indicated on Map 2.

### 4. *Clemmys insculpta* /Wood Turtle (S2S3)

The Wood Turtle, *Clemmys insculpta*, is widespread in New Brunswick but only locally common. The species is distributed from Nova Scotia to eastern Minnesota south to northern Virginia, but has disappeared or is in decline over much of its range. The Wood Turtle is now considered rare in Ontario, uncommon to rare through New England, and endangered in Wisconsin. (McAlpine 2015)

This area was selected as an ESA based on the flood plain terraces which are indicative of what can be found along many places of the lower St. John River. The following typical floodplain species observed were:

*Actaea rubra* (Red Baneberry)

*Ageratina altissima* (White Snakeroot)

*Agrimonia striata* (Striate Agrimony)

*Amphicarpaea bracteata* (Hog-peanut)

*Anemone canadensis* (Canada Anemone)

*Anemone quinquefolia* (American Wood Anemone)

*Arisaema triphyllum* (Jack-in-the-pulpit)

*Brachyelytrum septentrionale* (Bearded Short-husk)

*Campanula rotundifolia* (Bluebell)

*Carex flava* (Yellow Sedge)

*Carex hirtifolia* (Hairy Sedge)

*Carex pedunculata* (Peduncled Sedge)

*Circaea lutetiana* (Lutetian Enchanter's Nightshade)

*Cypripedium parviflorum* (Yellow Lady's-slipper)

*Erythronium americanum* (Dog-toothed Violet)

*Fraxinus nigra* (Black Ash)

*Laportea canadensis* (Wood Nettle)

*Maianthemum stellatum* (Starry False Solomon's Seal)

*Matteuccia struthiopteris* (Ostrich Fern)

*Poa alsodes* (Grove Meadow-grass)

*Ranunculus abortivus* (Kidney-leaf Buttercup)

*Ranunculus hispidus* (Northern Crowfoot)

*Ranunculus recurvatus* (Hooked Buttercup)

*Sanguinaria canadensis* (Bloodroot)

*Sanicula marilandica* (Black Snakeroot)

*Solidago flexicaulis* (Zigzag Goldenrod)

*Tiarella cordifolia* (Foamflower)

*Toxicodendron rydbergii* (Poison Ivy)

*Trillium erectum* (Purple Trillium)

*Ulmus americana* (American Elm)

*Uvularia sessilifolia* (Wild Oats)

*Veratrum viride* (False Hellebore)

*Viola pubescens* (Smooth Yellow Violet)

A complete listing of species observed is included in Appendix 1. Specimens that were collected are to be donated to the Connell Memorial Herbarium in Fredericton, NB.

## REFERENCES

Arsenault, M., G.H Mittelhouser, D. Cameron, A. Dibble, A. Haines, S. Rooney and J Weber. 2013.

*Sedges of Maine, A Field Guide to Cyperaceae*. The University of Maine Press, Orono ME.

Hinds, H.R. 2000. Flora of New Brunswick, 2<sup>nd</sup> Edition. Dept. of Biology, UNB. Fredericton NB.

McAlpine, D. 2015. Chickadee Notes #11, The Wood Turtle in New Brunswick. The New Brunswick Museum.

## Appendix 1

### List of Species Observed

<b>Botanical Name</b>	<b>Common Name</b>	<b>S rank</b>
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Acer negundo</i>	Manitoba Maple	SNA
<i>Acer rubrum</i>	Red Maple	S5
<i>Acer saccharum</i>	Sugar Maple	S4S5
<i>Achillea millefolium</i>	Yarrow	S5
<i>Actaea rubra</i>	Red Baneberry	S5
<i>Ageratina altissima</i>	White Snakeroot	S4S5
<i>Agrimonia striata</i>	Striate Agrimony	S5
<i>Agrostis perennans</i>	Ticklegrass	S5
<i>Alisma triviale</i>	Water Plantain	S5
<i>Alnus incana</i> ssp. <i>rugosa</i>	Speckled Alder	S5
<i>Amelanchier</i> sp.	Serviceberry	-
<i>Amphicarpaea bracteata</i>	Hog-peanut	S4S5
<i>Anemone canadensis</i>	Canada Anemone	S5
<i>Anemone quinquefolia</i>	American Wood Anemone	S4
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5
<i>Arisaema triphyllum</i> ssp. <i>stewardsonii</i>	Jack-in-the-pulpit	S4S5
<i>Asclepias syriaca</i>	Common Milkweed	S4S5
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady-fern	S5
<i>Barbarea vulgaris</i>	Winter Cress	SNA
<i>Betula alleghaniensis</i>	Yellow Birch	S5
<i>Betula cordifolia</i>	Heart-leaved Birch	S5
<i>Betula papyrifera</i>	White Birch	S5
<i>Betula populifolia</i>	Grey Birch	S5
<i>Brachyelytrum septentrionale</i>	Bearded Short-husk	S5
<i>Bromus inermis</i>	Smooth Brome-grass	SNA
<i>Calamagrostis canadensis</i>	Blue-stem	S5
<i>Calystegia sepium</i> ssp. <i>americana</i>	Hedge Bindweed	S5
<i>Campanula rotundifolia</i>	Bluebell	S5
<i>Cardamine pensylvanica</i>	Pennsylvania Bitter Cress	S5
<i>Carex arctata</i>	Compressed Sedge	S5
<i>Carex canescens</i> var. <i>disjuncta</i>	Silvery Sedge	S5
<i>Carex communis</i>	Common Sedge	S5
<i>Carex crinita</i>	Fringed Sedge	S5
<i>Carex deweyana</i>	Dewey's Sedge	S5
<i>Carex echinata</i>	Bur Sedge	S5
<i>Carex flava</i>	Yellow Sedge	S5
<i>Carex gracillima</i>	Filiform Sedge	S5
<i>Carex gynandra</i>	Gynandrous Sedge	S5
<i>Carex hirtifolia</i>	Hairy Sedge	S2
<i>Carex intumescens</i>	Bladder Sedge	S5

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<b>Botanical Name</b>	<b>Common Name</b>	<b>S rank</b>
<i>Carex lenticularis</i>	Lenticular Sedge	S5
<i>Carex leptoneuria</i>	Ribless Woodland Sedge	S5
<i>Carex pedunculata</i>	Peduncled Sedge	S5
<i>Carex projecta</i>	Spreading Sedge	S5
<i>Carex scabrata</i>	Rough Sedge	S5
<i>Carex stipata</i>	Stipitate Sedge	S5
<i>Carex torta</i>	Twisted Sedge	S5
<i>Carex vesicaria</i>	Inflated Sedge	S5
<i>Circaea alpina</i>	Dwarf Enchanter's Nightshade	S5
<i>Circaea lutetiana</i> subsp. <i>canadensis</i>	Lutetian Enchanter's Nightshade	S4
<i>Cirsium muticum</i>	Swamp Thistle	S5
<i>Cornus alternifolia</i>	Alternate-leaf Dogwood	S5
<i>Cornus canadensis</i>	Bunchberry	S5
<i>Cornus sericea</i>	Red-osier Dogwood	S5
<i>Corylus cornuta</i>	Beaked Hazelnut	S5
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper	S3
<i>Danthonia spicata</i>	Wild-oat Grass	S5
<i>Doellingeria umbellata</i>	Flat-topped White Aster	S5
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	S5
<i>Dryopteris cristata</i>	Crested Wood Fern	S5
<i>Dryopteris intermedia</i>	Glandular Wood Fern	S5
<i>Dryopteris X bootii</i>	Boott's Fern	SNA
<i>Echinocystis lobata</i>	Wild Cucumber	S5
<i>Equisetum arvense</i>	Common Field Horsetail	S5
<i>Equisetum fluviatile</i>	Water Horsetail	S5
<i>Erigeron strigosus</i>	Daisy Fleabane	S5
<i>Erythronium americanum</i>	Dog-toothed Violet	S5
<i>Eupatorium maculatum</i>	Joe-pye-weed	S5
<i>Fagus grandifolia</i>	Beech	S5
<i>Fallopia cilioides</i>	Fringed Black Bindweed	S5
<i>Festuca pratensis</i>	Meadow Fescue	SNA
<i>Fraxinus nigra</i>	Black Ash	S5
<i>Galium asprellum</i>	Rough Bedstraw	S5
<i>Glyceria striata</i> var. <i>striata</i>	Fowl Manna-grass	S5
<i>Gymnocarpium dryopteris</i>	Oak Fern	S5
<i>Hieracium X flagellare</i>	Hawkweed	SNA
<i>Hieracium X floribundum</i>	Yellow Devil	SNA
<i>Hydrocotyle americana</i>	Water-pennywort	S5
<i>Hylotelephium telephium</i>	Live-forever	SNA
<i>Impatiens capensis</i>	Spotted Touch-me-not	S5
<i>Iris versicolor</i>	Larger Blueflag	S5

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<b>Botanical Name</b>	<b>Common Name</b>	<b>S rank</b>
<i>Juglans cinerea</i>	Butternut	S1
<i>Juncus effusus</i>	Soft Rush	S5
<i>Laportea canadensis</i>	Wood Nettle	S5
<i>Larix laricina</i>	Tamarack	S5
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	SNA
<i>Luzula acuminata</i>	Acuminate Wood-rush	S5
<i>Lycopus americanus</i>	Water Horehound	S5
<i>Lysimachia terrestris</i>	Swamp candles	S5
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	S5
<i>Maianthemum stellatum</i>	Starry False Solomon's Seal	S4S5
<i>Matteuccia struthiopteris</i>	Ostrich Fern	S5
<i>Mentha canadensis</i>	Common Mint	S5
<i>Moehringia lateriflora</i>	Grove Sandwort	S5
<i>Oclemena acuminata</i>	Whorled Wood Aster	S5
<i>Oenothera parviflora</i>	Evening Primrose	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Oryzopsis asperifolia</i>	Rough Mountain-rice	S5
<i>Osmunda claytoniana</i>	Interrupted Fern	S5
<i>Oxalis stricta</i>	Yellow Wood Sorrel	S5
<i>Panicum acuminatum</i> var. <i>fasciculatum</i>	Panic-grass	S5
<i>Phalaris arundinacea</i>	Reed Canary-grass	S5
<i>Phegopteris connectilis</i>	Northern Beech Fern	S5
<i>Phleum pratense</i>	Common Timothy	SNA
<i>Picea glauca</i>	White Spruce	S5
<i>Pimpinella saxifraga</i>	Burnet Saxifrage	SNA
<i>Pinus strobus</i>	White Pine	S5
<i>Poa alsodes</i>	Grove Meadow-grass	S4
<i>Poa palustris</i>	Fowl Meadow-grass	S5
<i>Populus balsamifera</i>	Balsam Poplar	S5
<i>Potamogeton epiphydrus</i>	Emerged Pondweed	S5
<i>Potentilla simplex</i>	Common Cinquefoil	S5
<i>Prunus virginiana</i>	Choke-cherry	S5
<i>Pteridium aquilinum</i>	Bracken Fern	S5
<i>Pyrola asarifolia</i>	Pink Pyrola	S5
<i>Pyrola elliptica</i>	Shinleaf	S5
<i>Ranunculus abortivus</i>	Kidney-leaf Buttercup	S5
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Northern Crowfoot	S4S5
<i>Ranunculus recurvatus</i>	Hooked Buttercup	S4
<i>Ranunculus trichophyllus</i> var.	Northeastern White Water Crowfoot	S4S5
<i>Rubus idaeus</i> var. <i>strigosus</i>	Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Raspberry	S5



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<b>Botanical Name</b>	<b>Common Name</b>	<b>S rank</b>
<i>Salix eriocephala</i>	Red-tipped Willow	S5
<i>Salix lucida</i>	Shining Willow	S5
<i>Salix sericea</i>	Silky Willow	S5
<i>Sanguinaria canadensis</i>	Bloodroot	S4S5
<i>Sanicula marilandica</i>	Black Snakeroot	S4S5
<i>Scirpus microcarpus</i>	Red-sheathed Bulrush	S5
<i>Silene vulgaris</i>	Bladder-campion	SNA
<i>Sisyrinchium montanum</i>	Blue-eyed Grass	S5
<i>Solanum dulcamara</i>	Deadly Nightshade	SNA
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	S5
<i>Solidago juncea</i>	Early Goldenrod	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Sparganium</i> sp.	Bur-reed	-
<i>Spiraea alba</i> var. <i>latifolia</i>	Meadowsweet	S5
<i>Streptopus lanceolatus</i>	Rose Twisted Stalk	S5
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	S5
<i>Thuja occidentalis</i>	Eastern White Cedar	S5
<i>Tiarella cordifolia</i>	Foamflower	S4
<i>Toxicodendron rydbergii</i>	Poison Ivy	S5
<i>Trientalis borealis</i>	Starflower	S5
<i>Trifolium aureum</i>	Yellow Clover	SNA
<i>Trifolium pratense</i>	Red Clover	SNA
<i>Trillium erectum</i>	Purple Trillium	S5
<i>Tussilago farfara</i>	Coltsfoot	S4S5
<i>Ulmus americana</i>	American Elm	S4S5
<i>Uvularia sessilifolia</i>	Wild Oats	S5
<i>Veratrum viride</i>	False Hellebore	S4
<i>Veronica americana</i>	American Brooklime	S5
<i>Vicia cracca</i>	Cow Vetch	SNA
<i>Viola pubescens</i> var. <i>scabriuscula</i>	Smooth Yellow Violet	SD4/S5
<i>Zizia aurea</i>	Golden Alexanders	S4

## Appendix 2

### Vascular Plant Specimens Collected 24 June 2014 ESA #511 Zealand Delta Terraces

Botanical Name		Collection Date / Common Name / French Name		Habitat/Location	Coll #	
Agrostis perennans (Walt.) Tuckerm.		24 June 2014	Ticklegrass	Agrostis pérennant	sandy bank of Keswick River Zealand, east of Bridge over Keswick R., north side	Coll # 14-149.1 Lat 46.05482 Long 66.93101
<b>Abundance</b>	<b>Notes</b>					
Carex hirtifolia Mack.		24 June 2014	Hairy Sedge		margin of old road in flood plain Zealand, east of Bridge over Keswick R., north side	Coll # 14-148 Lat 46.05435 Long 66.93362
<b>Abundance</b>	<b>Notes</b>	uncommon	wide leaves, loose clump, with Fraxinus pennsylvanica, Actaea rubra, Arisaema triphyllum			
Carex lenticularis Michx.		24 June 2014	Lenticular Sedge	Carex lenticulaire	margin of breached beaver pond Zealand, east of Bridge over Keswick R., north side	Coll # 14-152 Lat 45.05435 Long 66.92717
<b>Abundance</b>	<b>Notes</b>	common	with Eleocharis acicularis, Veronica americana			
Carex projecta Mack.		24 June 2014	Spreading Sedge	Carex à bec étalé	sandy bank of Keswick River Zealand, east of Bridge over Keswick R., north side	Coll # 14-151 Lat 46.05500 Long 66.92796
<b>Abundance</b>	<b>Notes</b>	scattered				
Festuca pratensis Hudson		24 June 2014	Meadow Fescue	Fétuque des prés	sandy bank of Keswick River Zealand, east of Bridge over Keswick R., north side	Coll # 14-149.2 Lat 46.05482 Long 66.93101
<b>Abundance</b>	<b>Notes</b>					
Poa alsodes Gray		24 June 2014	Grove Meadow-grass	Pâturin des bosquets	in Fraxinus americana, Abies balsamea floodplain forest Zealand, east of Bridge over Keswick R., north side	Coll # 14-150 Lat 46.05605 Long 66.93010
<b>Abundance</b>	<b>Notes</b>	in loose clumps	with Toxicodendron rydbergii			