



Atlantic Canada Conservation Data Centre
Centre de données sur la conservation du Canada atlantique

*Assembling and providing knowledge about species and ecological communities
in Atlantic Canada, in support of decision-making, research, and education*

Rare Vascular Plant Surveys in the Polletts Cove and LaHave River areas of Nova Scotia



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PHOTOGRAPHY CREDITS

All photographs included in this report were taken by the authors.

INTRODUCTION

This project, funded by the Nova Scotia Species at Risk Conservation Fund, focused on two areas of high potential for rare plant occurrence: 1) the Polletts Cove and Blair River system in northern Cape Breton, covered over eight AC CDC botanist field days; and 2) the lower, non-tidal 29 km and selected tidal portions of the LaHave River in Lunenburg County, covered over 12 AC CDC botanist field days.

The Cape Breton Highlands support a diverse array of provincially rare plants, many with Arctic or western affinity, on cliffs, river shores, and mature deciduous forests in the deep ravines (especially those with more calcareous bedrock and/or soil) and on the peatlands and barrens of the highland plateau. Recent AC CDC fieldwork on Lockhart Brook, Big Southwest Brook and the North Aspy River sites similar to the Polletts Cove and Blair River valley was very successful, documenting 477 records of 52 provincially rare plant species in only five days of fieldwork. The Polletts Cove River is known for essentially virgin ravine deciduous forest, and there are extensive cliffs visible on aerial photography of the upper Blair River. In 2009 and 2008, hikers documented the first Nova Scotia record of the Arctic species Nodding Saxifrage (*Saxifraga cernua*) from cliffs along the Blair River, and the second extant Nova Scotia location of the extremely threatened calciphile Maidenhair Fern (*Adiantum pedatum*) from floodplain hardwood forest in the upper Polletts Cove valley, demonstrating the area's high potential for supporting other very rare flora. Database records suggest the only previous botanist to collect plant data on the Polletts Cove River was E.C. Smith on a single day in 1950. He likely covered only a limited area near the mouth of the river, but did document six provincially rare species. We undertook more comprehensive fieldwork on the Polletts Cove and Blair Rivers because of its potential for high density and diversity of rare species.

The LaHave River is unique among the eastern shore rivers of Nova Scotia in combining a high diversity of Atlantic Coastal Plain and other southern flora, with a number of species typical of relatively rich (non-acidic) soils. Previous botanical fieldwork in the river valley had been limited to a few days within limited areas but records of several very rare species were known, including two species (Riverweed, *Podostemum ceratophyllum*, and Slender Panic-Grass, *Dichanthelium xanthophysum*) known nowhere else in Nova Scotia. The latter species and six of the other previously documented rare species are specialists of drier, open forest and barren habitats that are rare and threatened provincially. Brackish tidal species (including the *Special Concern* Eastern Lilaopsis, *Lilaopsis chinensis*) are also known to be fairly well represented on the tidal lower river. In addition to the known occurrences of rare species and the high potential for additional Atlantic Coastal Plain flora, the relatively rich soils of the river valley indicate potential for occurrence of other disjunct southern species otherwise absent from the predominantly acidic soils of southwest Nova Scotia, possibly including species not previously documented for Nova Scotia. The LaHave River valley is almost entirely private land, has experienced heavy human disturbance and has almost no existing protected areas. The identification and documentation of remaining lands with high biodiversity value undertaken through this project thus has especially high conservation value.

This project documented 1,095 vascular plant records of 438 species (386 native, 52 exotic) from the Polletts Cove – Blair River area and 2,916 vascular plant records of 616 species (483 native, 133 exotic) from the LaHave River, and precisely documented 1,132 locations of 87 provincially rare plant species and 42 locations of 15 rare animal species. Our findings include two new plant species for

Nova Scotia (the native sub-Arctic Altai Fescue [*Festuca altaica*] from a plateau barren near the Blair River, and the exotic Winged Euonymus [*Euonymus alatus*] from New Germany on the LaHave River), and 202 records of 18 extremely rare (S1 or S1S2 ranked) plant species. The project has significantly increased understanding of the provincial status and distribution of many species and of the natural heritage values of the areas visited. All project data has been digitized and permanently incorporated into the AC CDC database, where it will inform future conservation planning and land-use decisions.

METHODS

Fieldwork in the Polletts Cove and Blair Rivers area was carried out by AC CDC botanists Sean Blaney and David Mazerolle, accompanied by NS DNR habitat biologist Sean Basquill, on July 16 to 19, 2013. LaHave River fieldwork was carried out AC CDC botanists Sean Blaney (6 days) and David Mazerolle (3 days), and AC CDC contract botanist Alain Belliveau (3 days) from August 1 to 8, 2014. Maps of areas covered are given in Figures 1 to 4. Total AC CDC person hours devoted to the project amounted to about 41 7.5 hour work days for fieldwork and 16 7.5 hour days for data processing and reporting.

Fieldwork was entirely on foot in Cape Breton and combined canoeing (mostly to get between areas covered on foot) and on-foot coverage on the LaHave River. At all sites, we documented areas covered in the field using GPS units set to save position coordinates every 20 seconds. On the LaHave River, we walked at least one shore of the river over almost the entire 29 km between New Germany and Bridgewater and covered selected sites in the tidal portion downstream from Bridgewater. The Cape Breton fieldwork started at MacGregor Brook on the Cabot Trail highway in north-central Cape Breton Highlands National Park, crossing the upper Red River and a highland plateau before descending into the southern branch of the Polletts Cove River ravine and following the ravine to the Blair River. We also covered most of the lower 4 km of the Blair River as well as some ravine slope locations and an area of open highland plateau just inland from Polletts Cove.

We compiled a single vascular plant species list for the Polletts Cove – Blair River area and separate species lists for each day on the LaHave River, documenting locations for first sightings of non-rare species. Species' general abundance within the surveyed areas was described as: *rare* – present in small numbers at very few locations; *uncommon* – present at roughly four or five locations in small numbers or one or two locations in large numbers; *locally common* – present at several locations in larger numbers but not widespread; *fairly common* – widespread at the site but generally not in very large numbers; *common* – widespread at the site and present in large numbers. Provincially rare species (those species with provincial status ranks [S-ranks], of S1 to S3S4 and/or provincial General Status Ranks of At Risk, May Be At Risk or Sensitive)¹, we recorded locations by GPS (generally accurate to 10 m or less), along with information on population size and extent, habitat and associated

¹ S-ranks are defined in detail at www.natureserve.org/explorer/ranking.htm#globalstatus, with S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = Secure with some cause for long term concern, and S5 = Demonstrably secure. General Status Ranks are defined in detail at <http://www.gov.ns.ca/natr/wildlife/genstatus/background.asp>, with ranks of At Risk, May Be At Risk, Sensitive, Secure, Undetermined, Not Assessed, Exotic, Extirpated, Extinct, Accidental, Occurrence Not Verified.

species. Individuals or patches separated from others by at least 10 m were considered distinct locations and recorded separately.

Most rare species were also documented by voucher specimens that will be deposited at the E.C. Smith Herbarium at Acadia University, with duplicates (where collected) sent to the Nova Scotia Museum Herbarium in Halifax and the Agriculture and Agri-Food Canada Collection of Vascular Plants in Ottawa. All species' location data has been digitized and entered into the Atlantic Canada Conservation Data Centre database, where it will be permanently maintained.

In addition to vascular plant data, incidental observations of breeding birds were documented by Sean Blaney, with breeding evidence recorded using the methods of the Maritimes Breeding Bird Atlas (<http://www.mba-aom.ca/jsp/codes.jsp?lang=en&pg=breeding>). Locations were recorded for all provincially rare or designated bird species at risk, as well as for the first observation of each species at a survey site and for any subsequent observations at the survey site that increased a species' breeding evidence.

RESULTS

VASCULAR PLANT DIVERSITY

This project documented 1,095 vascular plant records of 438 species (386 native, 52 exotic) from the Polletts Cove – Blair River area and 2,913 vascular plant records of 616 species (483 native, 133 exotic) from the LaHave River. Appendix 1 lists all species recorded.

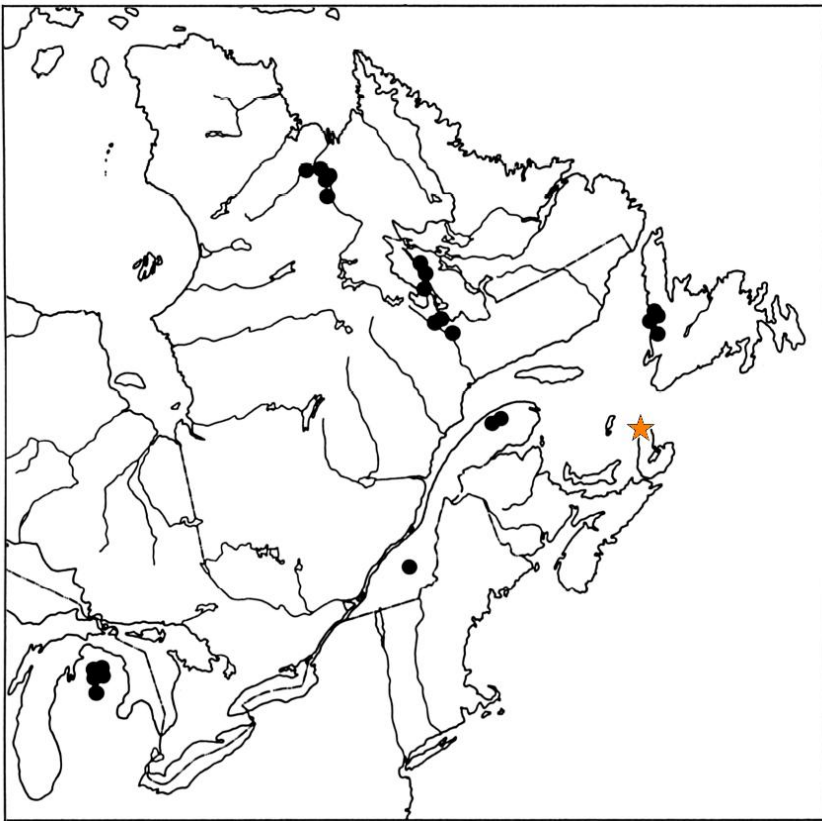
PROVINCIALY RARE VASCULAR PLANTS

Our fieldwork documented 1,130 locations of 87 provincially rare plant species; 360 location records of 53 provincially rare species from the Polletts Cove – Blair River area (Table 1) and 772 location records of 35 provincially rare species from the LaHave River (Table 2). Almost all of these records represent entirely new locations. We found two new species for Nova Scotia (the subarctic native species Altai Fescue, *Festuca altaica*, from Polletts Cove and the exotic shrub Winged Euonymus, *Euonymus alatus*, from the LaHave River at New Germany) and six species for which only one other Nova Scotia occurrence is known [Field Wormwood (*Artemisia campestris* ssp. *borealis*), Alpine Bistort (*Polygonum viviparum*), Purple Mountain Saxifrage (*Saxifraga oppositifolia*), Spiked Woodrush (*Luzula spicata*), Meadow Barley (*Hordeum brachyantherum*) and Slender Panic Grass (*Dichanthelium xanthophysum*)], along with many other significant records. Some of the most significant rare species documented are described in more detail below.

Most Significant Vascular Plants - Polletts Cove and Blair Rivers

Altai Fescue (*Festuca altaica*, S1 - May Be At Risk; Figure 5)

First record for Nova Scotia and the Maritimes; a species predominantly of northern and western North America and northeastern Asia, with records also known from higher elevations in the Gaspé Peninsula and Eastern Townships of Quebec, western Newfoundland and western Labrador (mapped below). Identification verified by Dr. Stephen Darbyshire, Agriculture and Agri-Food Canada, Ottawa. A few small patches of the species were present on a tundra-like plateau barren inland from Polletts Cove and north of the Blair River. The species' persistence at the site is potentially tenuous if climate change were to increase the extent of tree and tall shrub growth.



Distribution of *Festuca altaica* in eastern North America.

Map courtesy of Stephen Darbyshire, Agriculture & Agrifood Canada.

Meadow Barley (*Hordeum brachyantherum*, S1 - May Be At Risk; Figure 6)

Second Nova Scotia record. A northern and western species known from one other site in Nova Scotia (Northeast Margaree River) where it was in disturbed habitat and initially considered potentially introduced. The occurrence we found in river cobble in a remote site, with other northern disjuncts, well upstream on the Blair River was undoubtedly native, and suggests that the Northeast Margaree record likely originated from a native population in that area.

Spiked Woodrush (*Luzula spicata*, S1 - May Be At Risk; Figure 7)

Second Nova Scotia record. This arctic species was common on open, tundra-like plateau barrens and cliff ledges along the Blair River and inland from Polletts Cove. The only other Nova Scotia record was from the Cheticamp area in similar habitat. No other Maritimes occurrences are known.

Alpine Bistort (*Polygonum viviparum*, S1 - May Be At Risk; Figure 8)

Second Nova Scotia record. A widespread arctic species otherwise known in Nova Scotia only from Scatarie Island. Just 11 stems were observed, restricted to about 1m², in tundra-like open plateau barren inland from Polletts Cove. The species' persistence at this site seems potentially very tenuous due to the small population size.

Purple Mountain Saxifrage (*Saxifraga oppositifolia*, S1 - May Be At Risk; Figure 9)

Second Nova Scotia record. A widespread arctic species (and the territorial wildflower of Nunavut), otherwise known in Nova Scotia and the Maritimes only from a single site on Corney Brook in Cape Breton Highlands National Park. We found one site on a shaded cliff ledge upslope from the Blair River.

Field Wormwood (*Artemisia campestris* var. *borealis*, S1 - May Be At Risk; Figure 10)

Second location for Nova Scotia. A widespread northern species otherwise known in Nova Scotia only from cliffs on Lockhart Brook about 12 km northeast of the sites we documented from cliffs along the Blair River. The varietal identification was based on Roland and Smith (1969) and should be considered tentative given recent investigations by Arthur Haines in Maine (pers. comm.).

Nodding Fescue (*Festuca subverticillata*, S1 - May Be At Risk; Figure 11)

First Cape Breton record. An eastern hardwood forest species otherwise known from Nova Scotia only from a few rich hardwood sites about 300 km southwest near Economy, Blomidon and (historically) Five Mile River; also quite rare in New Brunswick. The species was remarkably abundant (72 records documented) in rich hardwood floodplain and richer hardwood upland forest on and near the Polletts Cove and Blair Rivers.

Common Bedstraw (*Galium aparine*, S2S3 - Sensitive; Figure 12)

First record for northern Cape Breton. Only recently clearly understood to be a native species in Nova Scotia. There are native and exotic forms of the species in North America and probably in Nova Scotia. The few occurrences in rich hardwood forest (e.g. at Blomidon, Kings County and the sizable ones found by this project along the Blair River) are almost certainly native, and this native form is clearly provincially rare.

Laurentian Bladder Fern (*Cystopteris laurentiana*, S1 - May Be At Risk; Figure 13)

A poorly understood species in Nova Scotia, derived from hybridization of Bulblet Bladder Fern (*C. bulbifera*) and a Fragile Fern species (*C. fragilis* or *C. tenuis*). The species seems to be local but perhaps fairly widespread on shaded rock ledges and cliffs in the ravines of northern Cape Breton. We found three sites in the upper Polletts Cove River.

Field Locoweed (*Oxytropis campestris* var. *johannensis*, S1 - May Be At Risk; Figure 14)

A widespread northern species, known in Nova Scotia only from a few cliff sites in Cape Breton and at Cape d'Or in Cumberland County. We found the species at one site on cliff ledges upslope from the Blair River.

Northern Meadowsweet (*Spiraea septentrionalis*, S1? – May Be At Risk; Figure 15)

This globally rare taxon is very closely related to, and perhaps only a variety or an environmentally induced form of the abundant and widespread White Meadowsweet (*Spiraea alba* var. *latifolia*). There has been no recent published work to determine its taxonomic status more definitely and we are considering it a separate species for the time being. We found one occurrence that appears to be the species on the highland plateau at the upper Red River, just north of Cape Breton Highlands National Park, and five locations of questionably identified specimens on the open plateaus near the Blair River. It is otherwise known in Nova Scotia only from Twin Island Lake and South Mountain in Cape Breton Highlands National Park.

Most Significant Vascular Plants - LaHave River

Parlin's Pussytoes (*Antennaria parlinii*, S1 - May Be At Risk; Figure 16)

This species of eastern North America just extends into Nova Scotia. It tends to occur in dryish, semi-open forest and forest margins and is known from a handful of central mainland Nova Scotia sites. An historic occurrence was known from Bridgewater and we located two nearby locations on the sandy banks of Weagle Island at Dayspring, downstream from Bridgewater. We found a second site after the project on Keddy Cove of Molega Lake, 27 km inland from the first.

Small-spike False-nettle (*Boehmeria cylindrica*, S1 - May Be At Risk; Figure 17)

This southern nettle species was only recently discovered in Nova Scotia on the Annapolis River and subsequently at the Shubenacadie Wildlife Park. The latter record may represent an introduction. We found it to be remarkably abundant, and locally co-dominant over fairly sizable areas of floodplain Red Maple forest, thicket and marsh. The species was present discontinuously from New Germany to Bridgewater and our observations vastly increase the known provincial population.

Sweet Wood Reed Grass (*Cinna arundinacea*, S1 - May Be At Risk; Figure 18)

This relatively southern grass of rich floodplain soils had been overlooked in Nova Scotia until 2001 and is otherwise known from the province only on River Inhabitants in southern Cape Breton, and the Stewiacke and Cornwallis Rivers in mainland Nova Scotia. We were surprised to find it widely scattered and locally abundant (34 records) in floodplain forest and thickets along the LaHave River, with records spread over almost the whole 29 km covered between New Germany and Bridgewater.

Slender Panic Grass (*Dichanthelium xanthophysum*, S1 - May Be At Risk; Figure 19)

This grass of open, dryish forest and forest margins extends sparsely into the Maritimes from the south and west, reaching a few river shore sites in central New Brunswick, and the LaHave River in Nova Scotia. It was recorded from "Bridgewater" in 1900 by botanist John Macoun, and the single extant site in Nova Scotia was discovered in 2000 by Sean Blaney in sandy pine – oak forest along the old railway

northwest of Bruhms Lake near West Northfield. We re-visited the site and defined its numbers and extent of occurrence more precisely. About 200 clumps occurred over about 150 m of the margins of the rail trail and the driveway to a cabin. We did not find it anywhere else on the river, demonstrating its extreme rarity in the area. Persistence of the species is rather tenuous due to the potential for disturbance or for closing in of forest cover.

American Cancer-root (*Conopholis americana*, S1S2 - May Be At Risk; Figure 20)

A parasite of oak roots, known prior to this survey in Nova Scotia from the Annapolis Valley, Kejimikujik National Park and a 1900 collection from “Bridgewater”. We relocated it in very local abundance on mature oak slopes of the LaHave River in Bridgewater, but did not find it anywhere else along the river. The site may have been known to local naturalists in Bridgewater as it is well within the town limits and quite near to the rail trail.

Wild Celery or American Eelgrass (*Vallisneria spiralis*, S2 – May Be At Risk; Figure 21)

This aquatic submergent species is known in Nova Scotia from five sites on the northern mainland, one on Cape Breton Island near Sydney and one other recently discovered site in southwestern Nova Scotia, at Carrigan Lake in Queens County. We found it to be abundant in shallow water all along the eastern side of Wentzells Lake.

OTHER CONTRIBUTIONS TO PROVINCIAL PLANT BIOGEOGRAPHICAL KNOWLEDGE

The project’s many records of interest in addition to the rare species noted above are not detailed extensively in this report, but the project did demonstrate the unusual ecology of the LaHave River compared to other rivers in southwestern Nova Scotia. The LaHave River has richer floodplain soils than any other river on the southern Atlantic shore of Nova Scotia and it supported a small suite of species that are widespread in northern Nova Scotia but very rare on the Atlantic side of the province, especially southward. In the relatively rich deciduous forest floodplains and valley slopes of the LaHave we found eight such species (listed below) that appear to be new records for Lunenburg County, based on lack of records in the AC CDC database and in the maps and text in the Roland and Smith (1969) and Zinck (1998) editions of the *Flora of Nova Scotia*.

Bromelike Sedge	<i>Carex bromoides</i>
Long-stalked Sedge	<i>Carex pedunculata</i>
Eastern Star Sedge	<i>Carex radiata</i>
White Avens	<i>Geum canadense</i>
Rough Avens	<i>Geum laciniatum</i>
Climbing False Buckwheat	<i>Polygonum scandens</i>
Maryland Sanicle	<i>Sanicula marilandica</i>
Round-leaved Dogwood	<i>Cornus rugosa</i>

Another noteworthy feature of the LaHave River flora is the abundance of Silky Willow (*Salix sericea* – S2, Sensitive) and Wavy-leaved Aster (*Symphotrichum undulatum*, S2 - Sensitive), which are otherwise rare to very rare in Nova Scotia. The LaHave River valley supports the great majority of the provincial populations of both these species.

Wavy-leaved Aster (Figure 22) is a disjunct southern species restricted in Canada to a small area of south-central Nova Scotia between Avonport and northern Queens County (with one unconfirmed report in Shelburne County). In most of this small range it is rare to uncommon, but in the lower LaHave River valley it is quite widespread (87 locations documented in this project) on dryish shoreline outcrops and valley slopes, forest edges and roadsides.

Silky Willow (Figure 23) is restricted in the province to the LaHave, a few records in the Tusket – Carleton River system (where it is locally fairly common on Lake Fanning) and a handful of other isolated occurrences. On the LaHave it occurred from 4 km south of New Germany downstream to Bridgewater (115 occurrences documented in this project) and was frequently abundant on rocky shores and floodplain meadows.

NOTABLE HABITATS AND ECOLOGICAL COMMUNITIES

The summaries below provide a brief overview of some of the more unusual habitats and ecological communities we noted during project fieldwork. Nova Scotia Department of Natural Resources Provincial Habitat Biologist Sean Basquill recorded more detailed descriptions of the Cape Breton communities mentioned.

Polletts Cove and Blair Rivers

Plateau barren

The extensive open plateau with dwarfed shrub heath (essentially low shrub tundra; Figures 24 & 25) on the highlands between the Blair River and the open ocean is undoubtedly one of the most impressive examples of its type in Nova Scotia. The site appears to have remained untreed because of severe climatic conditions and limited soil depth, with no evidence of fire (which tends to reduce diversity of rare northern plant species when it is a factor in other Cape Breton Highlands barrens) having played a significant role. The site's flora is relatively diverse and includes a number of Arctic species extremely rare in Nova Scotia, the most significant of which are Altai Fescue (*Festuca altaica*, S1 – May Be At Risk, new for Nova Scotia), Spiked Woodrush (*Luzula spicata*, S1 – May Be At Risk, second Nova Scotia record), and Alpine Bistort (*Polygonum viviparum*, S1 – May Be At Risk, second Nova Scotia record).

Open cliff and talus

Because of difficult access and limited time, we were only able to sample a small area of these habitats in the Blair River valley, around the uppermost portion of the valley we covered (Figures 26 & 27). The talus and open cliffs and ledges that we visited included one of the most diverse assemblages of rare northern species (listed below) known in Nova Scotia, and provided strong indication that further fieldwork is warranted along the Blair River and in other surrounding ravines with little history of botanical survey.

Rare Northern Species of Blair River Cliff and Talus

Field Wormwood (*Artemisia campestris* ssp. *borealis*, S1 - May Be At Risk)
Meadow Barley (*Hordeum brachyantherum*, S1 - May Be At Risk)
Spiked Woodrush (*Luzula spicata*, S1 - May Be At Risk)
Field Locoweed (*Oxytropis campestris* var. *johannensis*, S1 - May Be At Risk)
Purple Mountain Saxifrage (*Saxifraga oppositifolia*, S1 - May Be At Risk)
Western Hairy Rockcress (*Arabis hirsuta* var. *pyncocarpa*, S1S2 - May Be At Risk)
Multi-Rayed Goldenrod (*Solidago multiradiata*, S2 – May Be At Risk)
Green Spleenwort (*Asplenium trichomanes-ramosum*, S2 - Sensitive)
Scirpuslike Sedge (*Carex scirpoidea*, S2 - Sensitive)
Rock Whitlow-Grass (*Draba arabisans*, S2 - Sensitive)
Smooth Cliff Fern (*Woodsia glabella*, S2 - Sensitive)
Maidenhair Spleenwort (*Asplenium trichomanes*, S3 - Secure)

Calcareous hardwood forest

The valley of the Polletts Cove and Blair Rivers supports extensive mature and old growth Sugar Maple – Yellow Birch forest, with the valley floor supporting a flora suggesting especially basic soils (Figures 28 & 29). Most of the valley hardwood forest has an understory heavily dominated by ferns (Intermediate Wood-Fern - *Dryopteris intermedia*, Mountain Wood-Fern (*Dryopteris campyloptera*), New York Fern - *Thelypteris noveboracensis*, Lady Fern - *Athyrium filix-femina* ssp. *angustum*, Northern Beech Fern - *Phegopteris connectilis*), with Ostrich Fern (*Matteuccia struthiopteris*), and Silvery Spleenwort (*Deparia acrostichoides*) dominant in the richest sites. A large suite of provincially uncommon and rare species occurs in the richer floodplains and more locally in especially rich sites upslope. Nodding Fescue (*Festuca subverticillata*, S1 – May Be At Risk), Meadow Horsetail (*Equisetum pratense*, S2 - Sensitive), Pink Pyrola (*Pyrola asarifolia*, S3 - Secure), are extensively present on mesic floodplain terraces throughout the valley area we covered and Common Bedstraw (*Galium aparine*) is fairly common in these habitats along the Blair River. Hornemann's Willowherb (*Epilobium hornemannii*, S3 – Secure), Small-flowered Woodrush (*Luzula parviflora*, S3S4 - Secure), Thyme-Leaved Speedwell (*Veronica serpyllifolia* ssp. *humifusa*, S2S3 - Sensitive) and Squashberry (*Viburnum edule*) are fairly frequent in seepy moist spots, primarily near the river shores. Three species known to be fairly frequent in other richer northern Cape Breton hardwood forest, Northern Wild Licorice (*Galium kamtschaticum*, S3 - Secure), Long-bracted Frog Orchid (*Coeloglossum viride* var. *virescens*, S2S3 – May Be At Risk), and Menzies' Rattlesnake-plantain (*Goodyera oblongifolia*, S3 - Sensitive) were primarily or exclusively found in the uppermost parts of the Polletts Cove ravine, with no obvious explanation for apparent absence downstream.

Over the long-term, if moose populations remain very high, the valley hardwood forests, especially those on relatively level ground on the valley floor where browsing is most intense, seem likely to change into more open habitats because heavy moose browsing has eliminated most tree regeneration that would replace mature trees as they fall. Future opening of the canopy may reduce understory diversity and rare forest species' populations as tall and highly competitive light-demanding species become more dominant.

Calcareous sloped seepage fen

Fens around the margins of the extensive Cape Breton Highland plateau peatlands are frequently enriched by groundwater seepage coming off the adjacent domed bogs, resulting in a more diverse flora and occurrence of some uncommon species. We found one especially good example of this where we crossed the upper Red River on our way into the Polletts Cove River valley from the Cabot Trail (Figure 30). At this site, an enriched graminoid fen (variously dominated by Coast Sedge - *Carex exilis*, Slender Sedge - *Carex lasiocarpa* var. *americana*, Water Sedge - *Carex aquatilis*, and Bear Sedge - *Carex utriculata* has developed on the shallow valley slope of the river (which is just a small stream at that point). Other graminoids indicative of basic soils included Slender Cottongrass - *Eriophorum gracile*, Green-keeled Cottongrass - *Eriophorum viridicarinatum*, Spiked Muhly - *Muhlenbergia glomerata*, Alpine Clubrush - *Trichophorum alpinum*. The area has a high diversity of herbs including several indicative of more basic soils (Swamp Thistle – *Cirsium muticum*, Golden Ragwort – *Packera aurea*, Water Avens – *Geum rivale*, Canada Burnet – *Sanguisorba canadensis*, Purple-stemmed Angelica – *Angelica atropurpurea*, White Bog Orchid – *Platanthera dilatata*).

LaHave River

Open, dry Red Oak – pine forest

Historic records from the Bridgewater area of rare species associated with open oak forest were one of the factors initially attracting our attention to the LaHave River. The impacts of land clearance, agriculture and probably also suppression of fire have made good examples of these forest types rare in the LaHave valley. We found only remnant patches of open Red Oak-dominated forest on valley slopes (Figure 31), with several examples having been impacted by past cattle grazing. We managed to find some of the the historically recorded oak forest species (American Cancer-Root – *Conopholis americana*, S1S2 – May Be At Risk; Slender Panic Grass – *Dichanthelium xanthophyllum*, S1 – May Be At Risk), but only in single sites, with the panic grass only maintaining itself within a relatively closed-canopy pine-oak forest along artificial openings created by the old railroad and adjacent trails. The relatively open forest communities these species require were likely maintained in historic times at least in part through intentional low-intensity fires set by the Mi'kmaq to improve hunting conditions.

Atlantic Coastal Plain lakeshore

The shoreline of Wentzells Lake is mostly fairly broad and shallowly sloped gravel and sand (Figure 32), and it supports a good diversity of Atlantic Coastal Plain flora typical of southwestern Nova Scotia [*i.e.* the coastal plain variety of Switch Grass (*Panicum virgatum* var. *spissum*), Carolina Grass-leaved Goldenrod (*Euthamia caroliniana*), Toothed Nutsedge (*Cyperus dentatus*), Deer-tongue Panic-Grass (*Dichanthelium clandestinum*, S3 – Secure, and Eaton's Panic-Grass (*Dichanthelium spretum*)], all of which are common, and Bog Yellow-Eyed-Grass (*Xyris difformis*), Atlantic Blue Eyed Grass (*Sisyrinchium atlanticum*, S3 – Secure) and Comb-leaved Mermaid-weed (*Prosperpinaca pectinata*, S3 – Secure), which are rarer]. The lake represents one of the more northern occurrences of a diverse Atlantic Coastal Plain shoreline community in Nova Scotia.

Open river shorelines and marshes

High diversity open shoreline meadow communities maintained by seasonal flooding occur in bands along the shore in many places along the river. In most areas, the shoreline zone is quite narrow (Figure 33), but in some areas broader open shoreline communities have developed on gravel bars and islands (Figure 34) or rock outcrops (Figures 35 and 36). Shoreline plant communities vary greatly but Tall Cordgrass (*Spartina pectinata*), Canada Bluejoint (*Calamagrostis canadensis*) and Royal Fern (*Osmunda regalis* var. *spectabilis*) are among the most frequently dominant species, and many communities exhibit a distinct southern influence, as indicated by the following species: False Water-Pepper (*Polygonum hydropiperoides*; frequently forms dense patches at or just below the waterline); Deer-tongue Panic-Grass (*Dichanthelium clandestinum*, S3 – Secure; abundant from the tidal zone upstream almost to New Germany); Tradescant's Aster (*Symphotrichum tradescantii*; abundant on shores over most of the non-tidal area we covered); Swamp Milkweed (*Asclepias incarnata*; abundant almost throughout the non-tidal river surveyed); False Nettle (*Boehmeria cylindrica*, S1 – May Be At Risk); the southern variety of Water Smartweed (*Polygonum amphibium* var. *emersum*); Blue Vervain (*Verbena hastata*, S3 – Secure); Golden Pert (*Gratiola aurea*); Narrow-leaved Blue-Eyed-Grass (*Sisyrinchium angustifolium*); Tubercled Orchid (*Platanthera flava* – most or all the southern var. *flava*; S2 – Sensitive).

Extensive open marshes occur in the floodplain north of Wentzells Lake and near Bruhms Lake, (Figure 37) with smaller examples elsewhere in the floodplain. Canada Bluejoint (*Calamagrostis canadensis*) is frequently heavily dominant, with some of the same southern species mentioned above being locally present. The abundance in LaHave marshes of Swamp Milkweed and Silky Willow (*Salix sericea*, S2 – Sensitive), is unusual in floodplain marsh communities elsewhere in Nova Scotia, as is the frequent presence of the southern variety of Water Smartweed (*Polygonum amphibium* var. *emersum*).

Floodplain forests

The lower, more frequently inundated floodplain forests of the LaHave River are heavily dominated by Red Maple (Figure 38), often with seasonal channels forming backwater sloughs that are isolated from the main river when water levels lower. These lower floodplains are the habitat most frequently occupied by Tall Woodreed (*Cinna arundinacea*, S1 – May Be At Risk), which was remarkably common on the LaHave for a species known from only three other Nova Scotia rivers. The rare Hop Sedge (*Carex lupulina*, S3 – Sensitive) was also occasionally present around the backwater sloughs. Slightly elevated but still fairly frequently flooded floodplain terraces support a flora that is indicative of richer soils, with Ostrich Fern (*Matteuccia struthiopteris*) often dominant, Sugar Maple very locally present, and a suite of herbaceous species otherwise uncommon in south Nova Scotia sometimes occurring (*i.e.* those listed on page 9, plus Zig-zag Goldenrod – *Solidago flexicaulis*, Hooked and Small-flowered Buttercups – *Ranunculus recurvatus* and *R. abortivus*), Sessile-leaved Bellwort (*Uvularia sessilifolia*), Hog Peanut (*Amphicarpaea bracteata*) and Hooked Agrimony (*Agrimonia gryposepala*), among others.

Slightly higher elevation floodplain terraces support a greater diversity of tree species, with Eastern Hemlock frequently dominant and Red Oak sometimes common. We documented a few mature and old growth examples of Eastern Hemlock forest with a particularly high quality, though small, example present on the west side of the river north of the West LaHave River mouth (Figure 39).

Brackish tidal marsh

The LaHave River has a long tidal zone extending downstream from Bridgewater with shoreline brackish marsh communities supporting extremely large populations of two rare, southern species – Eastern *Lilaeopsis* (*Lilaeopsis chinense*, nationally Special Concern, S2 – Sensitive) and Seaside Brookweed (*Samolus valerandi* ssp. *parviflorus*, S3 – Sensitive) (Figure 40). Toward the downstream end of the estuary Gaspe Arrowgrass (*Triglochin gaspense*, S3? – Undetermined) becomes relatively common in gravelly sparsely vegetated shoreline saltmarshes. Throughout the brackish tidal zone, Canada Germander (*Teucrium canadense*, S3 – Secure) is locally abundant in the upper margin of saltmarshes near the transition into non-saline habitats.

BREEDING BIRDS AND OTHER ANIMALS

We documented 45 records of 41 breeding birds in the Polletts Cove – Blair River area and 100 records of 39 breeding bird species along the LaHave River. In the Polletts Cove area we documented nine records of nine species of conservation concern, including one record of Bank Swallows (S3B, COSEWIC Threatened) around suitable nesting cliffs at the mouth of the Polletts Cove River. On the LaHave River we documented 31 records of five species of conservation concern including three records of Common Nighthawk (S3B, COSEWIC Threatened, SARA Threatened), three records of Barn Swallow (S3B, COSEWIC Threatened), and 16 records of Eastern Wood-Pewee (S3S4B, COSEWIC Threatened, SARA Threatened). Breeding bird data is summarized in Appendix 2.

We also documented single records on the LaHave River of Snapping Turtle (*Chelydra serpentina*) and American Eel (*Anguilla rostrata*), both of which are COSEWIC Special Concern species, and three butterfly records that will be submitted to the Maritimes Butterfly Atlas.

CONCLUSIONS

The project was highly successful in extensively documenting the botanical diversity of both areas we covered. All of the project's species location data has been incorporated into the AC CDC's GIS-linked database, where it will be permanently available to inform conservation and land use decisions in or near our study areas.

We were especially successful in recording a high diversity of very rare vascular plants in the Polletts Cove – Blair River area, documenting it as one of the most important areas for relict Arctic species in Nova Scotia, and discovering several rich hardwood forest species not previously known in Cape Breton generally or in northernmost Cape Breton. The extremely rugged nature of the terrain limited the area we could cover in our four day trip, meaning that extensive additional areas with high potential for rare species, likely including more new species for Nova Scotia, remain in the Blair River valley. Our success in the Polletts Cove and Blair River areas also suggests further fieldwork would be highly productive in nearby ravine systems that have had little or no previous botanical fieldwork.

Our comprehensive coverage of the lower 29 km of the LaHave River above tidal influence produced a very thorough documentation of the vascular plant diversity of that area, and the species we found there demonstrate that the lower LaHave River supports an unusual assemblage of southern-affiliated species including species associated with both the acidic Atlantic Coastal Plain and the richer soils of the Eastern Deciduous Forest. Several of the species we found on the LaHave River have such limited distributions in Nova Scotia that this survey contributed a high proportion of total known provincial records thereby greatly increasing understanding of their provincial status. The scarcity of high quality examples of drier, open oak – pine forest and barren communities along the LaHave, and the project's absence of records of several historically collected species associated with these habitats suggests that they have experienced significant declines since 1900. Likewise, the absence of new records of Riverweed (*Podostemum ceratophyllum*, S1 – May Be At Risk) and Slender Panic-Grass (*Dichantheium xanthophysum*, S1 – May Be At Risk), despite targeted searches of their habitats, demonstrates that they are exceedingly rare even on the LaHave River and that confirmed locations are of a very high priority for conservation.

The project's rare species data has already contributed significantly to the revision of provincial status ranks for a number of species during vascular plant rank revisions completed in May 2014, and the ready availability of the data in the AC CDC database means that it will continue to contribute to provincial status rank revisions through the future.

Table 1. Provincially rare vascular plant species documented during 2013 surveys in and around the Polletts Cove and Blair Rivers, Cape Breton Island, Nova Scotia, with provincial status ranks (see Methods) and numbers of locations documented (defined as individuals or groups of individuals separated from others by >10m).

Species	Common Name	S-rank	General Status Rank	# Loc.	Comments
<i>Artemisia campestris ssp. borealis</i>	Field Wormwood	S1	May Be At Risk	2	2nd record for NS
<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern	S1	May Be At Risk	3	
<i>Festuca altaica</i>	Northern Rough Fescue	S1	May Be At Risk	3	1st records for NS
<i>Festuca subverticillata</i>	Nodding Fescue	S1	May Be At Risk	72	
<i>Hordeum brachyantherum</i>	Meadow Barley	S1	May Be At Risk	1	2nd record for NS
<i>Luzula spicata</i>	Spiked Woodrush	S1	May Be At Risk	8	2nd & 3rd records for NS
<i>Oxytropis campestris var. johannensis</i>	Field Locoweed	S1	May Be At Risk	1	
<i>Polygonum viviparum</i>	Alpine Bistort	S1	May Be At Risk	1	2nd record for NS
<i>Saxifraga oppositifolia</i>	Purple Mountain Saxifrage	S1	May Be At Risk	1	2nd record for NS
<i>Spiraea septentrionalis</i>	Northern Meadowsweet	S1?	May Be At Risk	1	5 additional records of questionable ID vs. <i>S. alba</i> var. <i>latifolia</i>
<i>Anemone virginiana var. alba</i>	Virginia Anemone	S1S2	Sensitive	1	
<i>Arabis hirsuta var. pycnocarpa</i>	Western Hairy Rockcress	S1S2	May Be At Risk	1	
<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort	S2	Sensitive	1	
<i>Betula borealis</i>	Northern Birch	S2	Sensitive	1	
<i>Carex capillaris</i>	Hairlike Sedge	S2	Sensitive	1	
<i>Carex scirpoidea</i>	Scirpuslike Sedge	S2	Sensitive	2	
<i>Draba arabisans</i>	Rock Whitlow-Grass	S2	Sensitive	2	
<i>Eriophorum gracile</i>	Slender Cottongrass	S2	Sensitive	1	
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather	S2	Sensitive	1	
<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely	S2	May Be At Risk	3	
<i>Saxifraga paniculata ssp. neogaea</i>	White Mountain Saxifrage	S2	Sensitive	1	
<i>Solidago multiradiata</i>	Multi-rayed Goldenrod	S2	May Be At Risk	1	
<i>Woodsia glabella</i>	Smooth Cliff Fern	S2	Sensitive	1	
<i>Betula pumila</i>	Bog Birch	S2S3	Sensitive	23	
<i>Botrychium lanceolatum var. angustisegmentum</i>	Lance-Leaf Grape-Fern	S2S3	Sensitive	1	
<i>Coeloglossum viride var. virescens</i>	Long-bracted Frog Orchid	S2S3	May Be At Risk	3	
<i>Galium aparine</i>	Common Bedstraw	S2S3	Sensitive	8	
<i>Juncus trifidus</i>	Highland Rush	S2S3	Sensitive	10	

Species	Common Name	S-rank	General Status Rank	# Loc.	Comments
<i>Plantago rugelii</i>	Rugel's Plantain	S2S3	Secure	2	
<i>Poa glauca</i>	Glaucous Blue Grass	S2S3	Sensitive	9	
<i>Shepherdia canadensis</i>	Soapberry	S2S3	Sensitive	1	
<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed	S2S3	Sensitive	1	
<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	Thyme-Leaved Speedwell	S2S3	Sensitive	8	
<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	S3	Secure	4	
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	S3	Secure	3	
<i>Campanula aparinoides</i>	Marsh Bellflower	S3	Sensitive	1	ID not confirmed; not collected
<i>Carex wiegandii</i>	Wiegand's Sedge	S3	Sensitive	16	
<i>Empetrum eamesii</i>	Pink Crowberry	S3	Sensitive	3	
<i>Epilobium hornemannii</i>	Hornemann's Willowherb	S3	Secure	20	
<i>Equisetum pratense</i>	Meadow Horsetail	S3	Sensitive	30	
<i>Galium kamtschaticum</i>	Northern Wild Licorice	S3	Secure	4	
<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	S3	Sensitive	3	
<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss	S3	Sensitive	1	
<i>Pyrola asarifolia</i>	Pink Pyrola	S3	Secure	40	
<i>Pyrola minor</i>	Lesser Pyrola	S3	Sensitive	4	
<i>Schizaea pusilla</i>	Little Curlygrass Fern	S3	Secure	1	
<i>Vaccinium boreale</i>	Northern Blueberry	S3	Sensitive	10	
<i>Viburnum edule</i>	Squashberry	S3	Sensitive	9	
<i>Carex foenea</i>	Fernald's Hay Sedge	S3?	Secure	4	
<i>Equisetum hyemale</i> var. <i>affine</i>	Common Scouring-rush	S3S4	Secure	10	
<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry	S3S4	Secure	1	
<i>Luzula parviflora</i>	Small-flowered Woodrush	S3S4	Secure	14	
<i>Trisetum spicatum</i>	Narrow False Oats	S3S4	Secure	4	
53 PROVINCIAL RARE SPP.	TOTAL # RARE SPP. RECORDS			360	

Table 2. Provincially rare vascular plant species documented during 2013 surveys along the LaHave River, Lunenburg County, Nova Scotia, with provincial status ranks (see Methods) and numbers of locations documented (defined as individuals or groups of individuals separated from others by >10m).

Species	Common Name	S-rank	General Status Rank	# Loc.	Comments
<i>Antennaria parlinii</i>	Parlin's Pussytoes	S1	May Be At Risk	2	
<i>Boehmeria cylindrica</i>	Small-spike False-nettle	S1	May Be At Risk	45	
<i>Cinna arundinacea</i>	Sweet Wood Reed Grass	S1	May Be At Risk	34	
<i>Dichanthelium xanthophyllum</i>	Slender Panic Grass	S1	May Be At Risk	6	
<i>Conopholis americana</i>	American Cancer-root	S1S2	May Be At Risk	8	
<i>Carex tenera</i>	Tender Sedge	S2	Sensitive	1	
<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	S2	Sensitive	42	
<i>Platanthera flava</i>	Southern Rein-Orchid	S2	Sensitive	30	Probably most or all var. <i>flava</i> (vs. var. <i>herbiola</i>)
<i>Salix sericea</i>	Silky Willow	S2	May Be At Risk	115	
<i>Symphotrichum undulatum</i>	Wavy-leaved Aster	S2	Sensitive	87	
<i>Vallisneria americana</i>	Wild Celery	S2	May Be At Risk	7	
<i>Ceratophyllum echinatum</i>	Prickly Hornwort	S2S3	Sensitive	2	
<i>Agalinis neoscotica</i>	Nova Scotia Agalinis	S3	Secure	3	
<i>Agrimonia gryposepala</i>	Hooked Agrimony	S3	Secure	8	
<i>Alnus serrulata</i>	Smooth Alder	S3	Sensitive	2	
<i>Carex lupulina</i>	Hop Sedge	S3	Secure	3	
<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass	S3	Secure	174	
<i>Equisetum variegatum</i>	Variiegated Horsetail	S3	Secure	1	
<i>Hieracium paniculatum</i>	Panicled Hawkweed	S3	Secure	7	
<i>Limosella australis</i>	Southern Mudwort	S3	Secure	1	
<i>Megalodonta beckii</i>	Water Beggarticks	S3	Secure	3	
<i>Polygonum scandens</i>	Climbing False Buckwheat	S3	Sensitive	3	
<i>Proserpinaca palustris</i>	Marsh Mermaidweed	S3	Secure	3	
<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed	S3	Secure	1	
<i>Samolus valerandi ssp. parviflorus</i>	Seaside Brookweed	S3	Sensitive	31	
<i>Teucrium canadense</i>	Canada Germander	S3	Sensitive	39	
<i>Vaccinium caespitosum</i>	Dwarf Bilberry	S3	Secure	26	
<i>Verbena hastata</i>	Blue Vervain	S3	Secure	29	
<i>Alnus serrulata x incana ssp. rugosa</i>	a hybrid Alder	S3 (x S5)	Sensitive (x Secure)	3	
<i>Amelanchier stolonifera</i>	Running Serviceberry	S3?	Secure	25	
<i>Asclepias incarnata ssp. pulchra</i>	Swamp Milkweed	S3?	5 Undetermined	2	

Species	Common Name	S-rank	General Status Rank	# Loc.	Comments
<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed (<i>emersum</i> variety)	S3?	5 Undetermined	17	
<i>Triglochin gaspensis</i>	Gaspé Arrowgrass	S3?	5 Undetermined	6	
<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass	S3S4	Secure	1	
<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet	S3S4	Secure	5	
35 PROVINCIALY RARE SPP.	# RARE SPP. RECORDS			772	

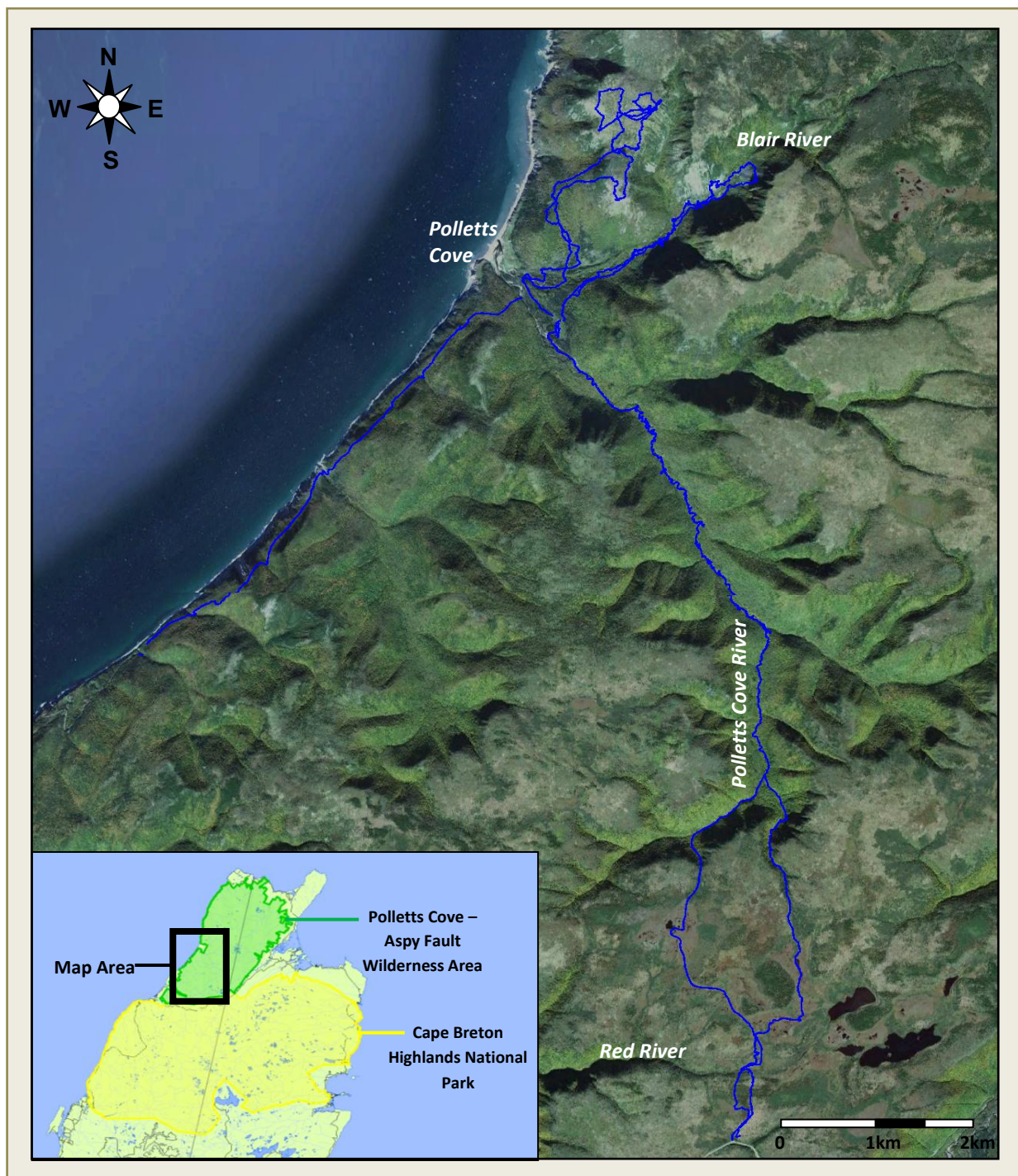


Figure 1. Map of GPS tracks recorded by David Mazerolle in and around the Polletts Cove and Blair Rivers, July 16-19, 2013. Sean Blaney’s GPS malfunctioned, so his track is recreated from SPOT satellite transmitter message points in the southern portion and unrecorded elsewhere (where it was in the same general area as the Mazerolle tracks mapped here).

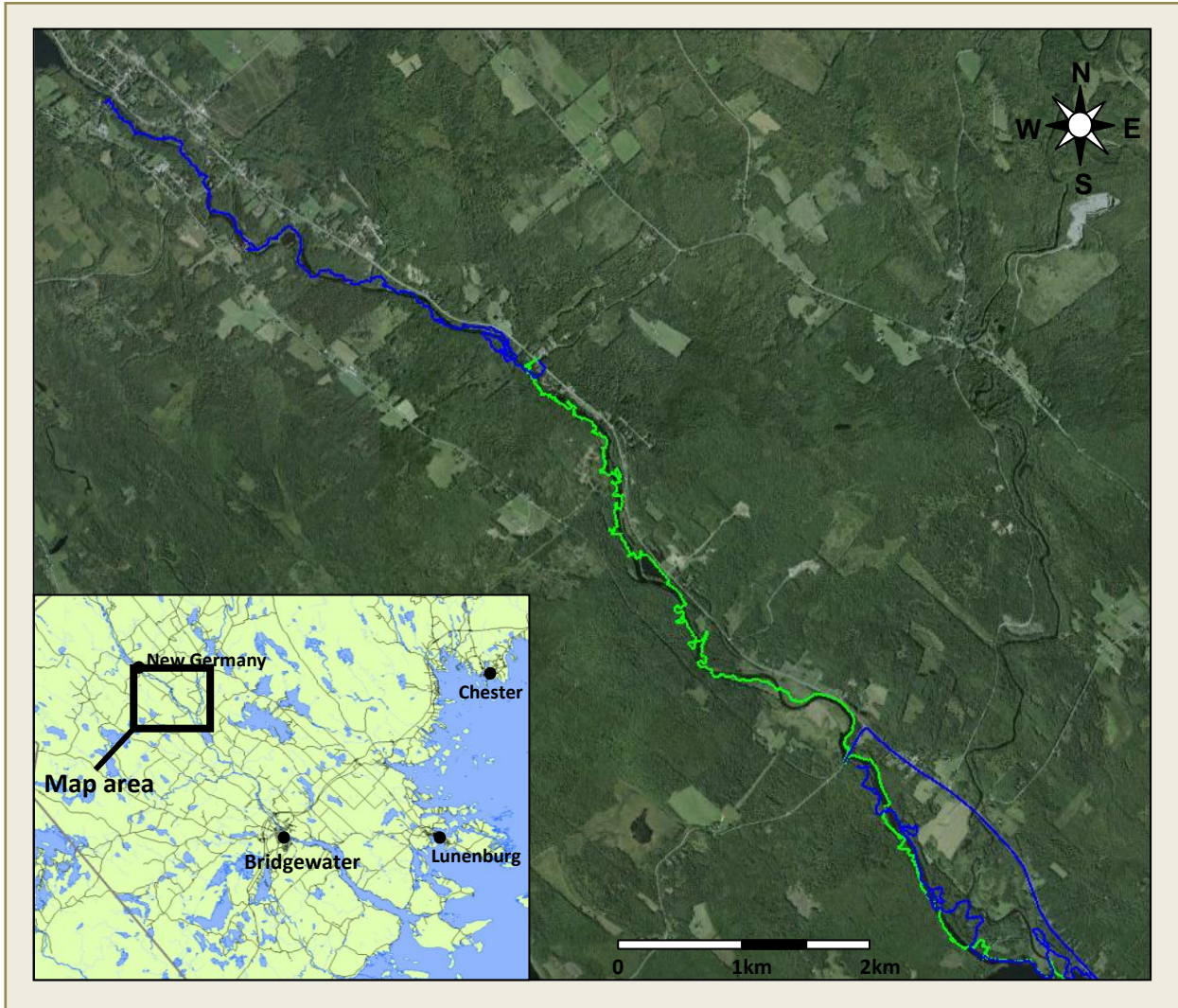


Figure 2. Survey coverage on the LaHave River from New Germany to the north end of Wentzells Lake. Colored lines represent track files logged by GPS units (blue = Sean Blaney track, green = David Mazerolle track). Aerial photos from Google Earth, accessed in May 2014.

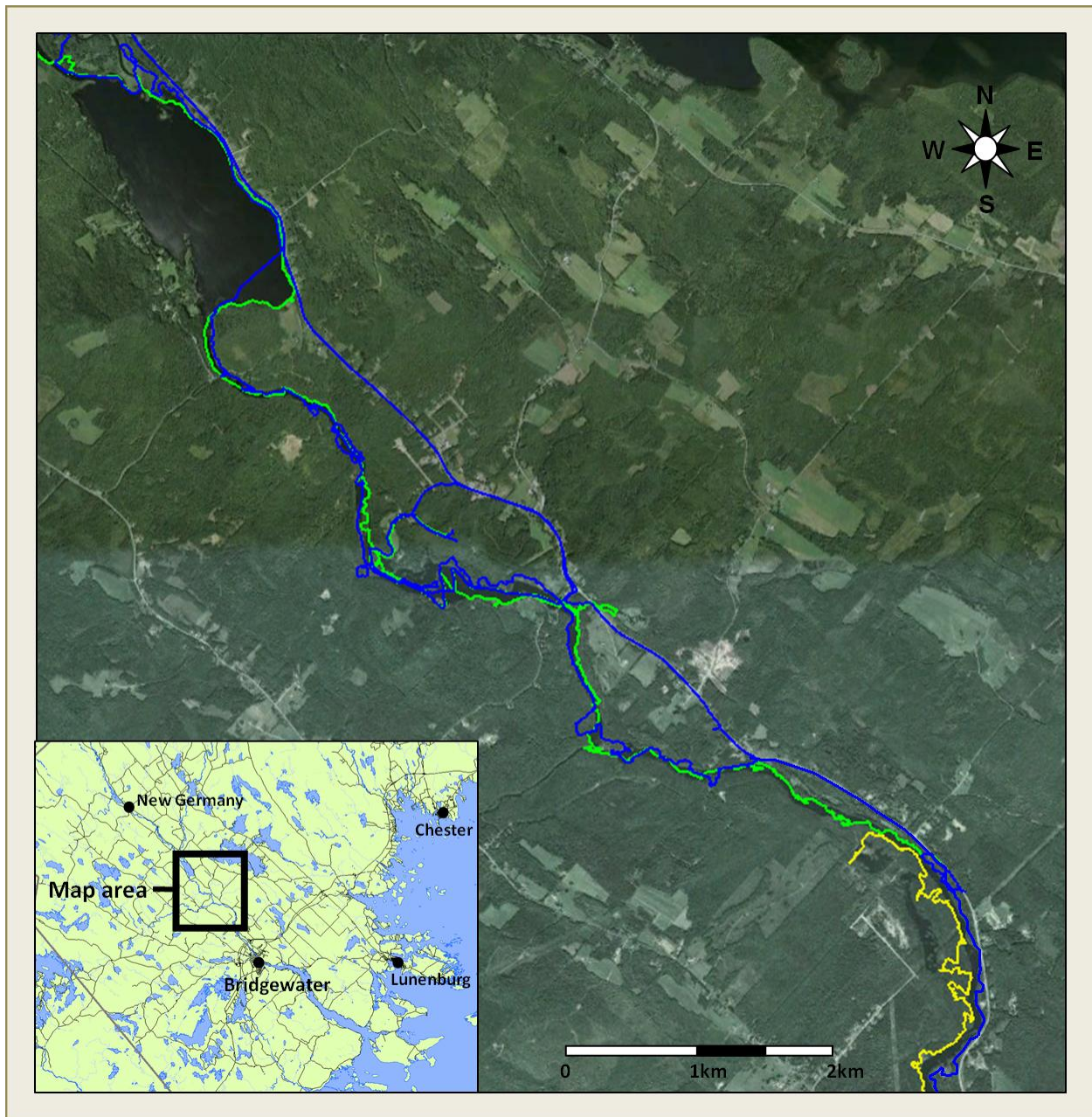


Figure 3. Survey coverage on the LaHave River from the north end of Wentzells Lake to Cookville. Colored lines represent tracks files logged by GPS units (blue = Sean Blaney track, green = David Mazerolle track, yellow = Alain Belliveau track). Aerial photos from Google Earth, accessed in May 2014.

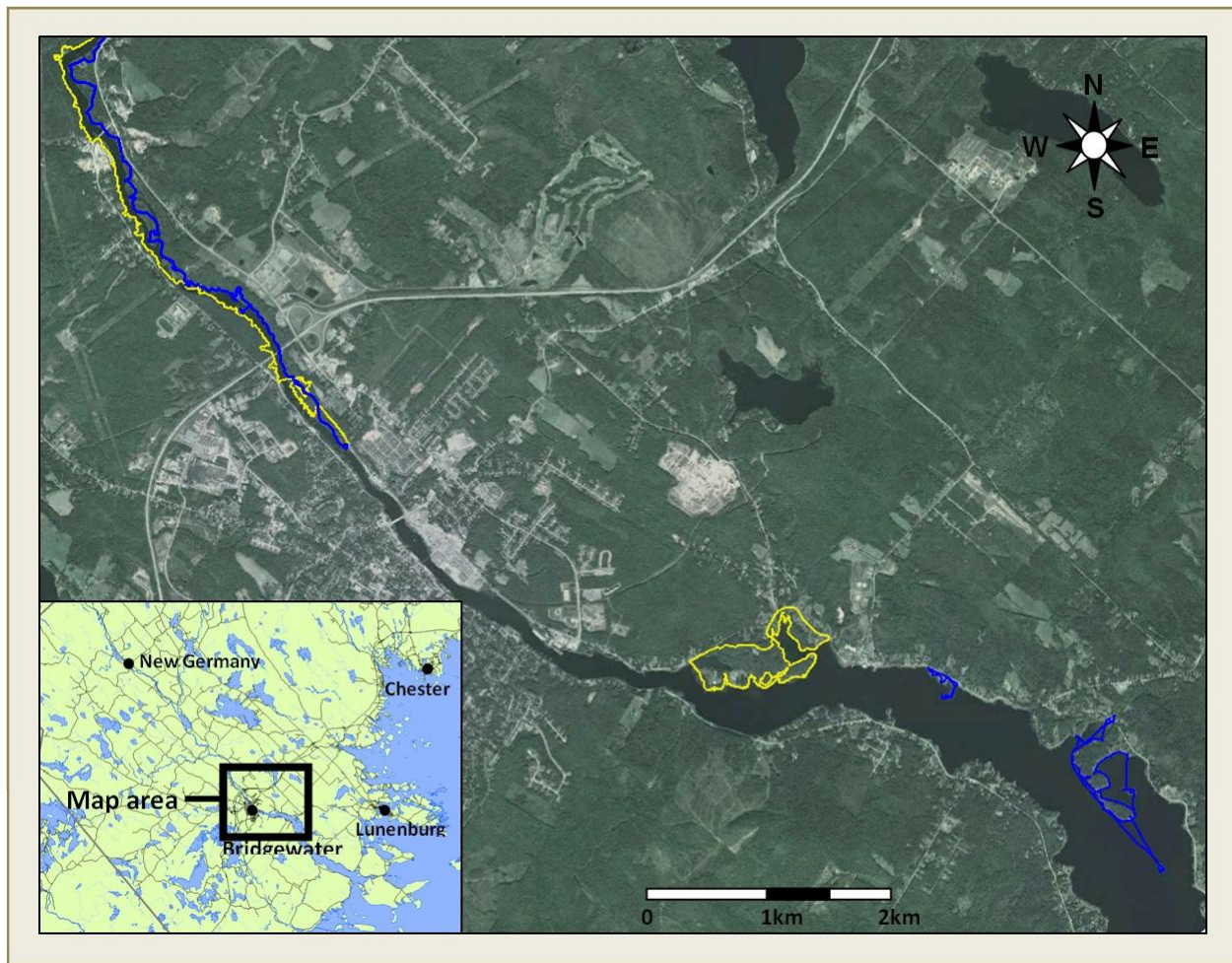


Figure 4. Survey coverage on the LaHave River from Cookville to Upper LaHave. Colored lines represent tracks files logged by GPS units (yellow = Alain Belliveau track, blue = Sean Blaney track). Aerial photos from Google Earth, accessed in May 2014.



Figure 5. Altai Fescue (*Festuca altaica*, S1 – May Be At Risk, first record for Nova Scotia) clump and inflorescence, from the highland plateau between the Blair River and the Gulf of St. Lawrence.



Figure 6. Meadow Barley (*Hordeum brachyantherum*, S1 – May Be At Risk, 2nd record for Nova Scotia) in talus along the Blair River. This record in a remote and natural habitat demonstrated that the species should be considered native in Nova Scotia.



Figure 7. Spiked Woodrush (*Luzula spicata*, S1 – May Be At Risk, 2nd Nova Scotia record) from a cliff ledge near the Blair River. The species was also locally common in nearby plateau low shrub barrens. The bluish-green grass behind the woodrush is Glaucous Blue Grass (*Poa glauca*, S2S3 – Sensitive).



Figure 8. Alpine Bistort (*Polygonum viviparum*, S1 – May Be At Risk, 2nd Nova Scotia record) in plateau low shrub barrens near the Blair River.



Figure 9. Purple Saxifrage (*Saxifraga oppositifolia*, S1 – May Be At Risk, 2nd Nova Scotia record) from a cliff ledge near the Blair River.



Figure 10. Common Wormwood (*Artemisia campestris*, S1 – May Be At Risk, 2nd Nova Scotia record) from a cliff ledge near the Blair River.



Figure 11. Nodding Fescue (*Festuca subverticillata*, S1 – May Be At Risk, 1st Cape Breton record) from the Polletts Cove River. It was common in rich hardwood forest in and around the Blair and Polletts Cove Rivers.



Figure 12. Common Bedstraw (*Galium aparine*, S2S3 – Sensitive, May Be At Risk, 1st native Cape Breton record) from the Blair River, where it was locally abundant in rich floodplain and valley slope hardwood forest.



Figure 13. Laurentian Bladder-Fern (*Cystopteris laurentiana*, S1 – May Be At Risk) from the upper Polletts Cove River.



Figure 14. Field Locoweed (*Oxytropis campestris* ssp. *johannensis*, S1 – May Be At Risk) from a cliff ledge near the Blair River.



Figure 15. Northern Meadowsweet (*Spiraea septentrionalis*, S1? – May Be At Risk) from the upper Red River, Cape Breton Highlands.



Figure 16. Parlin's Pussytoes (*Antennaria parlinii*, S2 – Sensitive) on a gravelly bank of Weagle Island on the tidal LaHave River. The inset photo in the top right shows the lateral veins on the leaf underside that identify the species.



Figure 17. False Nettle (*Boehmeria cylindrica*, S1 – May Be At Risk), co-dominant in marshy floodplain shrub swamp on the LaHave River. The shrub in the upper photo is Silky Willow (*Salix sericea*, S2 – Sensitive).



Figure 18. Tall Woodreed (*Cinna arundinacea*, S1 – May Be At Risk) in floodplain forest on the LaHave River.



Figure 19. Slender Panic-Grass (*Dichanthelium xanthophysum*, S1 – May Be At Risk) at the only known extant site for the species in Nova Scotia along the old railway bed between Wentzells Lake and Upper Northfield on the east side of the LaHave River. The upper picture shows the habitat (margins of the old railway bed and associated trails where semi-open conditions are artificially maintained in an otherwise closed-canopy pine – oak forest), and the tenuous nature of the population. Only about 200 clumps are present.



Figure 20. Mature seed capsules of American Cancer-root (*Conopholis americana*, S1S2 – May Be At Risk) from mature oak forest slope along the LaHave River within Bridgewater town limits.

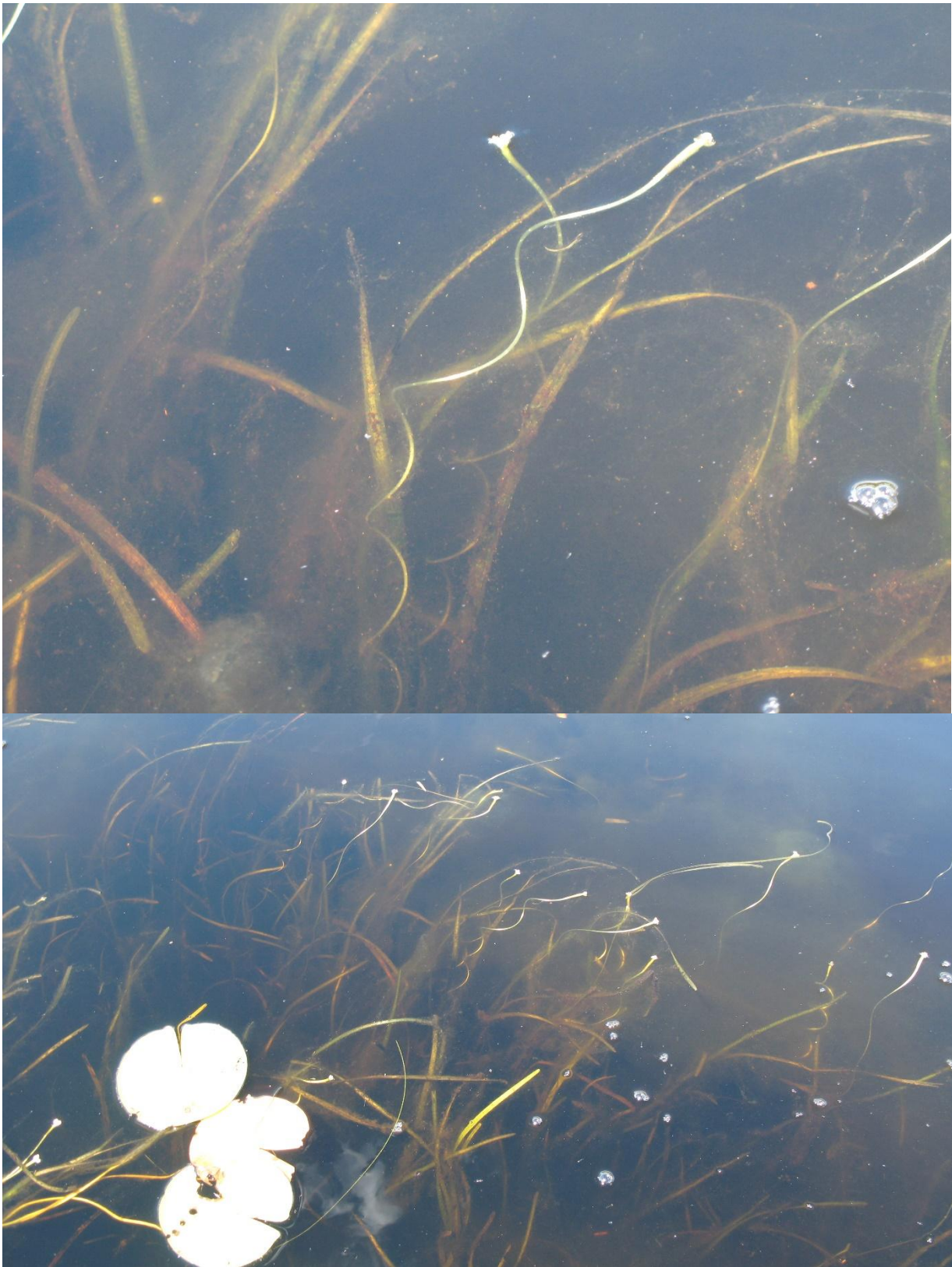


Figure 21. Wild Celery (*Vallisneria americana*, S2 – Sensitive) at Wentzells Lake, with White Water-Lily on the bottom left. The female flowering stems twist into spirals after fertilization to pull the maturing seeds underwater.



Figure 22. Wavy-Leaved Aster (*Symphyotrichum undulatum*, S2 – Sensitive), with inset photo showing distinctive broadly clasping petiole base. This species is restricted in Canada to a narrow very narrow zone in south-central Nova Scotia and is more common in the LaHave River valley than anywhere else in Canada.



Figure 23. Silky Willow (*Salix sericea*, S2 – Sensitive) from the LaHave River shoreline. The LaHave River supports the great majority of the known population of this species in Nova Scotia.



Figure 24. Two views of tundra-like low-shrub barren on the plateau between the Blair River and the Gulf of St. Lawrence, with Sean Blaney recording rare plant data (above).



Figure 25. Tundra-like low-shrub barren on the plateau between the Blair River and the Gulf of St. Lawrence, with David Mazerolle surveying for rare species (above) and (below) the plant community around the only occurrence found for Alpine Bistort (*Polygonum viviparum*, S1 – May Be At Risk, in centre foreground).



Figure 26. Talus and scree slopes with open cliffs along the Blair River, near the uppermost location we reached in our surveys. The cliff in the upper right of the upper photo supported the most diverse assemblage of Arctic-associated species.



Figure 27. Open cliff face (looking straight up from the cliff base) on the upper Blair River. This is the cliff in the upper right of Figure 26 that supported the highest diversity of Arctic-affiliated species. The dominant species in the lower right corner is Scirpuslike Sedge (*Carex scirpoidea*, S2 – Sensitive).



Figure 28. Old growth calcareous Sugar Maple – Yellow Birch floodplain forest on the Polletts Cove River. Note the lack of saplings because of heavy moose browsing.



Figure 29. Moderately calcareous old growth Sugar Maple – Yellow Birch forest from the base of the valley slope on the upper Polletts Cove River.



Figure 30. Sloped seepage fen on highland plateau along the margins of the upper Red River, with Sean Blaney and Sean Basquill.



Figure 31. Open, mature, Red Oak-dominated forest on the LaHave River, between Bridgewater and Cookville. The grass-like understory dominant is the uncommon Forest Sedge (*Carex lucorum*, S4 – Secure).



Figure 32. Broad cobble shoreline on Wentzells Lake dominated by the Atlantic Coastal Plain variety of Switch Grass (*Panicum virgatum* var. *spissum*). Several other Atlantic Coastal Plain-affiliated species co-occur in this habitat.



Figure 33. Two examples of typical narrow open shoreline zones along the LaHave River. In the photo above, the Atlantic Coastal Plain-affiliated False Water Pepper (*Polygonum hydropiperoides*) is dominant in shallow water shoreline, and the pink flowered plant is Swamp Milkweed (*Asclepias incarnata*, most or all of which was the less common hairy var. *pulchra*, S3 – Sensitive)



Figure 34. Two examples of broader open shoreline communities on the LaHave River. Above is a tall meadow community of Tall Cordgrass (*Spartina pectinata*) and Canada Bluejoint (*Calamagrostis canadensis*), and below is a cobble bar subject to severe flood disturbance dominated by Indian Hemp (*Apocynum cannabinum*, S4 - Secure), a provincially uncommon species that is a specialist of such habitats.



Figure 35. Two examples of rock outcrop shorelines along the LaHave River. The lower one is at Frideaux Falls just downstream of the mouth of the West LaHave River, one of several rapids with shoreline cliffs on the river.



Figure 36. Two rock outcrop shoreline communities around Darrs Falls and Frideaux Falls near the mouth of the West LaHave River. Bearberry (*Arctostaphylos uva-ursi*) is the dominant species in the lower photo.



Figure 37. Larger open marsh communities on the LaHave River. Above is a Canada Bluejoint (*Calamagrostis canadensis*)-dominated marsh around Pinehurst, north of Wentzells Lake, and below is a shallow water Pickerel-weed (*Pontederia cordata*)-dominated marsh at Bruhms Lake near West Northfield.



Figure 38. Floodplain Red Maple forest along the LaHave River just north of Wentzells Lake, with the rare Tall Woodreed (*Cinna latifolia*, S1 – May Be At Risk), which was widely present in similar habitats and abundant in this example, in the left foreground.



Figure 39. Old growth Eastern Hemlock-dominated forest on the west side of the LaHave River, just north of the mouth of the West LaHave River.



Figure 40. Brackish shoreline marsh communities in the tidal lower LaHave River where the provincially Vulnerable Eastern *Lilaeopsis* (*Lilaeopsis chinense*, S2 – Sensitive), and Seaside Brookweed (*Samolus valerandi* ssp. *parviflorus*, S2 – Sensitive) are present. Saltwater Cordgrass (*Spartina alterniflora*) is the dominant in both sites, and the photo above shows the proximity of shoreline development typical of much of the estuary.

Appendix 1. Vascular plants documented during fieldwork on the LaHave River and Polletts Cove – Blair Rivers areas during 2013 NS Species at Risk Conservation Fund fieldwork, with provincial status ranks (see Methods).

Species / Family	Common Name	S-rank	GS Rank	ID Note	LaHave	Polletts
LYCOPODIACEAE		CLUBMOSES				
<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss	S3	Sensitive			x
<i>Huperzia lucidula</i>	Shining Firmoss	S5	Secure		x	x
<i>Lycopodiella inundata</i>	Northern Bog Clubmoss	S5	Secure			x
<i>Lycopodium annotinum</i>	Stiff Clubmoss	S5	Secure		x	x
<i>Lycopodium clavatum</i>	Running Clubmoss	S5	Secure	ID refers to the sp. in the broad sense	x	x
<i>Lycopodium dendroideum</i>	Round-branched Tree-clubmoss	S5	Secure		x	x
<i>Lycopodium digitatum</i>	Southern Clubmoss	S5	Secure		x	x
<i>Lycopodium hickeyi</i>	Hickey's Tree-clubmoss	S4?	Secure		x	
<i>Lycopodium lagopus</i>	One-cone clubmoss	S4	Secure		x	
<i>Lycopodium obscurum</i>	Flat-branched Tree-clubmoss	S4S5	Secure		x	
<i>Lycopodium tristachyum</i>	Blue Groundcedar	S4	Secure			x
ISOETACEAE		QUILLWORTS				
<i>Isoetes echinospora</i>	Spiny-Spored Quillwort	S5	Secure		x	
<i>Isoetes lacustris</i>	Lake Quillwort	S4	Secure		x	
EQUISETACEAE		HORSETAILS				
<i>Equisetum arvense</i>	Field Horsetail	S5	Secure		x	x
<i>Equisetum fluviatile</i>	Water Horsetail	S5	Secure		x	x
<i>Equisetum hyemale</i> var. <i>affine</i>	Common Scouring-rush	S3S4	Secure			x
<i>Equisetum pratense</i>	Meadow Horsetail	S3	Sensitive			x
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5	Secure		x	x
<i>Equisetum variegatum</i>	Variiegated Horsetail	S3	Secure		x	
OPHIOGLOSSACEAE		GRAPE FERNS				
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern	S2S3	Sensitive			x
<i>Botrychium</i> sp.	grape fern sp.		[native]			x
<i>Botrychium virginianum</i>	Rattlesnake Fern	S4	Secure			x
OSMUNDACEAE		FLOWERING FERNS				
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5	Secure		x	x
<i>Osmunda claytoniana</i>	Interrupted Fern	S5	Secure		x	x
<i>Osmunda regalis</i> var. <i>spectabilis</i>	Royal Fern	S5	Secure		x	
SCHIZAEACEAE		CURLYGRASS FERNS				
<i>Schizaea pusilla</i>	Little Curlygrass Fern	S3	Secure			x
POLYPODIACEAE		POLYPODIES				
<i>Polypodium virginianum</i>	Rock Polypody	S5	Secure		x	x
DENNSTAEDTIACEAE		HAY-SCENTED FERNS				
<i>Dennstaedtia punctilobula</i>	Eastern Hay-Scented Fern	S5	Secure		x	x
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	Bracken Fern	S5	Secure		x	x
ASPLENIACEAE		SPLEENWORTS				
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	S3	Secure			x
<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort	S2	Sensitive			x
THELYPTERIDACEAE		MARSH FERNS				
<i>Phegopteris connectilis</i>	Northern Beech Fern	S5	Secure		x	x
<i>Thelypteris noveboracensis</i>	New York Fern	S5	Secure		x	x
<i>Thelypteris palustris</i> var. <i>pubescens</i>	Eastern Marsh Fern	S5	Secure		x	
DRYOPTERIDACEAE		WOOD FERNS				
<i>Athyrium filix-femina</i> ssp. <i>angustum</i>	Common Lady Fern	S5	Secure		x	x
<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern	S1	May Be At Risk			x

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<i>Cystopteris tenuis</i>	A Bladderfern	S4	Secure			x
<i>Deparia acrostichoides</i>	Silvery Glade Fern	S4	Secure			x
<i>Dryopteris campyloptera</i>	Mountain Wood Fern	S5	Secure		x	x
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	S5	Secure		x	
<i>Dryopteris cristata</i>	Crested Wood Fern	S5	Secure		x	x
<i>Dryopteris filix-mas</i>	Male Fern	S4	Secure			x
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5	Secure		x	x
<i>Dryopteris marginalis</i>	Marginal Wood Fern	S5	Secure		x	x
<i>Gymnocarpium dryopteris</i>	Common Oak Fern	S5	Secure		x	x
<i>Matteuccia struthiopteris</i>	Ostrich Fern	S5	Secure		x	x
<i>Onoclea sensibilis</i>	Sensitive Fern	S5	Secure		x	x
<i>Polystichum acrostichoides</i>	Christmas Fern	S5	Secure		x	x
<i>Polystichum braunii</i>	Braun's Holly Fern	S4	Secure			x
<i>Woodsia glabella</i>	Smooth Cliff Fern	S2	Sensitive			x
<i>Woodsia ilvensis</i>	Rusty Cliff Fern	S4	Secure		x	x
TAXACEAE	YEWS					
<i>Taxus canadensis</i>	Canada Yew	S5	Secure		x	x
PINACEAE	PINES					
<i>Abies balsamea</i>	Balsam Fir	S5	Secure		x	x
<i>Larix laricina</i>	Tamarack	S5	Secure		x	x
<i>Picea glauca</i>	White Spruce	S5	Secure		x	x
<i>Picea mariana</i>	Black Spruce	S5	Secure		x	x
<i>Picea rubens</i>	Red Spruce	S5	Secure		x	
<i>Pinus resinosa</i>	Red Pine	S4S5	Secure		x	
<i>Pinus strobus</i>	Eastern White Pine	S5	Secure		x	
<i>Pinus sylvestris</i>	Scotch Pine	SNA	Exotic		x	
<i>Tsuga canadensis</i>	Eastern Hemlock	S4S5	Secure		x	
CUPRESSACEAE	CYPRESSES					
<i>Juniperus communis</i>	Common Juniper	S5	Secure		x	x
<i>Juniperus horizontalis</i>	Creeping Juniper	S4	Secure			x
NYMPHAEACEAE	WATER-LILIES					
<i>Nuphar lutea ssp. variegata</i>	Variiegated Pond-lily	S5	Secure		x	x
<i>Nymphaea odorata</i>	Fragrant Water-lily	S5	Secure		x	
CABOMBACEAE	WATER-SHIELDS					
<i>Brasenia schreberi</i>	Water-shield	S5	Secure		x	
CERATOPHYLLACEAE	COONTAILS					
<i>Ceratophyllum echinatum</i>	Prickly Hornwort	S2S3	Sensitive		x	
RANUNCULACEAE	BUTTERCUPS					
<i>Actaea pachypoda</i>	White Baneberry	S4	Secure			x
<i>Actaea rubra</i>	Red Baneberry	S5	Secure			x
<i>Anemone virginiana var. alba</i>	Virginia Anemone	S1S2	Sensitive	ID vs var. virginiana probable only	x	
<i>Aquilegia vulgaris</i>	European Columbine	SNA	Exotic		x	
<i>Clematis virginiana</i>	Virginia Clematis	S5	Secure		x	
<i>Coptis trifolia</i>	Goldthread	S5	Secure		x	x
<i>Ranunculus abortivus</i>	Kidney-Leaved Buttercup	S4S5	Secure			x
<i>Ranunculus acris</i>	Common Buttercup	SNA	Exotic		x	x
<i>Ranunculus cymbalaria</i>	Seaside Buttercup	S5	Secure		x	
<i>Ranunculus flammula var. filiformis</i>	Lesser Spearwort	S5	Secure		x	
<i>Ranunculus recurvatus</i>	Hooked Buttercup	S4	Secure		x	x
<i>Ranunculus repens</i>	Creeping Buttercup	SNA	Exotic		x	x
<i>Thalictrum pubescens</i>	Tall Meadow-Rue	S5	Secure		x	x
BERBERIDACEAE	BARBERRIES					

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<i>Berberis thunbergii</i>	Japanese Barberry	SNA	Exotic		x	
<i>Berberis vulgaris</i>	Common Barberry	SNA	Exotic		x	
HAMAMELIDACEAE		WITCH-HAZELS				
<i>Hamamelis virginiana</i>	American Witch-Hazel	S5	Secure	ID to sp. probable, not confirmed	x	
ULMACEAE		ELMS				
<i>Ulmus americana</i>	White Elm	S4	Secure		x	x
URTICACEAE		NETTLES				
<i>Boehmeria cylindrica</i>	Small-spike False-nettle	S1	May Be At Risk		x	
<i>Urtica dioica</i> ssp. <i>dioica</i>	Stinging Nettle	SNA	Exotic		x	x
<i>Urtica dioica</i> ssp. <i>gracilis</i>	Stinging Nettle	S4	Secure	ID uncertain; no specimen	x	x
MYRICACEAE		BAYBERRIES				
<i>Comptonia peregrina</i>	Sweet-fern	S5	Secure		x	
<i>Morella pensylvanica</i>	Northern Bayberry	S5	Secure		x	x
<i>Myrica gale</i>	Sweet Gale	S5	Secure		x	x
FAGACEAE		BEECHES				
<i>Fagus grandifolia</i>	American Beech	S5	Secure		x	
<i>Quercus rubra</i>	Northern Red Oak	S5	Secure		x	x
BETULACEAE		BIRCHES				
<i>Alnus incana</i> ssp. <i>rugosa</i>	Speckled Alder	S5	Secure		x	x
<i>Alnus serrulata</i>	Smooth Alder	S3	Sensitive	likely some influence of hybridization with <i>A. incana</i> ssp. <i>rugosa</i>	x	
<i>Alnus serrulata</i> x <i>incana</i> ssp. <i>rugosa</i>	a hybrid Alder		[native; unranked]		x	
<i>Alnus viridis</i> ssp. <i>crispa</i>	Green Alder	S5	Secure		x	x
<i>Betula alleghaniensis</i>	Yellow Birch	S5	Secure		x	x
<i>Betula borealis</i>	Northern Birch	S2	Sensitive	ID needs confirmation	x	
<i>Betula papyrifera</i> var. <i>cordifolia</i>	Heart-leaved Birch	S5	Secure			x
<i>Betula papyrifera</i> var. <i>papyrifera</i>	Heart-leaved Birch	S5	Secure		x	
<i>Betula populifolia</i>	Gray Birch	S5	Secure		x	x
<i>Betula pumila</i>	Bog Birch	S2S3	Sensitive			x
<i>Corylus cornuta</i>	Beaked Hazel	S5	Secure		x	x
<i>Ostrya virginiana</i>	Ironwood	S5	Secure		x	
CHENOPODIACEAE		GOOSEFOOTS				
<i>Atriplex prostrata</i>	Thin-leaved Orache	S5	Secure		x	
<i>Chenopodium album</i>	Common Lamb's Quarters	SNA	Exotic		x	
<i>Salicornia maritima</i>	Sea Glasswort	S5	Secure		x	
CARYOPHYLLACEAE		PINKS				
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	Common Chickweed	SNA	Exotic		x	x
<i>Dianthus armeria</i>	Deptford Pink	SNA	Exotic		x	x
<i>Honckenya peploides</i> ssp. <i>robusta</i>	Seabeach Sandwort	S5	Secure		x	
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	S5	Secure		x	x
<i>Sagina procumbens</i>	Procumbent Pearlwort	S5	Exotic			x
<i>Spergularia canadensis</i>	Canada Sandspurrey	S4	Secure		x	
<i>Spergularia rubra</i>	Ruby Sandspurrey	SNA	Exotic		x	x
<i>Stellaria graminea</i>	Little Starwort	SNA	Exotic		x	x
POLYGONACEAE		SMARTWEEDS				
<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed	S3?	Undetermined		x	
<i>Polygonum amphibium</i> var. <i>stipulaceum</i>	Water Smartweed	S4S5	Secure		x	

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<i>Polygonum aviculare</i>	Prostrate Knotweed	S5	Secure		x	
<i>Polygonum cilinode</i>	Fringed Black Bindweed	S5	Secure		x	x
<i>Polygonum convolvulus</i>	Eurasian Black Bindweed	SNA	Exotic		x	
<i>Polygonum cuspidatum</i>	Japanese Knotweed	SNA	Exotic		x	
<i>Polygonum hydropiper</i>	Marshpepper Smartweed	SNA	Exotic		x	x
<i>Polygonum hydropiperoides</i>	False Waterpepper	S5	Secure		x	x
<i>Polygonum persicaria</i>	Spotted Lady's-thumb	SNA	Exotic		x	x
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5	Secure		x	x
<i>Polygonum scandens</i>	Climbing False Buckwheat	S3	Sensitive		x	
<i>Polygonum viviparum</i>	Alpine Bistort	S1	May Be At Risk			x
<i>Rumex acetosa</i>	Garden Sorrel	SNA	Exotic		x	
<i>Rumex acetosella</i>	Sheep Sorrel	SNA	Exotic		x	x
<i>Rumex crispus</i>	Curled Dock	SNA	Exotic		x	x
<i>Rumex obtusifolius</i>	Bitter Dock	SNA	Exotic		x	x
<i>Rumex orbiculatus</i>	Greater Water Dock	S5	Secure		x	x
PLUMBAGINACEAE		LEADWORTS				
<i>Limonium carolinianum</i>	Sea Lavender	S5	Secure		x	
CLUSIACEAE		ST. JOHN'S-WORTS				
<i>Hypericum boreale</i>	Northern St John's-Wort	S5	Secure		x	
<i>Hypericum canadense</i>	Canada St John's-wort	S5	Secure		x	
<i>Hypericum ellipticum</i>	Pale St John's-Wort	S5	Secure		x	
<i>Hypericum gentianoides</i>	False St John's-wort	SNA	Exotic		x	
<i>Hypericum mutilum</i>	Dwarf St John's-wort	S4S5	Secure		x	
<i>Hypericum perforatum</i>	Common St. John's-wort	SNA	Exotic		x	x
<i>Triadenum fraseri</i>	Fraser's Marsh St John's-wort	S5	Secure	ID uncertain vs. virginicum	x	x
<i>Triadenum virginicum</i>	Virginia St John's-wort	S5	Secure		x	
TILIACEAE		LINDENS				
<i>Tilia cordata</i>	Little-leaved Linden	SNA	Exotic		x	
MALVACEAE		MALLOWS				
<i>Malva moschata</i>	Musk Mallow	SNA	Exotic			x
SARRACENIACEAE		PITCHER PLANTS				
<i>Sarracenia purpurea</i>	Northern Pitcher Plant	S5	Secure			x
DROSERACEAE		SUNDEWS				
<i>Drosera intermedia</i>	Spoon-Leaved Sundew	S5	Secure		x	x
<i>Drosera rotundifolia</i>	Round-leaved Sundew	S5	Secure		x	x
CISTACEAE		PINWEEDS				
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather	S2	Sensitive			x
<i>Lechea intermedia</i>	Large-pod Pinweed	S4	Secure		x	
VIOLACEAE		VIOLETS				
<i>Viola blanda var. palustriformis</i>	Sweet White Violet	S5	Secure			x
<i>Viola cucullata</i>	Marsh Blue Violet	S5	Secure		x	x
<i>Viola labradorica</i>	Labrador Violet	S5	Secure	ID to sp. probable, not confirmed	x	
<i>Viola lanceolata</i>	Lance-leaved Violet	S5	Secure		x	
<i>Viola macloskeyi ssp. pallens</i>	Small White Violet	S5	Secure		x	x
<i>Viola pubescens</i>	Downy Yellow Violet	S4	Secure			x
<i>Viola sagittata var. ovata</i>	Arrow-Leaved Violet	S3S4	Secure		x	
<i>Viola sororia</i>	Woolly Blue Violet	S5	Secure		x	x
<i>Viola x sublanceolata</i>	Lance-leaf Violet	S4	Secure		x	
SALICACEAE		WILLOWS				
<i>Populus alba</i>	White Poplar	SNA	Exotic		x	
<i>Populus balsamifera</i>	Balsam Poplar	S4	Secure		x	x
<i>Populus grandidentata</i>	Large-toothed Aspen	S5	Secure		x	

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<i>Populus tremuloides</i>	Trembling Aspen	S5	Secure		x	
<i>Salix bebbiana</i>	Bebb's Willow	S5	Secure		x	
<i>Salix discolor</i>	Pussy Willow	S5	Secure		x	
<i>Salix eriocephala</i>	Cottony Willow	S5	Secure		x	
<i>Salix humilis</i>	Upland Willow	S5	Secure		x	x
<i>Salix lucida</i>	Shining Willow	S5	Secure		x	
<i>Salix pyrifolia</i>	Balsam Willow	S5	Secure		x	x
<i>Salix sericea</i>	Silky Willow	S2	May Be At Risk		x	
<i>Salix x pendulina</i>	Weeping Willow	SNA	0		x	
<i>Salix x rubens</i>	a Willow	SNA	Exotic		x	
BRASSICACEAE	MUSTARDS					
<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress	S1S2	May Be At Risk			x
<i>Barbarea vulgaris</i>	Yellow Rocket	SNA	Exotic		x	
<i>Cardamine diphylla</i>	Two-leaved Toothwort	S4	Secure			x
<i>Cardamine pennsylvanica</i>	Pennsylvania Bittercress	S5	Secure		x	x
<i>Draba arabisans</i>	Rock Whitlow-Grass	S2	Sensitive			x
<i>Raphanus raphanistrum</i>	Wild Radish	SNA	Exotic		x	
<i>Sisymbrium officinale</i>	Hedge Mustard	SNA	Exotic		x	
EMPETRACEAE	CROWBERRIES					
<i>Empetrum eamesii</i>	Pink Crowberry	S3	Sensitive			x
<i>Empetrum nigrum</i>	Black Crowberry	S5	Secure			x
ERICACEAE	HEATHS					
<i>Andromeda polifolia</i> var. <i>glaucophylla</i>	Bog Rosemary	S5	Secure			x
<i>Arctostaphylos uva-ursi</i>	Common Bearberry	S4	Secure			x
<i>Chamaedaphne calyculata</i>	Leatherleaf	S5	Secure		x	x
<i>Epigaea repens</i>	Trailing Arbutus	S5	Secure		x	x
<i>Gaultheria hispidula</i>	Creeping Snowberry	S5	Secure		x	x
<i>Gaultheria procumbens</i>	Eastern Teaberry	S5	Secure		x	
<i>Gaylussacia baccata</i>	Black Huckleberry	S5	Secure		x	
<i>Gaylussacia bigeloviana</i>	Dwarf Huckleberry	S5	Secure			x
<i>Kalmia angustifolia</i>	Sheep Laurel	S5	Secure		x	x
<i>Kalmia polifolia</i>	Pale Bog Laurel	S5	Secure			x
<i>Ledum groenlandicum</i>	Common Labrador Tea	S5	Secure		x	x
<i>Rhododendron canadense</i>	Rhodora	S5	Secure		x	x
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	S5	Secure		x	x
<i>Vaccinium boreale</i>	Northern Blueberry	S3	Sensitive			x
<i>Vaccinium caespitosum</i>	Dwarf Bilberry	S3	Secure		x	
<i>Vaccinium macrocarpon</i>	Large Cranberry	S5	Secure		x	
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	S5	Secure		x	x
<i>Vaccinium oxycoccos</i>	Small Cranberry	S5	Secure			x
<i>Vaccinium vitis-idaea</i> ssp. <i>minus</i>	Mountain Cranberry	S5	Secure		x	x
PYROLACEAE	PYROLAS					
<i>Orthilia secunda</i>	One-sided Wintergreen	S5	Secure			x
<i>Pyrola americana</i>	Round-leaved Pyrola	S5	Secure		x	
<i>Pyrola asarifolia</i>	Pink Pyrola	S3	Secure			x
<i>Pyrola elliptica</i>	Shinleaf	S5	Secure		x	x
<i>Pyrola minor</i>	Lesser Pyrola	S3	Sensitive			x
MONOTROPACEAE	INDIAN PIPES					
<i>Monotropa hypopithys</i>	Pinesap	S4	Secure		x	
<i>Monotropa uniflora</i>	Indian Pipe	S5	Secure		x	x
PRIMULACEAE	PRIMROSE					
<i>Anagallis arvensis</i>	Scarlet Pimperel	SNA	Exotic		x	
<i>Glaux maritima</i>	Sea Milkwort	S5	Secure		x	

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<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife	S4	Secure		x	
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5	Secure		x	
<i>Samolus valerandi ssp. parviflorus</i>	Seaside Brookweed	S3	Sensitive		x	
<i>Trientalis borealis</i>	Northern Starflower	S5	Secure		x	x
HYDRANGEACEAE	HYDRANGEAS					
<i>Hydrangea arborescens</i>	Wild Hydrangea	SNA	Exotic		x	
GROSSULARIACEAE	GOOSEBERRIES					
<i>Ribes glandulosum</i>	Skunk Currant	S5	Secure			x
<i>Ribes hirtellum</i>	Smooth Gooseberry	S5	Secure			x
<i>Ribes lacustre</i>	Bristly Black Currant	S5	Secure			x
<i>Ribes triste</i>	Swamp Red Currant	S4	Secure			x
CRASSULACEAE	STONECROPS					
<i>Rhodiola rosea</i>	Roseroot	S4	Secure			x
SAXIFRAGACEAE	SAXIFRAGES					
<i>Chrysosplenium americanum</i>	American Golden Saxifrage	S5	Secure		x	x
<i>Mitella nuda</i>	Naked Bishop's-Cap	S5	Secure			x
<i>Saxifraga oppositifolia</i>	Purple Mountain Saxifrage	S1	May Be At Risk			x
<i>Saxifraga paniculata ssp. neogaea</i>	White Mountain Saxifrage	S2	Sensitive			x
ROSACEAE	ROSES					
<i>Agrimonia gryposepala</i>	Hooked Agrimony	S3	Secure		x	
<i>Agrimonia striata</i>	Woodland Agrimony	S5	Secure			x
<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	S5	Secure		x	x
<i>Amelanchier laevis</i>	Smooth Serviceberry	S5	Secure		x	x
<i>Amelanchier stolonifera</i>	Running Serviceberry	S3?	Secure		x	
<i>Argentina anserina</i>	Common Silverweed	S5	Secure		x	
<i>Argentina egedii</i>	Egede's Silverweed	S5	Secure		x	
<i>Comarum palustre</i>	Marsh Cinquefoil	S5	Secure		x	
<i>Crataegus monogyna</i>	English Hawthorn	SNA	Exotic		x	
<i>Crataegus sp.</i>	hawthorn sp.		[native]		x	
<i>Dalibarda repens</i>	Dewdrop	S5	Secure		x	
<i>Dasiphora fruticosa ssp. floribunda</i>	Shrubby Cinquefoil	S4	Secure			x
<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry	S3S4	Secure			x
<i>Fragaria virginiana</i>	Wild Strawberry	S5	Secure		x	x
<i>Geum canadense</i>	White Avens	S4S5	Secure		x	x
<i>Geum laciniatum</i>	Rough Avens	S5	Secure		x	
<i>Geum macrophyllum</i>	Large-Leaved Avens	S5	Secure		x	x
<i>Geum rivale</i>	Water Avens	S5	Secure			x
<i>Malus baccata</i>	Siberian Crabapple	SNA	Exotic		x	
<i>Malus pumila</i>	Common Apple	SNA	Exotic		x	x
<i>Photinia floribunda</i>	Purple Chokeberry	S5	Secure	ID to sp. probable, not confirmed	x	x
<i>Photinia melanocarpa</i>	Black Chokeberry	S5	Secure		x	x
<i>Potentilla anglica</i>	English Cinquefoil	SNA	Exotic		x	
<i>Potentilla norvegica ssp. monspeliensis</i>	Rough Cinquefoil	S5	Secure		x	x
<i>Potentilla recta</i>	Sulphur Cinquefoil	SNA	Exotic		x	
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5	Secure		x	x
<i>Prunus pensylvanica</i>	Pin Cherry	S5	Secure		x	x
<i>Prunus serotina</i>	Black Cherry	S5	Secure		x	
<i>Prunus virginiana</i>	Chokecherry	S5	Secure		x	x
<i>Rosa carolina</i>	Carolina Rose	S4S5	Secure		x	
<i>Rosa multiflora</i>	Multiflora Rose	SNA	Exotic		x	
<i>Rosa nitida</i>	Shining Rose	S4	Secure		x	x
<i>Rosa palustris</i>	Swamp Rose	S4	Secure		x	

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<i>Rosa virginiana</i>	Virginia Rose	S5	Secure		x	x
<i>Rubus allegheniensis</i>	Alleghaney Blackberry	S5	Secure		x	
<i>Rubus canadensis</i>	Smooth Blackberry	S5	Secure		x	x
<i>Rubus chamaemorus</i>	Cloudberry	S4	Secure			x
<i>Rubus hispida</i>	Bristly Dewberry	S5	Secure		x	x
<i>Rubus idaeus ssp. strigosus</i>	Red Raspberry	S5	Secure		x	x
<i>Rubus pensilvanicus</i>	Pennsylvania Blackberry	S4	Secure		x	
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5	Secure		x	x
<i>Rubus setosus</i>	Bristly Blackberry	S4?	Secure			x
<i>Sanguisorba canadensis</i>	Canada Burnet	S4	Secure			x
<i>Sibbaldiopsis tridentata</i>	Three-Toothed Cinquefoil	S5	Secure		x	x
<i>Sorbus americana</i>	American Mountain Ash	S5	Secure		x	x
<i>Sorbus aucuparia</i>	European Mountain Ash	SNA	Exotic		x	
<i>Sorbus decora</i>	Showy Mountain Ash	S4	Secure			x
<i>Spiraea alba var. latifolia</i>	White Meadowsweet	S5	Secure		x	x
<i>Spiraea septentrionalis</i>	Northern Meadowsweet	S1?	May Be At Risk			x
<i>Spiraea tomentosa</i>	Steeplebush	S5	Secure		x	
FABACEAE	BEANS					
<i>Amphicarpaea bracteata</i>	American Hog Peanut	S4	Secure		x	
<i>Apios americana</i>	American Groundnut	S5	Secure		x	
<i>Lathyrus japonicus</i>	Beach Pea	S5	Secure		x	
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	SNA	Exotic		x	
<i>Lupinus polyphyllus</i>	Large-Leaved Lupine	SNA	Exotic		x	
<i>Medicago lupulina</i>	Black Medick	SNA	Exotic		x	
<i>Melilotus albus</i>	White Sweet-clover	SNA	Exotic		x	
<i>Oxytropis campestris var. johannensis</i>	Field Locoweed	S1	May Be At Risk			x
<i>Robinia pseudoacacia</i>	Black Locust	SNA	Exotic		x	
<i>Trifolium arvense</i>	Rabbit's-foot Clover	SNA	Exotic		x	
<i>Trifolium aureum</i>	Yellow Clover	SNA	Exotic		x	
<i>Trifolium campestre</i>	Low Hop Clover	SNA	Exotic		x	
<i>Trifolium dubium</i>	Small Hop Clover	SNA	Exotic		x	
<i>Trifolium hybridum</i>	Alsike Clover	SNA	Exotic		x	
<i>Trifolium pratense</i>	Red Clover	SNA	Exotic		x	x
<i>Trifolium repens</i>	White Clover	SNA	Exotic		x	x
<i>Vicia cracca</i>	Tufted Vetch	SNA	Exotic		x	x
<i>Vicia tetrasperma</i>	Four-seeded Vetch	SNA	Exotic		x	
ELAEAGNACEAE	OLEASTERS					
<i>Elaeagnus umbellata</i>	Autumn Olive	SNA	Exotic		x	
<i>Shepherdia canadensis</i>	Soapberry	S2S3	Sensitive			x
HALORAGACEAE	WATER-MILFOILS					
<i>Myriophyllum humile</i>	Low Water Milfoil	S4	Secure		x	
<i>Proserpinaca palustris</i>	Marsh Mermaidweed	S3	Secure		x	
<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed	S3	Secure		x	
LYTHRACEAE	LOOSESTRIFES					
<i>Lythrum salicaria</i>	Purple Loosestrife	SNA	Exotic		x	
ONAGRACEAE	EVENING-PRIMROSES					
<i>Chamerion angustifolium</i>	Fireweed	S5	Secure		x	x
<i>Circaea alpina</i>	Small Enchanter's Nightshade	S5	Secure		x	x
<i>Epilobium ciliatum</i>	Northern Willowherb	S5	Secure		x	x
<i>Epilobium hornemannii</i>	Hornemann's Willowherb	S3	Secure			x
<i>Epilobium leptophyllum</i>	Bog Willowherb	S5	Secure		x	
<i>Epilobium palustre</i>	Marsh Willowherb	S5	Secure		x	x

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<i>Ludwigia palustris</i>	Marsh Seedbox	S5	Secure		x	
<i>Oenothera biennis</i>	Common Evening Primrose	S5	Secure		x	x
<i>Oenothera parviflora</i>	Small-flowered Evening Primrose	S4?	Secure		x	x
<i>Oenothera perennis</i>	Perennial Evening Primrose	S5	Secure		x	
CORNACEAE	DOGWOODS					
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S5	Secure		x	x
<i>Cornus canadensis</i>	Bunchberry	S5	Secure		x	x
<i>Cornus rugosa</i>	Round-leaved Dogwood	S4	Secure		x	
<i>Cornus sericea</i>	Red Osier Dogwood	S5	Secure		x	
<i>Cornus x intermedia</i>	a hybrid Dogwood	SNA	Not Assessed			x
VISACEAE	MISTLETOES					
<i>Arceuthobium pusillum</i>	Eastern Dwarf Mistletoe	S5	Secure			x
CELASTRACEAE	STAFFTREES					
<i>Euonymus alatus</i>	Winged Spindletree	SNA	Exotic		x	
AQUIFOLIACEAE	HOLLIES					
<i>Ilex verticillata</i>	Common Winterberry	S5	Secure		x	
<i>Nemopanthus mucronatus</i>	Mountain Holly	S5	Secure		x	x
EUPHORBIACEAE	SPURGES					
<i>Chamaesyce maculata</i>	Spotted Spurge	SNA	Exotic		x	
RHAMNACEAE	BUCKTHORNS					
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	Exotic		x	
VITACEAE	GRAPES					
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	SNA	Exotic		x	
<i>Vitis sp.</i>	grape sp.		[exotic]		x	
ACERACEAE	MAPLES					
<i>Acer pensylvanicum</i>	Striped Maple	S5	Secure		x	x
<i>Acer platanoides</i>	Norway Maple	SNA	Exotic		x	
<i>Acer rubrum</i>	Red Maple	S5	Secure		x	x
<i>Acer saccharum</i>	Sugar Maple	S5	Secure		x	x
<i>Acer spicatum</i>	Mountain Maple	S5	Secure			x
ANACARDIACEAE	CASHEWS					
<i>Rhus typhina</i>	Staghorn Sumac	S4S5	Secure		x	
<i>Toxicodendron radicans</i>	Poison Ivy	S4	Secure		x	
<i>Toxicodendron rydbergii</i>	Northern Poison Oak	S5	Secure		x	x
OXALIDACEAE	WOOD SORRELS					
<i>Oxalis montana</i>	Common Wood Sorrel	S5	Secure		x	x
<i>Oxalis stricta</i>	European Wood Sorrel	S5	Secure		x	
GERANIACEAE	GERANIUMS					
<i>Geranium robertianum</i>	Herb Robert	S4	Secure			x
BALSAMINACEAE	TOUCH-ME-NOTS					
<i>Impatiens capensis</i>	Spotted Jewelweed	S5	Secure		x	x
ARALIACEAE	SARSAPARILLAS					
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5	Secure		x	x
APIACEAE	CARROTS					
<i>Aegopodium podagraria</i>	Bishop's Goutweed	SNA	Exotic		x	
<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	S3	Secure			x
<i>Angelica lucida</i>	Seaside Angelica	S4	Secure			x
<i>Carum carvi</i>	Wild Caraway	SNA	Exotic			x
<i>Cicuta bulbifera</i>	Bulbous Water-hemlock	S5	Secure		x	
<i>Cicuta maculata</i>	Spotted Water-Hemlock	S5	Secure		x	
<i>Daucus carota</i>	Queen Anne's Lace	SNA	Exotic		x	
<i>Heraclium maximum</i>	Common Cow Parsnip	S5	Secure			x
<i>Hydrocotyle americana</i>	American Marsh Pennywort	S5	Secure		x	

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<i>Ligusticum scoticum</i>	Scotch Lovage	S5	Secure		x	
<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	S2	Sensitive		x	
<i>Osmorhiza berteroi</i>	Mountain Sweet Cicely	S4	Secure			x
<i>Osmorhiza claytonii</i>	Hairy Sweet Cicely	S4	Secure			x
<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely	S2	May Be At Risk			x
<i>Pastinaca sativa</i>	Wild Parsnip	SNA	Exotic		x	
<i>Sanicula marilandica</i>	Maryland Sanicle	S4	Secure		x	x
<i>Sium suave</i>	Common Water Parsnip	S5	Secure		x	
APOCYNACEAE		DOGBANES				
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	S5	Secure		x	
<i>Apocynum cannabinum</i>	Indian Hemp	S4	Secure		x	
<i>Apocynum x floribundum</i>	a hybrid Dogbane	SNA	Not Assessed		x	
<i>Vinca minor</i>	Lesser Periwinkle	SNA	Exotic		x	
ASCLEPIADACEAE		MILKWEEDS				
<i>Asclepias incarnata ssp. pulchra</i>	Swamp Milkweed	S3?	Undetermined	poss. some ssp. incarnata as well	x	
SOLANACEAE		NIGHTSHADES				
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA	Exotic		x	
CONVOLVULACEAE		BINDWEEDS				
<i>Calystegia sepium</i>	Hedge False Bindweed	S5	Secure		x	
CUSCUTACEAE		DODDERS				
<i>Cuscuta groenovii</i>	Swamp Dodder	S4S5	Secure		x	
MENYANTHACEAE		BOG-BEANS				
<i>Menyanthes trifoliata</i>	Bog Buckbean	S5	Secure			x
<i>Nymphoides cordata</i>	Little Floatingheart	S5	Secure		x	
BORAGINACEAE		BORAGES				
<i>Myosotis laxa</i>	Small Forget-Me-Not	S5	Secure		x	x
VERBENACEAE		VERVAINS				
<i>Verbena hastata</i>	Blue Vervain	S3	Secure		x	
LAMIACEAE		MINTS				
<i>Clinopodium vulgare</i>	Wild Basil	S5	Secure			x
<i>Galeopsis bifida</i>	Bifid Hemp-nettle	SNA	Exotic		x	
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	SNA	Exotic		x	x
<i>Glechoma hederacea</i>	Ground Ivy	SNA	Exotic		x	
<i>Lycopus americanus</i>	American Water Horehound	S5	Secure		x	
<i>Lycopus uniflorus</i>	Northern Water Horehound	S5	Secure		x	x
<i>Mentha arvensis</i>	Wild Mint	S5	Secure		x	x
<i>Mentha x piperita</i>	Peppermint	SNA	Exotic	ID to sp. probable, not confirmed	x	x
<i>Origanum vulgare</i>	Wild Marjoram	SNA	Exotic		x	
<i>Prunella vulgaris</i>	Common Self-heal	S5	Secure		x	x
<i>Scutellaria galericulata</i>	Marsh Skullcap	S5	Secure		x	x
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	S5	Secure		x	
<i>Scutellaria x churchilliana</i>	Mad Dog Skullcap	SNA	Not Assessed		x	
<i>Teucrium canadense</i>	Canada Germander	S3	Sensitive		x	
HIPPURIDACEAE		MARE'S-TAILS				
<i>Hippuris vulgaris</i>	Common Mare's-Tail	S4	Secure			x
CALLITRICHACEAE		WATER-STARWORTS				
<i>Callitriche sp.</i>	water-starwort sp.		[native]		x	x
PLANTAGINACEAE		PLANTAINS				
<i>Plantago aristata</i>	Large-bracted Plantain	SNA	Exotic		x	
<i>Plantago lanceolata</i>	English Plantain	SNA	Exotic		x	x
<i>Plantago major</i>	Common Plantain	SNA	Exotic		x	x

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<i>Plantago maritima</i> var. <i>juncooides</i>	Seaside Plantain	S5	Secure		x	x
<i>Plantago rugelii</i>	Rugel's Plantain	S2S3	Secure	ID probable	x	
OLEACEAE	OLIVES					
<i>Fraxinus americana</i>	White Ash	S5	Secure		x	x
SCROPHULARIACEAE	FIGWORTS					
				ID to species probable but uncertain; no flowers present		
<i>Agalinis neoscotica</i>	Nova Scotia Agalinis	S3	Secure		x	
<i>Chaenorhinum minus</i>	Dwarf Snapdragon	SNA	Exotic		x	
<i>Chelone glabra</i>	White Turtlehead	S5	Secure		x	x
<i>Euphrasia nemorosa</i>	Common Eyebright	S5	Secure		x	x
<i>Gratiola aurea</i>	Golden Hedge-Hyssop	S5	Secure		x	
<i>Limosella australis</i>	Southern Mudwort	S3	Secure		x	
<i>Linaria vulgaris</i>	Butter-and-Eggs	SNA	Exotic		x	
<i>Melampyrum lineare</i>	American Cow Wheat	S5	Secure		x	x
<i>Nuttallanthus canadensis</i>	Canada Toadflax	SNA	Exotic		x	
<i>Rhinanthus minor</i>	Little Yellow Rattle	S5	Secure		x	x
<i>Verbascum thapsus</i>	Common Mullein	SNA	Exotic		x	
<i>Veronica officinalis</i>	Common Speedwell	S5	Exotic		x	x
<i>Veronica scutellata</i>	Marsh Speedwell	S5	Secure		x	
<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	Thyme-Leaved Speedwell	S2S3	Sensitive			x
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme-Leaved Speedwell	SNA	Exotic		x	x
OROBANCHACEAE	BROOMRAPES					
<i>Conopholis americana</i>	American Cancer-root	S1S2	May Be At Risk		x	
<i>Epifagus virginiana</i>	Beechdrops	S4	Secure		x	
LENTIBULARIACEAE	BLADDERWORTS					
<i>Utricularia cornuta</i>	Horned Bladderwort	S5	Secure		x	x
<i>Utricularia intermedia</i>	Flat-leaved Bladderwort	S5	Secure			x
<i>Utricularia macrorhiza</i>	Greater Bladderwort	S5	Secure		x	x
<i>Utricularia purpurea</i>	Eastern Purple Bladderwort	S5	Secure		x	
<i>Utricularia radiata</i>	Little Floating Bladderwort	S4	Secure		x	
CAMPANULACEAE	BELLFLOWERS					
<i>Campanula aparinoides</i>	Marsh Bellflower	[S3]	[Sensitive]			x
<i>Campanula rotundifolia</i>	Common Harebell	S5	Secure		x	x
<i>Lobelia dortmanna</i>	Water Lobelia	S5	Secure		x	
<i>Lobelia inflata</i>	Indian Tobacco	S5	Secure		x	
RUBIACEAE	BEDSTRAW					
<i>Galium aparine</i>	Common Bedstraw	S2S3	Sensitive			x
<i>Galium asprellum</i>	Rough Bedstraw	S5	Secure		x	x
<i>Galium kamtschaticum</i>	Northern Wild Licorice	S3	Secure			x
<i>Galium palustre</i>	Common Marsh Bedstraw	S5	Secure		x	x
<i>Galium poss. obtusum</i>	bedstraw sp.		[native]		x	
<i>Galium tinctorium</i>	Dyer's Bedstraw	S5	Secure		x	
<i>Galium trifidum</i>	Three-petaled Bedstraw	S5	Secure		x	x
<i>Galium triflorum</i>	Three-flowered Bedstraw	S5	Secure			x
<i>Mitchella repens</i>	Partridgeberry	S5	Secure		x	x
CAPRIFOLIACEAE	HONEYSUCKLES					
<i>Diervilla lonicera</i>	Northern Bush Honeysuckle	S5	Secure		x	x
<i>Linnaea borealis</i> ssp. <i>americana</i>	Twinflower	S5	Secure			x
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	S5	Secure		x	x
<i>Lonicera tatarica</i>	Tartarian Honeysuckle	SNA	Exotic		x	
<i>Lonicera villosa</i>	Mountain Fly Honeysuckle	S4S5	Secure			x

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<i>Sambucus nigra</i> ssp. <i>canadensis</i>	Black Elderberry	S5	Secure		x	x
<i>Sambucus racemosa</i>	Red Elderberry	S5	Secure		x	x
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	Thin-leaved Snowberry	SNA	Exotic		x	
<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed	S2S3	Sensitive			x
<i>Viburnum edule</i>	Squashberry	S3	Sensitive			x
<i>Viburnum lantanoides</i>	Hobblebush	S5	Secure		x	
<i>Viburnum nudum</i> var. <i>cassinoides</i>	Northern Wild Raisin	S5	Secure		x	x
<i>Viburnum opulus</i>	Highbush Cranberry	S4	Secure		x	
<i>Viburnum opulus</i> var. <i>americanum</i>	Highbush Cranberry	S4	Secure		x	x
ASTERACEAE		ASTERS				
<i>Achillea millefolium</i>	Common Yarrow	S5	Secure		x	x
<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5	Secure		x	
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5	Secure		x	x
<i>Antennaria howellii</i>	Howell's Pussytoes	S4?	Secure	upper surface of leaves green & hairless lvs remaining white-hairy on upper surface	x	x
<i>Antennaria neglecta</i>	Field Pussytoes	SNR	Undetermined		x	
<i>Antennaria parlinii</i>	a Pussytoes	S1	May Be At Risk		x	
<i>Arctium minus</i>	Common Burdock	SNA	Exotic		x	x
<i>Artemisia campestris</i> ssp. <i>borealis</i>	Field Wormwood	S1	May Be At Risk			x
<i>Artemisia vulgaris</i>	Common Wormwood	SNA	Exotic		x	
<i>Bidens frondosa</i>	Devil's Beggarticks	S5	Secure		x	
<i>Centaurea nigra</i>	Black Knapweed	SNA	Exotic		x	x
<i>Cirsium arvense</i>	Canada Thistle	SNA	Exotic		x	x
<i>Cirsium muticum</i>	Swamp Thistle	S5	Secure			x
<i>Cirsium vulgare</i>	Bull Thistle	SNA	Exotic		x	x
<i>Conyza canadensis</i>	Canada Horseweed	S5	Secure		x	x
<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	S5	Secure		x	x
<i>Erechtites hieraciifolia</i>	Eastern Burnweed	S5	Secure		x	
<i>Erigeron annuus</i>	Annual Fleabane	S4S5	Secure		x	x
<i>Erigeron strigosus</i>	Rough Fleabane	S5	Secure		x	x
<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	S5	Secure		x	x
<i>Eupatorium perfoliatum</i>	Common Boneset	S5	Secure		x	
<i>Eurybia macrophylla</i>	Large-leaved Aster	S5	Secure		x	
<i>Eurybia radula</i>	Low Rough Aster	S5	Secure		x	x
<i>Euthamia caroliniana</i>	Slender Fragrant Goldenrod	S4	Secure		x	
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5	Secure		x	x
<i>Galinsoga</i> sp.	quickweed sp.		[exotic]		x	
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	SNA	Exotic		x	
<i>Hieracium aurantiacum</i>	Orange Hawkweed	SNA	Exotic			x
<i>Hieracium caespitosum</i>	Field Hawkweed	SNA	Exotic			x
<i>Hieracium canadense</i>	Canada Hawkweed	S4S5	Secure		x	x
<i>Hieracium lachenalii</i>	Common Hawkweed	SNA	Exotic		x	x
<i>Hieracium murorum</i>	Wall Hawkweed	SNA	Exotic		x	x
<i>Hieracium paniculatum</i>	Panicled Hawkweed	S3	Secure		x	
<i>Hieracium pilosella</i>	Mouse-ear Hawkweed	SNA	Exotic		x	x
<i>Hieracium piloselloides</i>	Tall Hawkweed	SNA	Exotic	ID to sp. probable, not confirmed	x	x
<i>Hieracium scabrum</i>	Rough Hawkweed	S5	Secure		x	x
<i>Hieracium tridentatum</i>	Three-Tooth Hawkweed	SNA	Exotic		x	

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<i>Hieracium umbellatum</i>	Umbellate Hawkweed	SNR	Secure	ID uncertain ID uncertain vs. H. praealtum	x	
<i>Hieracium x floribundum</i>	Smoothish Hawkweed	SNA	Exotic		x	x
<i>Hypochaeris radicata</i>	Hairy Cat's-ear	SNA	Exotic			x
<i>Lactuca biennis</i>	Tall Blue Lettuce	S5	Secure		x	x
<i>Lactuca canadensis</i>	Canada Lettuce	S5	Secure		x	x
<i>Lactuca serriola</i>	Prickly Lettuce	SNA	Exotic		x	
<i>Leontodon autumnalis</i>	Fall Dandelion	SNA	Exotic		x	x
<i>Leucanthemum vulgare</i>	Oxeye Daisy	SNA	Exotic		x	x
<i>Matricaria discoidea</i>	Pineapple Weed	SNA	Exotic		x	x
<i>Megalodonta beckii</i>	Water Beggarticks	S3	Secure		x	
<i>Oclemena acuminata</i>	Whorled Wood Aster	S5	Secure		x	x
<i>Oclemena nemoralis</i>	Bog Aster	S5	Secure			x
<i>Oclemena x blakei</i>	a hybrid White Panicked American-Aster	S5	Secure		x	x
<i>Omalotheca sylvatica</i>	Woodland Cudweed	S4S5	Secure			x
<i>Packera aurea</i>	Golden Groundsel	S4	Secure			x
<i>Prenanthes altissima</i>	Tall Rattlesnakeroot	S5	Secure		x	x
<i>Prenanthes trifoliolata</i>	Three-leaved Rattlesnakeroot	S5	Secure		x	x
<i>Rudbeckia hirta var. pulcherrima</i>	Black-Eyed Susan	SNA	Exotic	garden form	x	
<i>Senecio jacobaea</i>	Tansy Ragwort	SNA	Exotic		x	x
<i>Senecio viscosus</i>	Sticky Ragwort	SNA	Exotic		x	
<i>Senecio vulgaris</i>	Common Ragwort	SNA	Exotic		x	
<i>Solidago bicolor</i>	White Goldenrod	S5	Secure		x	x
<i>Solidago canadensis</i>	Canada Goldenrod	S5	Secure		x	x
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	S5	Secure		x	x
<i>Solidago gigantea</i>	Giant Goldenrod	S5	Secure		x	
<i>Solidago juncea</i>	Early Goldenrod	S5	Secure		x	
<i>Solidago macrophylla</i>	Large-leaved Goldenrod	S4	Secure			x
<i>Solidago multiradiata</i>	Multi-rayed Goldenrod	S2	May Be At Risk			x
<i>Solidago nemoralis</i>	Gray-stemmed Goldenrod	S4S5	Secure		x	
<i>Solidago puberula</i>	Downy Goldenrod	S5	Secure		x	
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5	Secure		x	x
<i>Solidago sempervirens</i>	Seaside Goldenrod	S5	Secure		x	
<i>Solidago uliginosa</i>	Northern Bog Goldenrod	S5	Secure			x
<i>Sonchus arvensis</i>	Field Sow Thistle	SNA	Exotic		x	
<i>Sonchus asper</i>	Prickly Sow Thistle	SNA	Exotic		x	
<i>Symphotrichum lanceolatum</i>	Lance-leaved Aster	S4S5	Secure		x	
<i>Symphotrichum lateriflorum</i>	Calico Aster	S5	Secure		x	x
<i>Symphotrichum novi-belgii</i>	New York Aster	S5	Secure		x	x
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	S5	Secure		x	x
<i>Symphotrichum tradescantii</i>	Tradescant's Aster	S4	Secure		x	
<i>Symphotrichum undulatum</i>	Wavy-leaved Aster	S2	Sensitive		x	
<i>Tanacetum vulgare</i>	Common Tansy	SNA	Exotic		x	
<i>Taraxacum officinale</i>	Common Dandelion	SNA	Exotic		x	x
<i>Tragopogon pratensis</i>	Meadow Goatsbeard	SNA	Exotic		x	
<i>Tussilago farfara</i>	Coltsfoot	SNA	Exotic		x	x
ALISMATACEAE		WATER-PLANTAINS				
<i>Alisma triviale</i>	Northern Water Plantain	S5	Secure		x	
<i>Sagittaria cuneata</i>	Northern Arrowhead	S5	Secure		x	
<i>Sagittaria latifolia</i>	Broad-leaved Arrowhead	S5	Secure		x	
HYDROCHARITACEAE		WATER-WEEDS				
<i>Vallisneria americana</i>	Wild Celery	S2	May Be At Risk		x	

Species / Family	Common Name	S-rank	GS Rank	ID Note	LaHave	Polletts
JUNCAGINACEAE	ARROW-GRASSES					
<i>Triglochin gaspensis</i>	Gaspé Arrowgrass	S3?	Undetermined		x	
<i>Triglochin maritima</i>	Seaside Arrowgrass	S5	Secure		x	
POTAMOGETONACEAE	PONDWEEDS					
<i>Potamogeton epiphydrus</i>	Ribbon-leaved Pondweed	S5	Secure		x	x
<i>Potamogeton gramineus</i>	Variable-leaved Pondweed	S5	Secure		x	x
<i>Potamogeton natans</i>	Floating-leaved Pondweed	S5	Secure		x	
<i>Potamogeton oakesianus</i>	Oakes' Pondweed	S4S5	Secure			x
<i>Potamogeton pusillus</i>	Small Pondweed	S5	Secure		x	
RUPPIACEAE	WIGEON-GRASSES					
<i>Ruppia maritima</i>	Sea Ditchgrass	S5	Secure		x	
NAJADACEAE	NAIADS					
<i>Najas flexilis</i>	Slender Naiad	S5	Secure		x	
ZANNICHELLIACEAE	HORNED PONDWEEDS					
<i>Zannichellia palustris</i>	Horned Pondweed	S4	Secure		x	
ZOSTERACEAE	EELGRASSES					
<i>Zostera marina</i>	Common Eelgrass	S5	Secure		x	
ACORACEAE	SWEET FLAGS					
<i>Acorus americanus</i>	American Sweetflag	S4	Secure		x	
ARACEAE	ARUMS					
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	S4S5	Secure		x	
XYRIDACEAE	YELLOW-EYED GRASSES					
<i>Xyris difformis</i>	Bog Yellow-eyed-grass	S4	Secure		x	
ERIOCAULACEAE	PIPEWORTS					
<i>Eriocaulon aquaticum</i>	White Buttons	S5	Secure		x	x
JUNCACEAE	RUSHES					
<i>Juncus articulatus</i>	Jointed Rush	S5	Secure		x	x
<i>Juncus balticus</i> var. <i>littoralis</i>	Baltic Rush	S5	Secure		x	x
<i>Juncus brevicaudatus</i>	Narrow-Panicled Rush	S5	Secure		x	x
<i>Juncus bufonius</i>	Toad Rush	S5	Secure		x	x
<i>Juncus canadensis</i>	Canada Rush	S5	Secure		x	x
<i>Juncus effusus</i>	Soft Rush	S5	Secure		x	x
<i>Juncus filiformis</i>	Thread Rush	S5	Secure		x	x
<i>Juncus gerardii</i>	Black-Grass Rush	S5	Secure		x	
<i>Juncus militaris</i>	Bayonet Rush	S5	Secure		x	
<i>Juncus pelocarpus</i>	Brown-Fruited Rush	S5	Secure		x	
<i>Juncus tenuis</i>	Slender Rush	S5	Secure		x	x
<i>Juncus trifidus</i>	Highland Rush	S2S3	Sensitive			x
<i>Luzula acuminata</i>	Hairy Woodrush	S5	Secure		x	x
<i>Luzula multiflora</i>	Common Woodrush	S5	Secure		x	x
<i>Luzula parviflora</i>	Small-flowered Woodrush	S3S4	Secure			x
<i>Luzula spicata</i>	Spiked Woodrush	S1	May Be At Risk			x
CYPERACEAE	SEDGES					
<i>Bulbostylis capillaris</i>	Dense-tufted Hair Sedge	SNA	Exotic		x	
<i>Carex aquatilis</i>	Water Sedge	S5	Secure		x	x
<i>Carex arctata</i>	Black Sedge	S5	Secure		x	x
<i>Carex atlantica</i> ssp. <i>atlantica</i>	Atlantic Sedge	S4	Secure			x
<i>Carex atlantica</i> ssp. <i>capillacea</i>	Atlantic Sedge	S4	Secure	ID to sp. probable, not confirmed	x	
<i>Carex bromoides</i>	Bromelike Sedge	S4	Secure		x	
<i>Carex brunnescens</i> ssp. <i>sphaerostachya</i>	Brownish Sedge	S5	Secure			x
<i>Carex bullata</i>	Button Sedge	S4	Secure		x	

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<i>Carex canescens</i>	Silvery Sedge	S5	Secure			x
<i>Carex capillaris</i>	Hairlike Sedge	S2	Sensitive			x
<i>Carex communis</i>	Fibrous-Root Sedge	S5	Secure		x	x
<i>Carex crawfordii</i>	Crawford's Sedge	S5	Secure			x
<i>Carex crinita</i>	Fringed Sedge	S5	Secure		x	
<i>Carex debilis</i> var. <i>rudgei</i>	White-edged Sedge	S5	Secure		x	x
<i>Carex deweyana</i>	Dewey's Sedge	S5	Secure			x
<i>Carex diandra</i>	Lesser Panicked Sedge	S4	Secure			x
<i>Carex disperma</i>	Two-seeded Sedge	S5	Secure		x	
<i>Carex echinata</i>	Star Sedge	S5	Secure			x
<i>Carex exilis</i>	Coastal Sedge	S4	Secure			x
<i>Carex flava</i>	Yellow Sedge	S5	Secure		x	x
<i>Carex foenea</i>	Fernald's Hay Sedge	S3?	Secure			x
<i>Carex folliculata</i>	Northern Long Sedge	S5	Secure		x	x
<i>Carex gracillima</i>	Graceful Sedge	S4S5	Secure		x	x
<i>Carex gynandra</i>	Nodding Sedge	S5	Secure		x	x
<i>Carex hormathodes</i>	Marsh Straw Sedge	S4S5	Secure		x	
<i>Carex interior</i>	Inland Sedge	S4S5	Secure			x
<i>Carex intumescens</i>	Bladder Sedge	S5	Secure		x	x
<i>Carex lacustris</i>	Lake Sedge	S4	Secure		x	
<i>Carex lasiocarpa</i> var. <i>americana</i>	Slender Sedge	S5	Secure		x	x
<i>Carex lenticularis</i>	Lenticular Sedge	S4	Secure		x	
<i>Carex leptalea</i>	Bristly-stalked Sedge	S5	Secure		x	x
<i>Carex leptonevia</i>	Finely-Nerved Sedge	S5	Secure		x	x
<i>Carex lucorum</i>	Forest Sedge	S4	Secure		x	
<i>Carex lupulina</i>	Hop Sedge	S3	Secure		x	
<i>Carex lurida</i>	Sallow Sedge	S5	Secure		x	
<i>Carex magellanica</i> ssp. <i>irrigua</i>	Boreal Bog Sedge	S5	Secure			x
<i>Carex michauxiana</i>	Michaux's Sedge	S4	Secure		x	x
<i>Carex novae-angliae</i>	New England Sedge	S5	Secure		x	x
<i>Carex oligosperma</i>	Few-Seeded Sedge	S5	Secure			x
<i>Carex paleacea</i>	Chaffy Sedge	S5	Secure		x	
<i>Carex pallescens</i>	Pale Sedge	S5	Secure		x	x
<i>Carex pauciflora</i>	Few-Flowered Sedge	S4S5	Secure			x
<i>Carex pedunculata</i>	Long-stalked Sedge	S4	Secure		x	x
<i>Carex projecta</i>	Necklace Sedge	S5	Secure		x	x
<i>Carex radiata</i>	Eastern Star Sedge	S4	Secure		x	x
<i>Carex scabrata</i>	Rough Sedge	S5	Secure			x
<i>Carex scirpoidea</i>	Scirpuslike Sedge	S2	Sensitive			x
<i>Carex scoparia</i>	Broom Sedge	S5	Secure		x	x
<i>Carex stipata</i>	Awl-fruited Sedge	S5	Secure		x	x
<i>Carex stricta</i>	Tussock Sedge	S5	Secure		x	x
<i>Carex tenera</i>	Tender Sedge	S2	Sensitive		x	
<i>Carex tonsa</i> var. <i>rugosperma</i>	Deep Green Sedge	SNR	Undetermined	ID to sp. probable, not confirmed	x	
<i>Carex tonsa</i> var. <i>tonsa</i>	Shaved Sedge	S5	Secure		x	
<i>Carex torta</i>	Twisted Sedge	S5	Secure		x	x
<i>Carex trisperma</i> var. <i>billingsii</i>	Three-Seed Sedge	S4?	Secure			x
<i>Carex trisperma</i> var. <i>trisperma</i>	Three-seeded Sedge	S5	Secure		x	x
<i>Carex utriculata</i>	Northern Beaked Sedge	S5	Secure		x	x
<i>Carex vesicaria</i>	Inflated Sedge	S4S5	Secure		x	
<i>Carex viridula</i>	Greenish Sedge	S4	Secure			x
<i>Carex wiegandii</i>	Wiegand's Sedge	S3	Sensitive			x

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<i>Cyperus dentatus</i>	Toothed Flatsedge	S4	Secure		x	
<i>Dulichium arundinaceum</i>	Three-Way Sedge	S5	Secure		x	
<i>Eleocharis acicularis</i>	Needle Spikerush	S5	Secure		x	
<i>Eleocharis palustris</i>	Common Spikerush	S5	Secure		x	x
<i>Eleocharis parvula</i>	Dwarf Spikerush	S4	Secure		x	
<i>Eleocharis tenuis</i>	Slender Spikerush	S5	Secure		x	
<i>Eriophorum angustifolium</i>	Narrow-leaved Cottongrass	S5	Secure			x
<i>Eriophorum gracile</i>	Slender Cottongrass	S2	Sensitive			x
<i>Eriophorum tenellum</i>	Rough Cottongrass	S4S5	Secure			x
<i>Eriophorum vaginatum</i> var. <i>spissum</i>	Tussock Cottongrass	S5	Secure			x
<i>Eriophorum virginicum</i>	Tawny Cottongrass	S5	Secure		x	x
<i>Eriophorum viridicarinarum</i>	Green-keeled Cottongrass	S4	Secure			x
<i>Rhynchospora alba</i>	White Beakrush	S5	Secure			x
<i>Rhynchospora capitellata</i>	Small-headed Beakrush	S4	Secure		x	
<i>Rhynchospora fusca</i>	Brown Beakrush	S4	Secure			x
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	S4	Secure		x	
<i>Schoenoplectus maritimus</i>	Saltmarsh Bulrush	S4S5	Secure		x	
<i>Schoenoplectus pungens</i>	Three-square Bulrush	S5	Secure		x	
<i>Schoenoplectus subterminalis</i>	Water Bulrush	S5	Secure		x	x
<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	S5	Secure		x	x
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5	Secure		x	x
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5	Secure		x	x
<i>Trichophorum alpinum</i>	Alpine Clubrush	S4	Secure			x
<i>Trichophorum caespitosum</i>	Tufted Clubrush	S5	Secure			x
POACEAE	GRASSES					
<i>Agrostis capillaris</i>	Colonial Bent Grass	SNA	Exotic		x	x
<i>Agrostis gigantea</i>	Redtop	SNA	Exotic		x	
<i>Agrostis perennans</i>	Upland Bent Grass	S4S5	Secure		x	x
<i>Agrostis scabra</i>	Rough Bent Grass	S5	Secure		x	x
<i>Agrostis stolonifera</i>	Creeping Bent Grass	S5	Secure		x	x
<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	SNA	Exotic		x	x
<i>Brachyelytrum septentrionale</i>	Northern Shorthusk	S5	Secure		x	x
<i>Bromus ciliatus</i>	Fringed Brome	S5	Secure		x	x
<i>Bromus inermis</i>	Smooth Brome	SNA	Exotic		x	
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5	Secure		x	x
<i>Calamagrostis pickeringii</i>	Pickering's Reed Grass	S4S5	Secure			x
<i>Cinna arundinacea</i>	Sweet Wood Reed Grass	S1	May Be At Risk		x	
<i>Cinna latifolia</i>	Drooping Wood Reed Grass	S5	Secure		x	x
<i>Dactylis glomerata</i>	Orchard Grass	SNA	Exotic		x	
<i>Danthonia compressa</i>	Flattened Oat Grass	S5	Secure		x	x
<i>Danthonia spicata</i>	Poverty Oat Grass	S5	Secure		x	x
<i>Deschampsia caespitosa</i>	Tufted Hair Grass	S4	Secure		x	
<i>Deschampsia flexuosa</i>	Wavy Hair Grass	S5	Secure		x	x
<i>Dichanthelium acuminatum</i>	Woolly Panic Grass	S5	Secure		x	
<i>Dichanthelium boreale</i>	Northern Panic Grass	S5	Secure		x	
<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass	S3	Secure		x	
<i>Dichanthelium depauperatum</i>	Starved Panic Grass	S4S5	Secure		x	
<i>Dichanthelium dichotomum</i> / <i>acuminatum</i> var. <i>lindheimeri</i>	panic-grass sp.		[native]		x	
<i>Dichanthelium spretum</i>	Eaton's Witchgrass	S4	Secure		x	
<i>Dichanthelium xanthophyllum</i>	Slender Panic Grass	S1	May Be At Risk		x	
<i>Digitaria ischaemum</i>	Smooth Crab Grass	SNA	Exotic		x	
<i>Distichlis spicata</i>	Salt Grass	S4	Secure		x	
<i>Elymus repens</i>	Quack Grass	SNA	Exotic		x	x

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<i>Elymus trachycaulus</i>	Slender Wild Rye	S4?	Secure			x
<i>Elymus virginicus</i>	Virginia Wild Rye	S5	Secure		x	
<i>Festuca altaica</i>	Northern Rough Fescue	S1	May Be At Risk			x
<i>Festuca filiformis</i>	Hair Fescue	SNA	Exotic		x	
<i>Festuca heteromalla</i>	Spreading Fescue	SNA	Exotic		x	x
<i>Festuca rubra</i>	Red Fescue	S5	Secure		x	x
<i>Festuca subverticillata</i>	Nodding Fescue	S1	May Be At Risk			x
<i>Glyceria borealis</i>	Northern Manna Grass	S5	Secure		x	
<i>Glyceria canadensis</i>	Canada Manna Grass	S5	Secure		x	x
<i>Glyceria striata</i>	Fowl Manna Grass	S5	Secure		x	x
<i>Holcus lanatus</i>	Common Velvet Grass	SNA	Exotic		x	
<i>Hordeum brachyantherum</i>	Meadow Barley	S1	May Be At Risk			x
<i>Leersia oryzoides</i>	Rice Cut Grass	S5	Secure		x	x
<i>Lolium arundinaceum</i>	Tall Fescue	SNA	Exotic		x	
<i>Lolium perenne</i>	Perennial Rye Grass	SNA	Exotic	small-flowered form	x	
<i>Milium effusum var. cisatlanticum</i>	Tall Millet Grass	S4	Secure			x
<i>Muhlenbergia glomerata</i>	Spiked Muhly	S4	Secure	ID uncertain vs. mexicana	x	x
<i>Muhlenbergia uniflora</i>	Bog Muhly	S5	Secure		x	
<i>Oryzopsis asperifolia</i>	White-grained Mountain Rice	S5	Secure		x	
<i>Panicum capillare</i>	Common Witch Grass	SNA	Exotic		x	
<i>Panicum dichotomiflorum</i>	Fall Panic Grass	S5	Secure		x	
<i>Panicum virgatum var. spissum</i>	Switch Grass	S4	Secure		x	
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5	Secure		x	
<i>Phleum pratense</i>	Common Timothy	SNA	Exotic		x	x
<i>Poa alsodes</i>	Grove Blue Grass	S4	Secure			x
<i>Poa annua</i>	Annual Blue Grass	SNA	Exotic		x	x
<i>Poa compressa</i>	Canada Blue Grass	SNA	Exotic		x	x
<i>Poa glauca</i>	Glaucous Blue Grass	S2S3	Sensitive			x
<i>Poa nemoralis</i>	Wood Blue Grass	SNA	Exotic		x	
<i>Poa palustris</i>	Fowl Blue Grass	S5	Secure		x	x
<i>Poa pratensis</i>	Kentucky Blue Grass	S5	Secure		x	x
<i>Poa saltuensis</i>	Weak Blue Grass	S5	Secure			x
<i>Poa trivialis</i>	Rough Blue Grass	SNA	Exotic		x	x
<i>Puccinellia americana</i>	Seaside Alkali Grass	S4S5	Secure		x	
<i>Puccinellia distans</i>	Spreading Alkali Grass	SNA	Exotic		x	
<i>Puccinellia tenella</i>	Tundra Alkali Grass	S5	Secure		x	
<i>Schizachne purpurascens</i>	Purple Oat Grass	S4	Secure			x
<i>Setaria glauca</i>	Yellow Foxtail	SNA	Exotic		x	
<i>Setaria viridis</i>	Green Foxtail	SNA	Exotic		x	
<i>Spartina alterniflora</i>	Smooth Cord Grass	S5	Secure		x	
<i>Spartina patens</i>	Saltmeadow Cord Grass	S5	Secure		x	
<i>Spartina pectinata</i>	Prairie Cord Grass	S5	Secure		x	
<i>Sphenopholis intermedia</i>	Slender Wedge Grass	S4	Secure			x
<i>Sporobolus vaginiflorus</i>	Sheathed Dropseed	SNA	Exotic		x	
<i>Torreyochloa pallida var. fernaldii</i>	Pale False Manna Grass	S4S5	Secure		x	
<i>Trisetum spicatum</i>	Narrow False Oats	S3S4	Secure			x
SPARGANIACEAE BUR-REEDS						
<i>Sparganium americanum</i>	American Burreed	S5	Secure	ID to sp. probable, not confirmed	x	
<i>Sparganium angustifolium</i>	Narrow-leaved Burreed	S5	Secure		x	x

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<i>Sparganium emersum</i>	Green-fruited Burreed	S5	Secure	ID to sp. probable, not confirmed	x	x
<i>Sparganium fluctuans</i>	Floating Burreed	S4	Secure		x	
TYPHACEAE	CATTAILS					
<i>Typha angustifolia</i>	Narrow-Leaved Cattail	S5	Secure	possibly T. x glauca	x	
<i>Typha latifolia</i>	Broad-leaved Cattail	S5	Secure		x	
PONTEDERIACEAE	PICKERELWEEDS					
<i>Pontederia cordata</i>	Pickernelweed	S5	Secure		x	
LILIACEAE	LILIES					
<i>Asparagus officinalis</i>	Garden Asparagus	SNA	Exotic		x	
<i>Clintonia borealis</i>	Yellow Bluebead Lily	S5	Secure		x	x
<i>Convallaria majalis</i>	European Lily-of-the-Valley	SNA	Exotic		x	
<i>Hemerocallis fulva</i>	Orange Day Lily	SNA	Exotic		x	
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	S5	Secure		x	x
<i>Maianthemum racemosum</i>	Large False Solomon's Seal	S4S5	Secure		x	x
	Starry False Solomon's Seal					
<i>Maianthemum stellatum</i>	Starry False Solomon's Seal	S4	Secure			x
<i>Maianthemum trifolium</i>	Three-leaved False Solomon's Seal	S5	Secure		x	x
<i>Medeola virginiana</i>	Indian Cucumber Root	S5	Secure		x	
<i>Polygonatum pubescens</i>	Hairy Solomon's Seal	S4S5	Secure		x	
<i>Streptopus amplexifolius</i>	Clasping-leaved Twisted-stalk	S4S5	Secure			x
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	S5	Secure		x	x
<i>Trillium cernuum</i>	Nodding Trillium	S4	Secure		x	x
<i>Trillium undulatum</i>	Painted Trillium	S5	Secure		x	
<i>Uvularia sessilifolia</i>	Sessile-leaved Bellwort	S4S5	Secure		x	
IRIDACEAE	IRISES					
<i>Iris versicolor</i>	Harlequin Blue Flag	S5	Secure		x	x
	Narrow-leaved Blue-eyed-grass					
<i>Sisyrinchium angustifolium</i>	Narrow-leaved Blue-eyed-grass	S4	Secure		x	
<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass	S3S4	Secure		x	
<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	S5	Secure		x	x
ORCHIDACEAE	ORCHIDS					
<i>Arethusa bulbosa</i>	Arethusa	S4	Secure			x
<i>Coeloglossum viride var. virescens</i>	Long-bracted Frog Orchid	S2S3	May Be At Risk			x
<i>Corallorhiza maculata</i>	Spotted Coralroot	S4	Secure			x
<i>Cypripedium acaule</i>	Pink Lady's-Slipper	S5	Secure		x	
<i>Epipactis helleborine</i>	Helleborine	SNA	Exotic		x	
<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	S3	Sensitive			x
	Checkered Rattlesnake-Plantain					
<i>Goodyera tessellata</i>	Checkered Rattlesnake-Plantain	S4	Secure		x	
<i>Listera convallarioides</i>	Broad-Leaved Twayblade	S4	Secure			x
<i>Platanthera aquilonis</i>	Tall Northern Green Orchid	S4?	Secure			x
<i>Platanthera blephariglottis</i>	White Fringed Orchid	S4	Secure			x
<i>Platanthera clavellata</i>	Club Spur Orchid	S5	Secure		x	x
<i>Platanthera dilatata</i>	White Bog Orchid	S4S5	Secure			x
<i>Platanthera flava</i>	Southern Rein-Orchid	S2	Sensitive		x	
<i>Platanthera lacera</i>	Ragged Fringed Orchid	S4S5	Secure		x	x
<i>Platanthera obtusata</i>	Blunt-leaved Orchid	S4	Secure		x	
<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	S4	Secure		x	x
<i>Pogonia ophioglossoides</i>	Rose Pogonia	S4	Secure			x

Appendix 2. Breeding bird species recorded during Polletts Cove – Blair River and LaHave River plant surveys, with provincial status (see Methods) and breeding evidence. Possible Breeding: H = adult in suitable nesting habitat; S = singing male in suitable nesting habitat. Probable Breeding: P = Pair in suitable nesting habitat; A = agitated behaviour. Confirmed Breeding: FY = flightless or dependent young; DD = distraction display; AE = adult entering presumed nest site; CF = adult carrying food.

Species	Common Name	S-rank	GS Rank	Polletts		LaHave	
				Br.Ev.	#rec	Br.Ev.	#rec
<i>Pandion haliaetus</i>	Osprey	S5B	Secure			H	2
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S4	Secure			H	2
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	Secure	H	1		
<i>Falco sparverius</i>	American Kestrel	S5B	Secure	H	1		
<i>Falco columbarius</i>	Merlin	S5B	Secure	A	1	H	2
<i>Bonasa umbellus</i>	Ruffed Grouse	S4S5	Secure	S	1		
<i>Tringa melanoleuca</i>	Greater Yellowlegs	S3B,S5M	Sensitive	A	1		
<i>Actitis macularius</i>	Spotted Sandpiper	S3S4B	Sensitive	H	1	FY	7
<i>Gallinago delicata</i>	Wilson's Snipe	S3S4B	Sensitive	H	1		
<i>Scolopax minor</i>	American Woodcock	S4S5B	Secure	H	1		
<i>Columba livia</i>	Rock Pigeon	SNA	Exotic			AE	2
<i>Zenaida macroura</i>	Mourning Dove	S5	Secure			S	2
<i>Chordeiles minor</i>	Common Nighthawk	S3B	At Risk			H	3
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B	Secure	H	1	H	3
<i>Megaceryle alcyon</i>	Belted Kingfisher	S5B	Secure	H	1	P	4
<i>Picoides pubescens</i>	Downy Woodpecker	S5	Secure			H	3
<i>Picoides villosus</i>	Hairy Woodpecker	S5	Secure			H	2
<i>Colaptes auratus</i>	Northern Flicker	S5B	Secure	H	1	H	2
<i>Contopus virens</i>	Eastern Wood-Pewee	S3S4B	Sensitive			S	16
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S3S4B	Sensitive	H	1		
<i>Empidonax minimus</i>	Least Flycatcher	S4B	Secure	H	1	P	2
<i>Tachycineta bicolor</i>	Tree Swallow	S4B	Sensitive	P	1		
<i>Riparia riparia</i>	Bank Swallow	S3B	May Be At Risk	P	1		
<i>Hirundo rustica</i>	Barn Swallow	S3B	At Risk			FY	3
<i>Cyanocitta cristata</i>	Blue Jay	S5	Secure			P	3
<i>Corvus brachyrhynchos</i>	American Crow	S5	Secure			P	2
<i>Corvus corax</i>	Common Raven	S5	Secure			H	2
<i>Poecile atricapilla</i>	Black-capped Chickadee	S5	Secure			P	2
<i>Poecile hudsonica</i>	Boreal Chickadee	S3	Sensitive	H	1		
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S4	Secure			H	2

Species	Common Name	S-rank	GS Rank	Polletts		LaHave	
				Br.Ev.	#rec	Br.Ev.	#rec
<i>Certhia americana</i>	Brown Creeper	S5	Secure			H	3
<i>Catharus ustulatus</i>	Swainson's Thrush	S4S5B	Secure	H	1		
<i>Catharus guttatus</i>	Hermit Thrush	S5B	Secure	CF	2		
<i>Turdus migratorius</i>	American Robin	S5B	Secure	S	1	H	2
<i>Dumetella carolinensis</i>	Gray Catbird	S3B	May Be At Risk			S	2
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B	Secure	H	1	H	1
<i>Sturnus vulgaris</i>	European Starling	SNA	Exotic			H	1
<i>Vireo solitarius</i>	Blue-headed Vireo	S5B	Secure			S	2
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B	Secure	P	2	S	3
<i>Vermivora peregrina</i>	Tennessee Warbler	S3S4B	Sensitive	S	1		
<i>Parula americana</i>	Northern Parula	S5B	Secure			FY	1
<i>Dendroica magnolia</i>	Magnolia Warbler	S5B	Secure	H	1		
<i>Dendroica coronata</i>	Yellow-rumped Warbler	S5B	Secure	S	1	H	1
<i>Dendroica fusca</i>	Blackburnian Warbler	S4B	Secure	CF	1		
<i>Mniotilta varia</i>	Black-and-White Warbler	S4S5B	Secure	CF	1		
<i>Setophaga ruticilla</i>	American Redstart	S5B	Secure	CF	2	P	2
<i>Seiurus aurocapilla</i>	Ovenbird	S5B	Secure	H	1	AE	2
<i>Seiurus noveboracensis</i>	Northern Waterthrush	S4B	Secure	H	1		
<i>Oporornis philadelphia</i>	Mourning Warbler	S4B	Secure	CF	1		
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B	Secure	DD	1	H	2
<i>Spizella passerina</i>	Chipping Sparrow	S4S5B	Secure	FY	1		
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B	Secure	S	1		
<i>Melospiza melodia</i>	Song Sparrow	S5B	Secure	S	1	S	3
<i>Melospiza lincolni</i>	Lincoln's Sparrow	S4B	Secure	A	1		
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B	Secure	S	1	S	2
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B	Secure	A	2		
<i>Junco hyemalis</i>	Dark-eyed Junco	S4S5	Secure	S	1	FY	1
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4S5B	Secure			P	1
<i>Quiscalus quiscula</i>	Common Grackle	S5B	Secure			H	1
<i>Carpodacus purpureus</i>	Purple Finch	S4S5	Secure	S	1	H	1
<i>Carduelis pinus</i>	Pine Siskin	S3S4B,S5N	Sensitive	FY	1		
<i>Carduelis tristis</i>	American Goldfinch	S5	Secure			H	3
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	S4B,S5N	Secure	H	1		

