



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

DOCUMENTING CALCAREOUS HABITATS OF HIGH CONSERVATION VALUE IN NORTHERN RIVER VALLEYS

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EXECUTIVE SUMMARY

River valleys are especially diverse portions of any landscape because of their diversity of moisture, exposure and disturbance regimes. In highly altered landscapes, river valleys also often retain the most natural communities because of inherent difficulties in farming, logging and settling their steep slopes and flood-prone bottomlands. Because soils with higher pH values (i.e. alkaline, basic or calcareous soils) are generally much more fertile than acidic ones and often support species-rich communities, river valleys underlain by alkaline bedrock often constitute particularly significant reservoirs of biodiversity.

In New Brunswick, high-pH habitats (including alkaline bedrock outcrops, cliffs, fens and swamps) represent a small portion of the provincial land area, often occurring as small islands within a predominantly acidic landscape. These habitats support many of the province's rarest vascular plant, lichen and bryophyte species and represent areas of high conservation significance. Due to lack of connectivity and relative isolation, species of conservation concern found in these habitats may be at greater risk of local extirpation due to human disturbance or stochastic events, as recruitment and recolonization from other populations is unlikely. Furthermore, calcareous upland and wetland habitats are underrepresented in the province's network of protected areas and some of the communities they support may therefore be under greater threat.

The central and eastern portions of Restigouche County, in New Brunswick's Northern Uplands Ecoregion, hold some of the most significant concentrations of high-pH habitats in the province, mainly found where bedrock is exposed on steep ravine slopes and river shores. Due to northern New Brunswick's more rugged topography, settlement and agriculture have had a relatively small impact in the region and several of its river valleys have remained largely intact, aside from impacts of historical logging and log driving, and recent industrial wood harvesting and silviculture.

With funding from the New Brunswick Wildlife Trust Fund and Environment and Climate Change Canada's Atlantic Ecosystems Initiative program, the Atlantic Canada Conservation Data Centre expanded on previous fieldwork carried out along northern New Brunswick rivers over the last two decades. Over two weeks in late July and late August 2018, we devoted the equivalent of 56 person days to biological inventories in 13 northern New Brunswick calcareous ravines and river valleys focused on vascular plants, lichens and bryophytes. The project's object was to discover and precisely document rare species populations and rare plant communities in order to: (1) identify areas of high conservation value, and (2) improve understanding of the provincial status of rare species and communities.

Our fieldwork was highly successful, discovering 1,369 locations of 124 taxa of conservation concern in New Brunswick (57 vascular plants, 35 macrolichens, 23 bryophytes and nine birds), including 58 location records for 26 Critically Imperiled species, 181 location records for 31 Imperiled species, and 1,130 location records for 68 Vulnerable species. Across all survey sites, we documented over 7,700 species occurrence records.

We documented several very significant finds for New Brunswick, including the discovery of one vascular plant and eight lichens not previously known to occur in the province: Inland Bluegrass

(*Poa interior*), Thick-branched Rockshag Lichen (*Ephebe solida*), Lesser Eye Shadow Lichen (*Phaeophyscia decolor*), Schrader's Jellyskin Lichen (*Leptogium schraderi*), Lesser Rockbud Lichen (*Euopsis granatina*), Rock Hairball Lichen (*Spilonema revertens*), Rockvelvet Lichen (*Thermutis velutina*), Rimmed Cobblestone Lichen (*Acarospora glaucocarpa*) and a jellyskin lichen with no recognized common name (*Leptogium massiliense*). Other highlights included additional records of five species first discovered in New Brunswick through AC CDC fieldwork in 2017: Northern Holly Fern (*Polystichum lonchitis*), Large-leaved Sandwort (*Moehringia macrophylla*), Thread Lichen (*Ephebe perspinulosa*), Soil Tarpaper Lichen (*Collema tenax*), Forty-five Jellyskin Lichen (*Leptogium intermedium*).

Precise documentation of rare species and communities has allowed for the fine-scale identification of several areas of conservation significance representing potential future targets for protected area designation, especially in the Upsalquitch River and Charlo River watersheds and particularly in the South Charlo River gorge. Surveys in 2017 and 2018 reveal that this area holds one of the most significant rare species concentrations in New Brunswick and supports the only known provincial occurrences of two vascular plants (Inland Bluegrass and Northern Holly Fern) and one lichen (Forty-five Jellyskin Lichen).

The significant amount of occurrence data collected through this project has improved our understanding of the true status of many rare species and communities in the province and has greatly informed ongoing species rank reassessments. This will in turn make a significant contribution in focusing conservation action on species and areas most in need of protection.

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BACKGROUND & RATIONALE

River valleys are especially diverse portions of any landscape because of their diversity of moisture, exposure and disturbance regimes. In highly altered landscapes, river valleys also often retain the most natural communities because of difficulties inherent in farming, logging and settling their steep slopes and flood-prone bottomlands. Due to northern New Brunswick's more rugged topography, settlement and agriculture have had a relatively small impact in the region and several of its river valleys have remained largely intact, aside from impacts of historical logging and log driving, and recent industrial wood harvesting and silviculture.

Where watersheds are underlain by alkaline bedrock, river valleys often constitute particularly significant reservoirs of biodiversity. Along with hydrology, soil pH is one of the most important factors governing the occurrence of plant species and communities. Soils with higher pH values (i.e. alkaline, basic or calcareous soils) are generally much more fertile than acidic ones, and often support species-rich communities, constituting biodiversity hotspots. Conditions suitable to support calciphilic plant communities generally occur in two types of situations: (1) where high-pH bedrock is exposed (cliffs, outcrops, deeply incised ravines, etc.) or where shallow soils are underlain by high-pH bedrock (e.g. rich upland hardwoods underlain by limestone) and (2) where significant groundwater seepage through high-pH bedrock brings nutrient-rich alkaline water to the surface, forming calcareous swamps and fens.

Over 400 of New Brunswick's native vascular plant species, representing ~35% of the province's total flora, show at least some affinity for calcareous conditions (Blaney 2015, unpublished analysis; AC CDC 2018). These include roughly 270 species of conservation concern, nearly 200 of which are considered Critically Imperiled (S1) or Imperiled (S2) (see Appendices 1 and 2 for status rank definitions) in the province. Many of New Brunswick's rarest species occur exclusively in high-pH habitats, meaning that these areas are particularly significant for conservation.

In New Brunswick, high-pH habitats represent a very small portion of the total provincial land area, and most often occur as small islands within a predominantly acidic landscape. Due to lack of connectivity and relative isolation, species of conservation concern found in these habitats are at greater risk of local extirpation due to human disturbance or stochastic events, as recruitment and recolonization from other populations is unlikely. Furthermore, calcareous upland and wetland habitats are underrepresented in the province's network of protected areas and some of the communities they support may therefore be under greater threat.

The central and eastern portions of Restigouche County, in New Brunswick's Northern Uplands Ecoregion, hold some of the most significant concentrations of high-pH habitats in the province, mainly found where bedrock is exposed on steep ravine slopes and river shores. The region has a varied geology, characterized by a complex mosaic of volcanic rock, carbonate sedimentary rock, and deep- and shallow-water clastic sedimentary rock (Fyffe and Richard 2007, GSC 2019, NB DERD 2019). Several of the bedrock formations most prevalent in the area include moderately to highly alkaline components. While the region's large canoeable rivers (Restigouche, Kedgwick and Upsalquitch) have received considerable survey attention in the past and are well known as calciphilic

species hotspots, numerous smaller and less accessible river sections and brook valleys have never been explored by professional naturalists.

With project funding from Environment and Climate Change Canada's Atlantic Ecosystems Initiative fund and the New Brunswick Wildlife Trust Fund in 2018, the Atlantic Canada Conservation Data Centre (AC CDC) expanded on previous fieldwork carried out along northern New Brunswick rivers over the last two decades, conducting botanically-focused biological inventories in thirteen river and brook valleys of central and eastern Restigouche County. The objective of this project was to discover and precisely document rare vascular plant populations and rare plant communities in order to (1) identify areas of high conservation value and (2) improve our understanding of the provincial status of rare species and communities through the enhancement of the AC CDC's species occurrence dataset.

METHODS

Prior to fieldwork, relatively intact river and brook valleys potentially containing alkaline bedrock exposures were identified in central and eastern Restigouche County based on geological mapping and aerial photography, used in combination with AC CDC rare species data to ensure that sites had not previously been extensively covered. Documented calciphilic plant occurrences were also used as indicators of high-pH habitats to identify higher-priority areas for survey.

During the weeks of July 24th to 27th and August 21st to 24th, biological surveys were carried out by AC CDC botanists Sean Blaney, David Mazerolle and Colin Chapman, E.C. Smith Herbarium botanist Alain Belliveau and freelance bryologist / lichenologist Tom Neily. The fieldwork team devoted the equivalent of roughly 56 person days (including travel and overtime, conservatively estimated) to surveys focused on documenting plant and lichen biodiversity and ecological communities of conservation concern. Surveys were carried out in thirteen river and brook valleys: (1) Whites Brook (upper section and lower section), (2) Lower Grindstone Brook, (3) Cheuters Brook, (4) Jardine Brook, (5) Grog Brook, (6) the Northwest Upsalquitch River, (7) Narrows Brook, (8) the Charlo River, (9) the South Charlo River, (10) the South Branch Benjamin River, (11) Louison Brook, (12) Lower McNair Brook and (13) Upper McNair Brook. Figure 1 shows the location of surveyed sites.

During fieldwork, botanists focused on areas with higher potential to support provincially rare species or ecological communities (with particular attention to steep slopes with high-pH bedrock exposures, rich floodplains and old forest), but generally sampled all habitat types within survey areas. Site coverage was precisely documented by GPS units set to record track point locations at 10 to 15 second intervals. Surveyors collectively travelled roughly 290 km on foot during the project. Survey coverage is precisely illustrated in *Site Summaries*.

We compiled full vascular plant species lists for each survey site, assigning general descriptions of species' abundance within a surveyed area as follows: *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. For any provincially rare species encountered during surveys (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; see Appendix 1 for rank definitions), we recorded precise locations by GPS (accurate to 10 m or less), along with information on population size and extent, habitat and associated species. Individuals or patches separated from others by 10 m or more were considered distinct locations and were generally recorded separately. Most rare species populations were also documented by voucher specimens that will be deposited at the New Brunswick Museum in Saint John, the Connell Memorial Herbarium - University of New Brunswick in Fredericton, the E.C. Smith Herbarium - Wolfville Nova Scotia, the Agriculture and Agri-Food Canada Collection of Vascular Plants - Ottawa and the Canadian Museum of Nature - Ottawa.

In addition to vascular plant occurrence data, general notes were taken on significant ecological communities represented within survey sites, with more detailed data collected for provincially rare communities, including old growth forest. Macrolichens were also considered an important target during fieldwork, although level of survey effort for these taxa varied considerably between sites. Freelance bryologist / lichenologist Tom Neily focused his efforts solely on documenting bryophytes and lichens, in complement to the observations of other surveyors who generally had a broader focus including vascular plants, lichens, ecological communities and animals. Breeding bird species, particularly those considered to be of conservation concern, were incidentally documented with breeding evidence recorded using the methods of the Maritimes Breeding Bird Atlas (<http://www.mba-aom.ca>).

All data collected and compiled through this project were digitized and standardized for incorporation into the AC CDC's geo-referenced species occurrence database, where they will be permanently maintained and will inform future conservation and land use decisions.

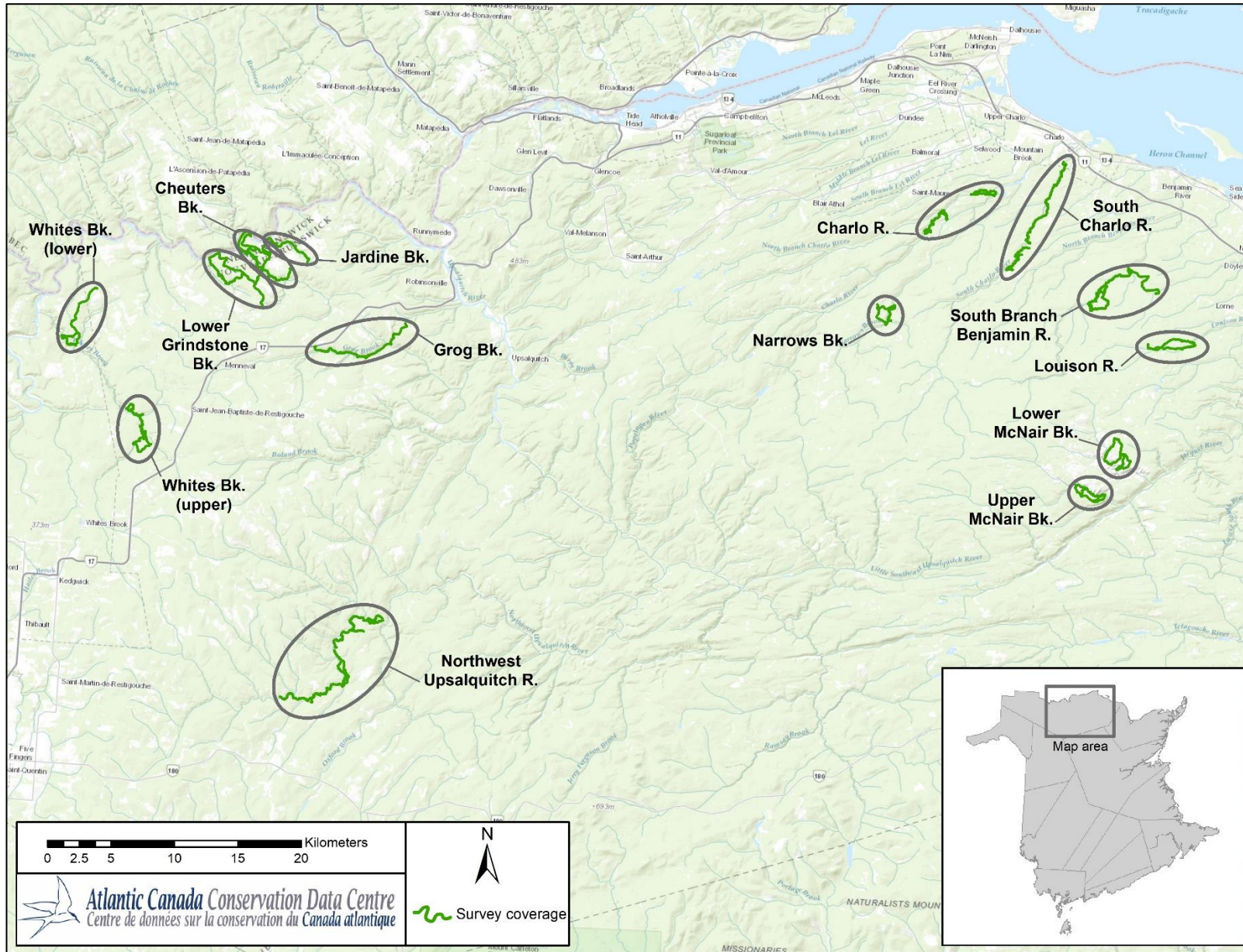


Figure 1. Location of project survey sites, in central and eastern Restigouche County, New Brunswick. Dark green lines represent GPS track logs recorded during fieldwork. Topographical mapping from Esri's World Topographic Map, 2019.

RESULTS

SPECIES OF CONSERVATION CONCERN

We discovered 1,369 locations for 124 different provincially rare species or subspecies, including 26 Critically Imperiled (S1) taxa, 31 Imperiled (S2 and S2S3) taxa, and 68 Vulnerable (S3 and S3S4) taxa (Table 1; see Appendix 1 for status rank definitions). Species of conservation concern documented during surveys include 57 vascular plants, 35 lichens, 23 bryophytes and nine birds.

All but five of the 57 documented vascular plant taxa of conservation concern are considered moderately to highly calciphilic, and roughly two thirds of these are entirely restricted to alkaline habitats in the province.

Total rare species richness by site ranged from 11 to 50, averaging approximately 23 species (median of 21) across all sites (Table 1; see also *Site Summaries* below). Rare vascular plant species richness varied from four to 24 species, averaging 11. The highest numbers of provincially rare species were documented along the Northwest Upsalquitch River (50 spp.), the South Charlo River (38 spp.) and the Charlo River (46 spp.). These three sites, which represent the largest watercourses surveyed through this project, received the most extensive search effort and benefitted from a more diversified survey coverage with a greater focus on lichens and bryophytes. Documented richness of rare vascular plant species largely follows the same pattern, with highest numbers also recorded on the Northwest Upsalquitch River (24 spp.), South Charlo River (22 spp.) and Charlo River (15 spp.).

Discussion on the rarest and most significant species of conservation concern recorded during our fieldwork is presented below. Details provided on the distribution and range of these species were obtained from ACCDC (2019), CESC (2015), NatureServe (2019), CNALH (2019) and CNABH (2019). Due to the more cryptic nature of lichens and bryophytes, knowledge of their distribution and status is often much more limited than is the case for vascular plants. As a result, status ranks assigned to lichen and bryophyte taxa often reflect a lack of search effort and are generally more likely to change drastically with increased surveying than those of vascular plants.

The following species of conservation concern represent this project's most provincially significant finds:

Inland Bluegrass (*Poa interior*; S1? – Critically Imperiled; Figure 23E): This native bluegrass ranges throughout much of North America's boreal region from Alaska to Quebec and occurs in low alpine habitats of the Rocky Mountains as far south as Arizona and New Mexico. It is known to grow in a variety of dry to mesic habitats but appears to be mainly associated with high-pH bedrock in northeastern parts of its range. Our discovery of a very small population of Inland Bluegrass on an alkaline bedrock outcrop along the South Charlo River represents the first documentation of this species in Atlantic Canada. The nearest known populations are situated at scattered locations in the Gaspé Peninsula, along Quebec's North Shore, and in northern Vermont. Though the species is rather distinctive, it may easily be overlooked, as its detection requires considerable experience with regional bluegrasses. It is therefore quite possible that Inland Bluegrass is present elsewhere in New Brunswick's northern calcareous river valleys.

Thick-branched Rockshag Lichen (*Ephebe solida*, S1? – Critically Imperiled): This endemic North American macrolichen typically occurs on damp calcareous rock. Until 2016, when it was discovered in western Ontario, the species was known in Canada only from a single 1939 collection from northern Quebec. Bryologist / lichenologist Tom Neily collected Thick-branched Rockshag Lichen during our surveys on the South Branch Benjamin River for the first documentation in the Maritimes and, based on the CNALH (2019), the third collection of the species in Canada. The uncertainty associated with the status rank (S1?) reflects its cryptic nature and the likelihood that it may be overlooked or misidentified.

Lesser Eye Shadow Lichen (*Phaeophyscia decolor*, S1 – Critically Imperiled): This largely saxicolous lichen is widespread throughout western North America and apparently scattered across northeastern regions, with a small number of occurrences documented in Ontario, Quebec and New England. Tom Neily discovered the species on an alkaline bedrock outcrop during our surveys in the South Branch Benjamin River valley. Prior to this project, Lesser Eye Shadow Lichen had never been reported from the Maritimes.

Schrader's Jellyskin Lichen (*Leptogium schraderi*, S1 – Critically Imperiled): The North American distribution of Schrader's Jellyskin Lichen is mainly restricted to northern and western regions from Nunavut to Alaska and south to Oregon. Outside of these regions, the species is only known from a few highly disjunct populations in the Maritimes, where it occurs on exposed calcareous rock. Prior to this project, the species' known distribution in the Maritimes was limited to two gypsum sites in Nova Scotia. The first confirmed New Brunswick occurrence of Schrader's Jellyskin Lichen was discovered by Tom Neily during our 2018 surveys on the South Charlo River.

Lesser Rockbud Lichen (*Euopsis granatina*, S1? – Critically Imperiled): This mainly boreal and arctic lichen species is known in North America from a limited number of widespread collections from Alaska to Greenland and south at least to Colorado and New England. It appears to be rare throughout its range but may be overlooked. In the Maritimes, the species was previously only known from Nova Scotia, where it is considered Critically Imperiled. During our surveys, Lesser Rockbud Lichen was collected by Tom Neily from a calcareous outcrop along the upper section of Whites Brook.

Rock Hairball Lichen (*Spilonema revertens*, S1? – Critically Imperiled): Rock Hairball Lichen is widespread throughout North America, including most Canadian provinces and territories, though its Canadian distribution is patchy. It is considered of conservation concern over most of its range and typically occurs on calcareous substrates. It had never been documented in New Brunswick prior to our project. As with Lesser Rockbud Lichen, Rock Hairball Lichen was collected from a bedrock outcrop in the upper section of Whites Brook.

Rockvelvet Lichen (*Thermutis velutina*, S1? – Critically Imperiled): Rockvelvet Lichen is widespread in North American but only known from a small number of collections, and its distribution and status are not well understood. In Canada, the species had only been reported from British Columbia, Ontario and Quebec. A single occurrence of Rockvelvet Lichen was discovered during this project by Tom Neily on a calcareous rock outcrop along the Charlo River. This represents the first documented record for the species in Atlantic Canada.

Rimmed Cobblestone Lichen (*Acaropsora revertens*, SU – Unknown): This saxicolous lichen is very widespread across the northern temperate and arctic zones. As with many crustose lichens, its exact status and distribution are poorly understood at present. Prior to this project, Rimmed Cobblestone Lichen had never been documented in the Maritimes, although it was known from nearby sites in the Gaspé Peninsula. Tom Neily collected the species at three of our survey sites during the project (Northwest Upsalquitch River, South Branch Benjamin River and Upper McNair Brook), suggesting the species is likely locally common in northern New Brunswick.

A jellyskin lichen (*Leptogium massiliense*, SU – Unknown): Little is known of this very rare or underreported jellyskin lichen. Online sources and peer-reviewed publications indicate the species is mostly European in distribution, with only two previously-known collections from North America in British Columbia and the state of Washington. A specimen of this cryptic species was collected from a calcareous outcrop during our surveys along the Northwest Upsalquitch River. Its reported affinity for calcareous rock suggests the species could be rare.

Northern Holly Fern (*Polystichum lonchitis*, S1 – Critically Imperiled; figures 23C and 23D): Northern Holly Fern, an attractive evergreen species, has a wide but discontinuous North American range made up of several disjunct regions including the Western Cordillera, the Great Lakes, the eastern Quebec and Atlantic region, and Greenland. It is absent from New England and rare throughout the eastern part of its range, considered Vulnerable in Quebec and Newfoundland, Imperiled in Nova Scotia, and Critically Imperiled in New Brunswick and Labrador. In the Maritimes, Northern Holly Fern is known from several river and brook ravines in northern Cape Breton, Nova Scotia, but was only first reported from New Brunswick in 2017, when a small occurrence was discovered through AC CDC fieldwork on the South Charlo River. In 2018, our surveys discovered an additional small occurrence on a steep calcareous semi-forested slope along the South Charlo River. This river remains the only site known to support Northern Holly Fern in New Brunswick.

Thread Lichen (*Ephebe perspinulosa*, S1 – Critically Imperiled): The known Canadian distribution of this cryptic macrolichen is limited to Ontario, where its status is unknown, and a few sites in Nova Scotia and New Brunswick, where it is considered Critically Imperiled. The species was first documented in New Brunswick through AC CDC fieldwork along the South Charlo River in 2017. A second New Brunswick occurrence was documented along the South Branch Benjamin River in 2018. However, the identification of the specimen collected at this location is tentative and will require expert review to confirm.

Soil Tarpaper Lichen (*Collema tenax*, S1 – Critically Imperiled): Though widespread and fairly common throughout much of North America, Soil Tarpaper Lichen is apparently quite rare in the northeast. The species is considered Critically Imperiled in New Brunswick, Critically Imperiled to Vulnerable in Newfoundland, and Vulnerable in Quebec and Nova Scotia. It is not known to be present in Prince Edward Island and Labrador. Soil Tarpaper Lichen was first documented in New Brunswick by bryologist / lichenologist Tom Neily through AC CDC fieldwork in 2017, when it was collected from exposed gypsum outcrops at Plaster Rock. Through this project, we discovered two additional occurrences for the province along the Northwest Upsalquitch and South Charlo rivers.

Forty-five Jellyskin Lichen (*Leptogium intermedium*, S1 – Critically Imperiled): The known distribution of this small macrolichen is mostly concentrated in the Western Cordillera, with disjunct

occurrences scattered eastward to the Atlantic Region. In eastern Canada, the species is only known from Ontario, New Brunswick and Nova Scotia, and is considered Critically Imperiled in each province. It was first documented in New Brunswick in 2017 by bryologist / lichenologist Tom Neily through AC CDC fieldwork along the South Charlo River. In 2018, we documented the species at eight additional locations in the same river gorge.

Rooftop Leskea Moss (*Pseudoleskeella tectorum*, S1 – Critically Imperiled): Though widespread in western and northern North America, Rooftop Leskea Moss is apparently extremely rare in the Maritimes. Its entire distribution in the Maritimes was limited to a single location in northern New Brunswick in Sugarloaf Provincial Park. A second Maritimes location for Rooftop Leskea Moss was discovered during this project on an alkaline bedrock outcrop in the South Charlo River gorge.

Large-leaved Sandwort (*Moehringia macrophylla*, S1 – Critically Imperiled; figures 5C and 27F): This small mainly boreal and western montane species of the Pink family (Caryophyllaceae) is uncommon throughout much of its North American range. The species is rare to extremely rare in every jurisdiction where it occurs in central and eastern North America, from Saskatchewan east to Quebec, Labrador and New Brunswick, Vermont, Massachusetts and Connecticut. Its distribution in the region suggests a strong affinity for exposed alkaline bedrock, especially serpentine. Large-leaved Sandwort was only first discovered in the Maritimes in 2017, when AC CDC fieldwork documented a few occurrences on the South Charlo River and the Upper South Branch Jacquet River. Our surveys in 2018 resulted in the documentation of small occurrences on alkaline outcrops along Whites Brook (3 locations), the South Branch Benjamin River (1 location) and the Louison River (2 locations). The known Maritimes distribution of this species remains entirely restricted to calcareous ravines in Restigouche County.

Northern Arnica (*Arnica lonchophylla*, S1 – Critically Imperiled; Figure 15B): A small to medium-sized yellow-flowered plant of the Aster family (Asteraceae), Northern Arnica is strongly associated with open habitats of calcareous bedrock and high-pH soils. The species is mainly northern in its distribution, ranging across much of Canada's boreal zone, with a few more southern occurrences. It is largely absent from the contiguous United States except for a few mid-western and western states near the Canadian border. Largely due to its close association to high-pH habitats, the species is rare to extremely rare from Ontario eastward. It is extremely rare in the Maritimes, only known from a small number of river valleys in northern New Brunswick and northern Cape Breton, Nova Scotia. Our fieldwork discovered Northern Arnica occurrences on alkaline bedrock outcrops along both the Northwest Upsalquitch River (9 locations) and the Charlo River (1 location). Prior to this project, the species was only known from three sites in the province, one of which had been discovered on the South Charlo River through AC CDC fieldwork in 2017.

Purple-stemmed Gentian (*Gentiana rubricaulis*, S1 – Critically Imperiled; Figure 15C): An attractive purple-flowered perennial, Purple-stemmed Gentian is endemic to a restricted portion of central and eastern North America, mostly limited to Ontario, Manitoba and the western Great Lakes (Minnesota, Wisconsin and Michigan), with disjunct occurrences found to the southwest in Nebraska and to the east in Maine and New Brunswick. Throughout its range, the species occurs in a variety of moist alkaline habitats including fens, swamps, marshes, shores and riparian meadows. Prior to this project, the known distribution of Purple-stemmed Gentian in New Brunswick was limited to a small

number of sites in Charlotte County. We documented a single small occurrence of the species along the shores of the Northwest Upsalquitch River, greatly extending its known provincial range.

Common Butterwort (*Pinguicula vulgaris*, S1 – Critically Imperiled; Figure 8E): Common Butterwort is a small calciphilic carnivorous plant of boreal affinity with a wide distribution ranging across northern North America. It is largely absent from the contiguous United States, reaching its southern limits in the Great Lakes states and northern New England. The species is considered Critically Imperiled in New Brunswick, Imperiled in Nova Scotia, and does not occur on Prince Edward Island. In New Brunswick, Common Butterwort is entirely restricted to calcareous outcrops and shores along a 30 km section of the Restigouche River. In 2018, we documented the species at one location on the Restigouche River near the mouth of Jardine Brook, roughly 500 meters from a previously known occurrence.

Great Northern Aster (*Canadanthus modestus*, S1 – Critically Imperiled): This species of the Aster family (*Asteraceae*) is fairly widespread in boreal and north temperate North America but rare over most of its range. Great Northern Aster reaches its southeastern distribution limit in New Brunswick, where populations are highly isolated from the species' main range, over 500 km disjunct from the nearest known occurrences near Chibougamau, Quebec. In New Brunswick, this calciphilic species was previously only known to occur along the Restigouche River, a small section of the Meduxnekeag River in Carleton County and the Right Hand Branch of the Green River in Madawaska County. We documented Great Northern Aster at a single location along the Northwest Upsalquitch River.

Intermediate Sedge (*Carex media*, S1 – Critically Imperiled; Figure 15E): This inconspicuous amphiatlantic sedge of peatlands, shores and open tundra occurs throughout North America's boreal zone and in the northern reaches of its temperate climate zone. In eastern North America, it ranges south to Michigan in the Great Lakes region and in Maine along the Atlantic Coast. Intermediate Sedge is extremely rare and geographically restricted in both New Brunswick and Maine and is not present in other Maritimes provinces. In New Brunswick, it is only known from a small number of locations on alkaline shores of the Green River and Restigouche watersheds in extreme northwestern Madawaska County and in Restigouche County. During this project, we found Intermediate Sedge at two locations on the Northwest Upsalquitch River, growing on moist calcareous shoreline ledges.

Rock Whitlow-grass (*Draba arabisans*, S1 – Critically Imperiled; Figure 23A): This small perennial mustard family (*Brassicaceae*) plant of northern affinity has a narrow global range limited to northeastern North America, where it typically occurs on high-pH bedrock cliffs and outcrops. The species is only known to occur from Ontario and the Great Lakes states east to northern New England and the Atlantic Region, and is considered to be of conservation concern over most of this range. In New Brunswick, Rock Whitlow-grass was previously known from only six sites, mainly concentrated along the Fundy Coast. During this project, we recorded the species at two locations on alkaline bedrock outcrops along the South Charlo River.

VASCULAR PLANT SPECIES DIVERSITY

Across all surveyed sites, we documented nearly 6,400 vascular plant location records for approximately 590 different taxa (Appendix 2), 85% of which are native to the province of New Brunswick, and 15% of which are introduced. Most notably, this data includes 1013 locations for 57 species of conservation concern (24 locations for Critically Imperiled species, 135 locations for Imperiled species and 854 locations for Vulnerable species; see *Species of Conservation Concern* and Table 1). Site-specific summaries of vascular plant diversity are provided in the *Site Summaries* section below.

Recorded native species richness varied considerably between survey sites from 183 species to 352 species, averaging 247. Total and native species richness were highest on the Northwest Upsalquitch River (352 spp. / 301 spp.), on the South Charlo River (302 spp. / 258 spp.) and in the vicinity of Lower Grindstone Brook (301 spp. / 252 spp.). The proportion of exotic species did not vary greatly across surveyed sites, ranging from 9% to 17% and averaging 13%, with highest values recorded at Grog Brook (17%), Jardine Brook (16%) and Lower Grindstone Brook (16%).

Although they provide general indications of habitat diversity and richness, native species counts are not a robust indicator of site condition or relative conservation value. Likewise, exotic species counts do not always provide an accurate inverse measure of a site's ecological integrity. Both metrics are greatly influenced by factors such as search effort, survey coverage, and the extent to which anthropogenic habitats were traversed.

A full list of all vascular plants documented through this project, with on-site abundance, is provided below in Appendix 2.

LICHEN DIVERSITY

Fieldwork documented over 600 location records for approximately 115 lichen species. Across all survey sites, we recorded 240 locations for 35 species of conservation concern in New Brunswick, including 26 locations for Critically Imperiled species, 20 locations for Imperiled species and 194 locations for Vulnerable species (see *Species of Conservation Concern* and Table 1). Most lichen occurrence data were collected by Alain Belliveau and Tom Neily, although all surveyors recorded at least some incidental observations. A full list of documented species is provided in Appendix 3.

BRYOPHYTE DIVERSITY

Bryologist / lichenologist Tom Neily documented over 400 location records for approximately 125 bryophyte species at seven of our survey sites (Whites Brook [upper section], Cheuters Brook, Northwest Upsalquitch River, Charlo River, South Charlo River, South Branch Benjamin River and Upper McNair Brook). These include 63 locations for 23 species of conservation concern, with seven locations for Critically Imperiled species, 26 locations for Imperiled species and 30 locations for Vulnerable species (see *Species of Conservation Concern* and Table 1). A full list of documented species is provided in Appendix 4.

INCIDENTAL ANIMAL OBSERVATIONS

Incidental observations made through this project documented occurrences of 88 animal species including 65 birds, 10 invertebrates, six mammals, six herptiles and one fish.

We documented 272 incidental observations of 57 different bird species during site surveys, with highest numbers of species recorded along the the Northwest Upsalquitch River (48 spp.), at Lower Grindstone Brook (41 spp.) and in the upper section of Whites Brook (35 spp.). Most observations were made during the first week of fieldwork, at sites surveyed in late July in the Restigouche River watershed. Less effort was made to document avifauna during late August fieldwork because it was outside of the typical breeding period for most bird species in the region, meaning that most observations would not provide reliable evidence of breeding.

Bird observations included 52 locations for 9 species of conservation concern (see *Species of Conservation Concern* and Table 1). Most notably, we recorded 37 locations for five bird Species at Risk listed Collected data include 13 locations for Canada Warbler (COSEWIC Threatened, SARA Threatened), 14 locations for Olive-sided Flycatcher (COSEWIC Special Concern, SARA Threatened), three locations for Common Nighthawk (COSEWIC Special Concern, SARA Threatened), one location for Harlequin Duck (COSEWIC Special Concern, SARA Special Concern) and six locations for Evening Grosbeak (COSEWIC Special Concern).

A full list of documented species is provided in Appendix 5.

TABLE 1. Species of conservation concern detected during surveys, with numbers of occurrence locations found at each survey site and provincial status ranks (S-rank, see Appendix 1 for definitions).

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE														
					Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.	
VASCULAR PLANT	<i>Arnica lonchophylla</i>	Northern Arnica	Asteraceae	S1							9	1							
	<i>Canadanthus modestus</i>	Great Northern Aster	Asteraceae	S1							1								
	<i>Carex media</i>	Intermediate Sedge	Cyperaceae	S1							2								
	<i>Draba arabisans</i>	Rock Whitlow-Grass	Brassicaceae	S1									2						
	<i>Gentiana rubricaulis</i>	Purple-stemmed Gentian	Gentianaceae	S1							1								
	<i>Moehringia macrophylla</i>	Large-Leaved Sandwort	Caryophyllaceae	S1		3									1	2			
	<i>Pinguicula vulgaris</i>	Common Butterwort	Lentibulariaceae	S1					1										
	<i>Poa interior</i>	Inland Bluegrass	Poaceae	S1?										1					
	<i>Polystichum lonchitis</i>	Northern Holly Fern	Dryopteridaceae	S1										1					
	<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2								5	15	7					8
	<i>Allium tricoccum</i>	Wild Leek	Liliaceae	S2														1	
	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Aspleniaceae	S2									3		1				2
	<i>Carex albicans var. emmonsii</i>	White-tinged Sedge	Cyperaceae	S2										1					
	<i>Carex concinna</i>	Beautiful Sedge	Cyperaceae	S2				1			23								
	<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's-Slipper	Orchidaceae	S2							1								
	<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	Orchidaceae	S2											1				
	<i>Poa glauca</i>	Glaucous Blue Grass	Poaceae	S2										1		1			
	<i>Viola novae-angliae</i>	New England Violet	Violaceae	S2										7					
<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2								1	1	3					3	

					SURVEY SITE															
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank																	
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.			
VASCULAR PLANT	<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3				1		1	2		1							
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3			4		1	7		4	41	90	6					
	<i>Galium boreale</i>	Northern Bedstraw	Rubiaceae	S3						3	1									
	<i>Gentianella amarella</i>	Northern Gentian	Gentianaceae	S3															1	
	<i>Hedysarum americanum</i>	Alpine Hedysarum	Fabaceae	S3			8													
	<i>Huperzia appressa</i>	Mountain Firmoss	Lycopodiaceae	S3										2	1					
	<i>Parnassia glauca</i>	Fen Grass-of-Parnassus	Saxifragaceae	S3			6													
	<i>Polypodium appalachianum</i>	Appalachian Polypody	Polypodiaceae	S3	1															
	<i>Primula mistassinica</i>	Mistassini Primrose	Primulaceae	S3					2		6									
	<i>Pyrola minor</i>	Lesser Pyrola	Pyrolaceae	S3							1									
	<i>Tanacetum bipinnatum ssp. huronense</i>	Lake Huron Tansy	Asteraceae	S3			2													
	<i>Triantha glutinosa</i>	Sticky False-Asphodel	Liliaceae	S3			6													
	<i>Trichophorum clintonii</i>	Clinton's Clubrush	Cyperaceae	S3						3				14						
	<i>Viola cf. adunca</i>	Hooked Violet	Violaceae	S3			3													
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3			4			1	30		5	7	4					
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	1						1	4	1	10	2	2	2	2	3	
	<i>Corallorhiza maculata</i>	Spotted Coralroot	Orchidaceae	S3S4			1													
	<i>Lobelia kalmii</i>	Brook Lobelia	Campanulaceae	S3S4			4				21									
	<i>Stachys pilosa</i>	Hairy Hedge-Nettle	Lamiaceae	S3S4				1		1										
	<i>Ephebe solida</i>	Thick-branched Rockshag Lichen	Lichinaceae	S1											1					
<i>Ephebe cf. perspinulosa</i>	Thread Lichen	Lichinaceae	S1											1						

					SURVEY SITE															
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank																	
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.			
LICHEN	<i>Collema tenax</i>	Soil Tarpaper Lichen	Collemaataceae	S1							1		1							
	<i>Leptogium intermedium</i>	Forty-five Jellyskin Lichen	Collemaataceae	S1									4							
	<i>Leptogium schraderi</i>	Schrader's Jellyskin Lichen	Collemaataceae	S1									1							
	<i>Phaeophyscia decolor</i>	Lesser Eye Shadow Lichen	Physciaceae	S1											2					
	<i>Euopsis granatina</i>	Lesser Rockbud Lichen	Lichinaceae	S1?		1														
	<i>Peltigera venosa</i>	Fan Pelt Lichen	Peltigeraceae	S1?	4								2			1				
	<i>Spilonema revertens</i>	Rock Hairball Lichen	Coccocarpiaceae	S1?		1														
	<i>Thermutis velutina</i>	Rockvelvet Lichen	Lichinaceae	S1?									1							
	<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen	Cystocoleaceae	S1S2		1							1							
	<i>Leptogium gelatinosum</i>	Rose-petalled Jellyskin Lichen	Collemaataceae	S1S2									2							1
	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	Pannariaceae	S2									1							
	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen	Nephromataceae	S2									1		1					
	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2							5		3	3						1
	<i>Nephroma arcticum</i>	Arctic Kidney Lichen	Nephromataceae	S2?									2		2	1				
	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen	Parmeliaceae	S3					1		1									
	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen	Cladoniaceae	S3																1
	<i>Cladonia strepsilis</i>	Olive Cladonia Lichen	Cladoniaceae	S3							1									
<i>Collema nigrescens</i>	Blistered Tarpaper Lichen	Collemaataceae	S3									1								

					SURVEY SITE														
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank																
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.		
LICHEN	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3				2			1		3	2	2				
	<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3		2	2		7									1	
	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1						1		1	1				1	
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	5	2		3			13	1	12	13			2	5	4
	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen	Collemataceae	S3?				1						1					
	<i>Cladina terrae-novae</i>	Newfoundland Reindeer Lichen	Cladoniaceae	S3S4												1			
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	1	5					5	4	4	15	6			1	
	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen	Collemataceae	S3S4				2											
	<i>Melanelia panniformis</i>	Shingled Camouflage Lichen	Parmeliaceae	S3S4															1
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	1	1	2				2		3	2					1
	<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen	Pannariaceae	S3S4							1		1						
	<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen	Pannariaceae	S3S4					1		1								
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1	1		1	1		3		5	1	1	1			1
	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	Lobariaceae	S3S4	1				2		1								
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4		3							2	8	3	1			2
	<i>Pseudoleskeella tectorum</i>	Rooftop Leskea Moss	Leskeaceae	S1									1						
	<i>Campylium radicale</i>	Long-stalked Fine Wet Moss	Amblystegiaceae	S1S2											1				
	<i>Hygrohypnum bestii</i>	Best's Brook Moss	Amblystegiaceae	S1S2											1				

					SURVEY SITE																
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank																		
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.				
BRYOPHYTE	<i>Seligeria brevifolia</i>	Shortleaf Bristle Moss	Seligeriaceae	S1S2				1						3							
	<i>Anomodon viticulosus</i>	Shortleaf Bristle Moss	Anomodontaceae	S2							3										
	<i>Didymodon ferrugineus</i>	Shortleaf Bristle Moss	Pottiaceae	S2									1								
	<i>Ditrichum flexicaule</i>	Flexible Cow-hair Moss	Ditrichaceae	S2		1															
	<i>Dicranum spurium</i>	Spurred Broom Moss	Dicranaceae	S2?		1															
	<i>Seligeria campylopoda</i>	Small Limestone Moss	Seligeriaceae	S2?		1															
	<i>Bryum uliginosum</i>	Ceruous Thread-moss	Bryaceae	S2S3									1		1						
	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss	Mniaceae	S2S3										2							
	<i>Hypnum cupressiforme var. filiforme</i>	Cypress-leaved Plaitmoss	Hypnaceae	S2S3									1		1						
	<i>Orthotrichum speciosum</i>	Showy Bristle Moss	Orthotrichaceae	S2S3				1		1		1									1
	<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3						1		2	3	1							2
	<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss	Pottiaceae	S3				1		2		1	2								
	<i>Tortella fragilis</i>	Fragile Twisted Moss	Pottiaceae	S3				1		1											
	<i>Abietinella abietina</i>	Wiry Fern Moss	Thuidiaceae	S3S4		1								1							1
	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss	Pottiaceae	S3S4									1								
	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4				2				2		1							1
	<i>Fissidens bryoides</i>	Lesser Pocket Moss	Fissidentaceae	S3S4						1			2								
<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss	Pterigynandraceae	S3S4								1										

					SURVEY SITE														
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank																
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.		
	<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4				1			2		2	1					1
	<i>Trichostomum tenuirostre</i>	Acid-Soil Moss	Pottiaceae	S3S4									1						
BIRD	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Anatidae	S1B, S1S2N, S2M										1					
	<i>Spinus pinus</i>	Pine Siskin	Fringillidae	S3		1	2				1								
	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	1	3	1			1	8								
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	1	1	1	1			10								
	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM			1		1		3					1			
	<i>Chordeiles minor</i>	Common Nighthawk	Caprimulgidae	S3B, S4M			1		1		1								
	<i>Setophaga tigrine</i>	Cape May Warbler	Parulidae	S3B, S4S5M			1												
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M		2	1			1	3				1			1	
	<i>Gallinago delicata</i>	Wilson's Snipe	Scolopacidae	S3S4B, S5M						1									

CONTRIBUTIONS OF THE PROJECT

This project was highly successful in documenting a very large number of rare species locations and in documenting the diversity of vascular plants, lichens, bryophytes and birds in 13 of northern New Brunswick's calcareous ravines and river valleys. Our fieldwork resulted in the discovery of 1,369 locations for 124 different taxa of conservation concern in New Brunswick (57 vascular plants, 35 macrolichens, 23 bryophytes and nine birds), including 58 location records for 26 Critically Imperiled species, 181 location records for 31 Imperiled species, and 1,130 location records for 68 Vulnerable species.

The project documented several very significant finds for New Brunswick, including the discovery of one vascular plant and eight lichens which were not previously known to occur in the province: Inland Bluegrass [*Poa interior*], Thick-branched Rockshag Lichen [*Ephebe solida*], Lesser Eye Shadow Lichen [*Phaeophyscia decolor*], Schrader's Jellyskin Lichen [*Leptogium schraderi*], Lesser Rockbud Lichen [*Euopsis granatina*], Rock Hairball Lichen [*Spilonema revertens*], Rockvelvet Lichen [*Thermutis velutina*], Rimmed Cobblestone Lichen [*Acarospora glaucocarpa*] and a jellyskin lichen with no recognized common name [*Leptogium massiliense*]. We also found additional occurrences of several plant and lichen species first discovered in New Brunswick through AC CDC fieldwork in 2017 (Northern Holly Fern [*Polystichum lonchitis*], Large-leaved Sandwort [*Moehringia macrophylla*], Thread Lichen [*Ephebe perspinulosa*], Soil Tarpaper Lichen [*Collema tenax*], Forty-five Jellyskin Lichen [*Leptogium intermedium*]).

Through precise documentation of rare species and communities, the project has allowed for the fine-scale identification of several areas of conservation significance which represent potential future targets for protected area designation. Our results show the Upsalquitch River and Charlo River watersheds to be especially rich in provincially rare species, particularly the South Charlo River gorge where 2017 and 2018 surveys revealed that this site holds one of the most significant rare species concentrations in New Brunswick and supports the only known provincial occurrences of two vascular plants (Inland Bluegrass and Northern Holly Fern) and one lichen (Forty-five Jellyskin Lichen).

The extensive occurrence data collected through this project has improved our understanding of the status of many rare species and communities in the province and has greatly informed ongoing species rank reassessments. This will in turn make a significant contribution in focusing conservation action on species and areas most in need of protection.

All species occurrence information collected will be permanently documented via incorporation into the AC CDC's GIS-linked database, where it will be made available for provincial agencies and land conservation organizations, and will be provided in response to any area- or species-specific data request.

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SITE SUMMARIES

WHITES BROOK (LOWER)

Survey date: July 25th 2018

Observer(s): A.G. Belliveau

Survey track length: 12.1 km

Total number of rare species documented: 14

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
198	181	17	91	9	5

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	1
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	3
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	2
	<i>Polypodium appalachianum</i>	Appalachian Polypody	Polypodiaceae	S3	1
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	1
LICHEN	<i>Peltigera venosa</i>	Fan Pelt Lichen	Peltigeraceae	S1?	4
	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	5
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	1
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	Lobariaceae	S3S4	1
BIRD	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	1
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	1

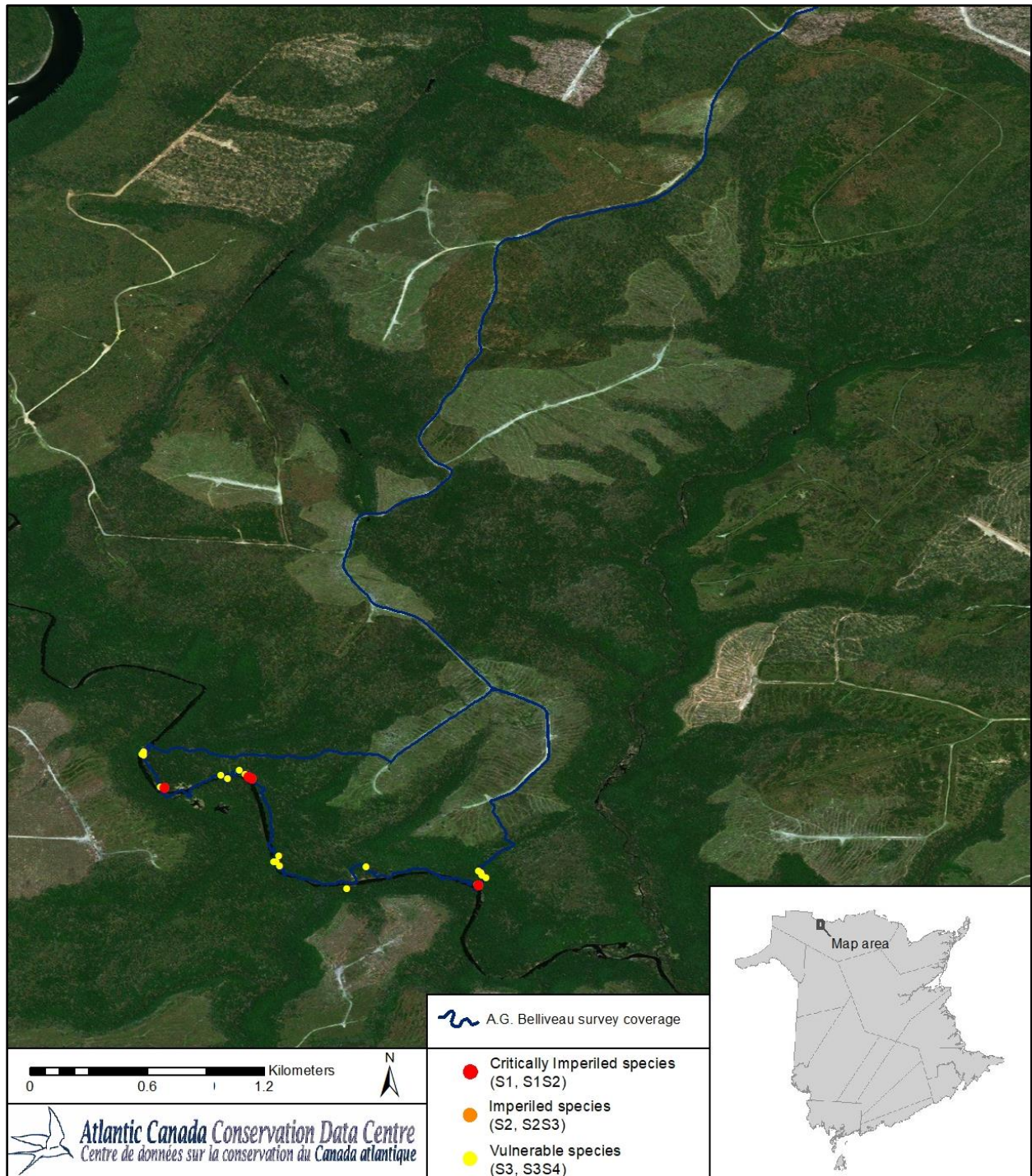


Figure 2. Survey coverage and rare species locations documented along the lower section of Whites Brook, Restigouche County, NB, on July 25th 2018. Aerial imagery from ESRI, 2019.



Figure 3. Whites Brook (lower section). **A)** Narrow cobble shores, shrubby shoreline thickets and mature White Spruce (*Picea glauca*)-dominated forest on valley slopes. **B)** Mature Eastern White Cedar (*Thuja occidentalis*)-dominated forest on steep valley slope. **C)** Extensive calcareous shoreline outcrops. **D)** Steller's Rockbrake (*Cryptogramma stelleri*, S3 – Vulnerable) on mossy calcareous bedrock outcrop.

WHITES BROOK (UPPER)

Survey date: July 25th 2018

Observer(s): C.S. Blaney; T.H. Neily

Survey track length: 19.8 km

Total number of rare species documented: 22

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
240	215	25	90	10	5

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Moehringia macrophylla</i>	Large-Leaved Sandwort	Caryophyllaceae	S1	3
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	7
	<i>Carex haydenii</i>	Hayden's Sedge	Cyperaceae	S3	1
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	5
LICHEN	<i>Euopsis granatina</i>	Lesser Rockbud Lichen	Lichinaceae	S1?	1
	<i>Spilonema revertens</i>	Rock Hairball Lichen	Coccocarpiaceae	S1?	1
	<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen	Cystocoleaceae	S1S2	1
	<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3	2
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	2
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	5
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	3
BRYOPHYTE	<i>Ditrichum flexicaule</i>	Flexible Cow-hair Moss	Ditrichaceae	S2	1
	<i>Dicranum spurium</i>	Spurred Broom Moss	Dicranaceae	S2?	1
	<i>Seligeria campylopoda</i>	Small Limestone Moss	Seligeriaceae	S2?	1
	<i>Abietinella abietina</i>	Wiry Fern Moss	Thuidiaceae	S3S4	1
BIRD	<i>Spinus pinus</i>	Pine Siskin	Fringillidae	S3	1
	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	3
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	1
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	2

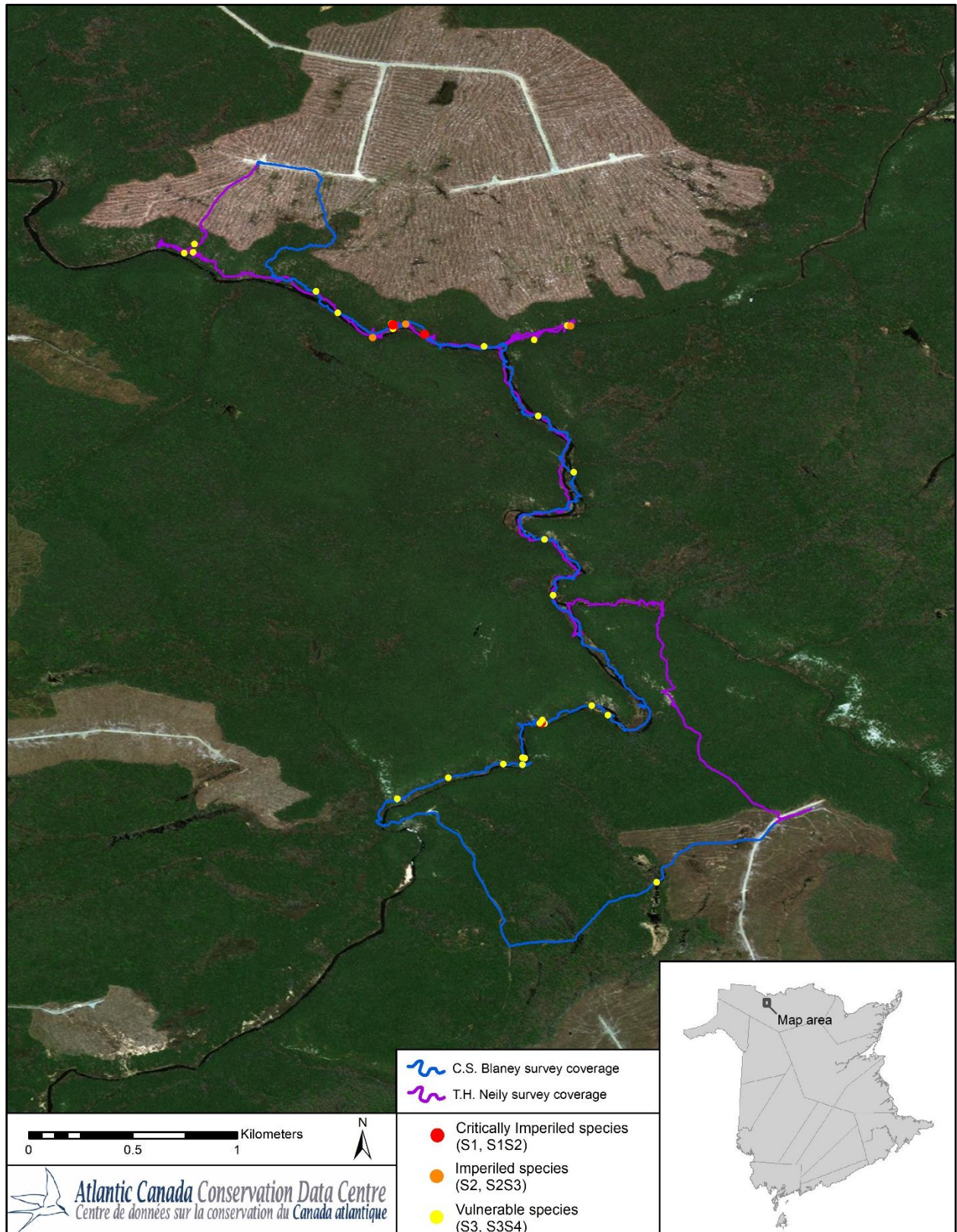


Figure 4. Survey coverage rare species locations documented along the upper section of Whites Brook, Restigouche County, NB, on July 25th 2018. Aerial imagery from ESRI, 2019.

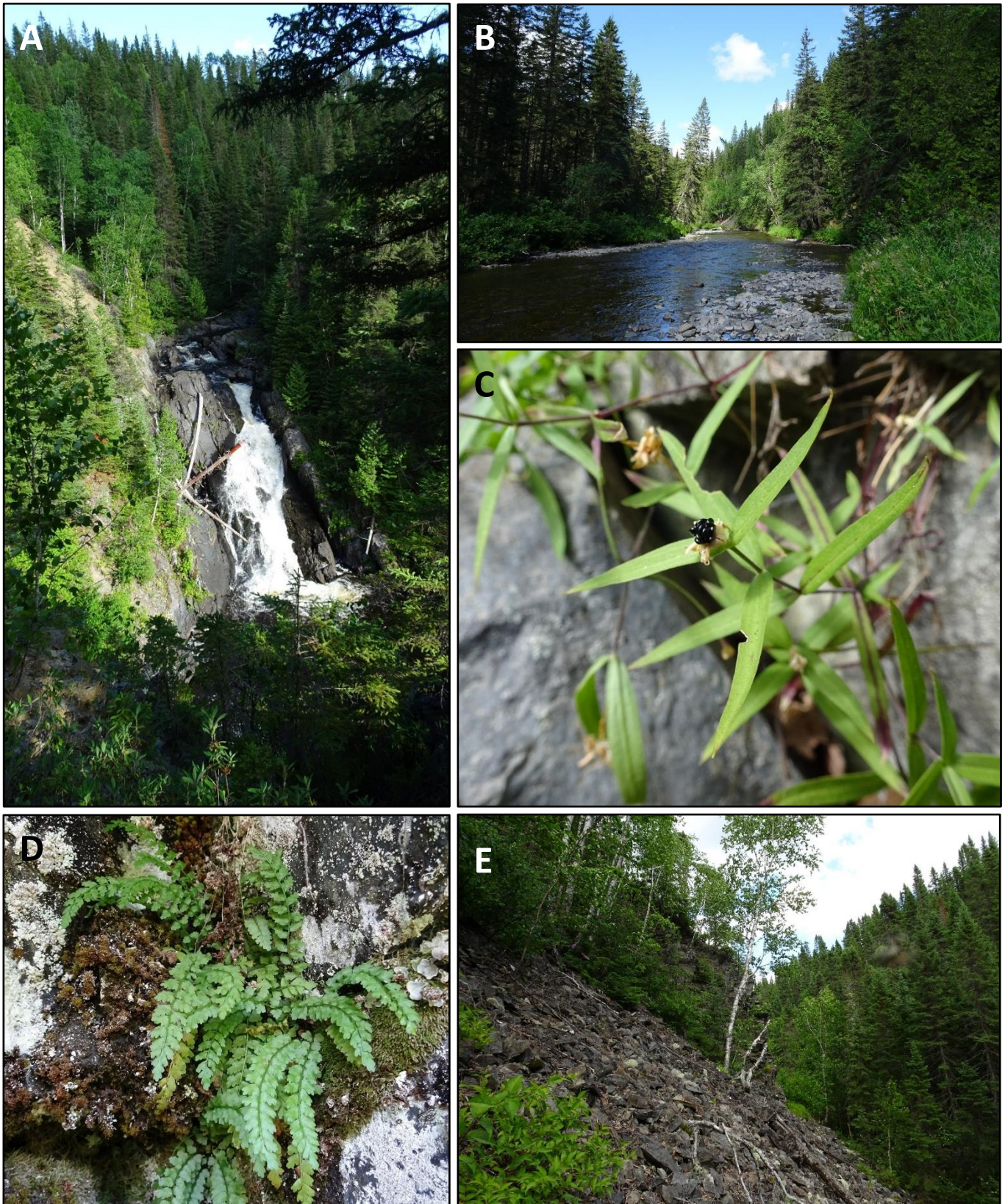


Figure 5. Whites Brook (upper section). **A)** Waterfall over bedrock cliff in brook ravine, with mature forest dominated by White Spruce (*Picea glauca*). **B)** Cobble shore and mature White Spruce forest along brook. **C)** Large-leaved Sandwort (*Moehringia macrophylla*, S1 – Critically Imperiled) on alkaline bedrock outcrop. **D)** Green Spleenwort (*Asplenium viride*, S3 – Vulnerable) on alkaline bedrock outcrop. **E)** Scree slope, bedrock outcrop and mature White Spruce forest in abrupt brook ravine.

LOWER GRINDSTONE BROOK (including section of Cheuters Brook and Restigouche River shore)

Survey date: July 24th 2018

Observer(s): C.S. Blaney

Survey track length: 17.6 km

Total number of rare species documented: 22

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
301	252	49	84	16	13

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Solidago altissima</i>	Tall Goldenrod	Asteraceae	S2S3	5
	<i>Symphotrichum anticostense</i>	Anticosti Aster	Asteraceae	S2S3	5
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	1
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	2
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	4
	<i>Hedysarum americanum</i>	Alpine Hedysarum	Fabaceae	S3	8
	<i>Parnassia glauca</i>	Fen Grass-of-Parnassus	Saxifragaceae	S3	6
	<i>Tanacetum bipinnatum</i> ssp. <i>Huronense</i>	Lake Huron Tansy	Asteraceae	S3	2
	<i>Triantha glutinosa</i>	Sticky False-Asphodel	Liliaceae	S3	6
	<i>Viola cf. adunca</i>	Hooked Violet	Violaceae	S3	3
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	4
	<i>Corallorhiza maculata</i>	Spotted Coralroot	Orchidaceae	S3S4	1
	<i>Lobelia kalmii</i>	Brook Lobelia	Campanulaceae	S3S4	4
LICHEN	<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3	2
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	2
BIRD	<i>Spinus pinus</i>	Pine Siskin	Fringillidae	S3	2
	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	1
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	1
	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM	1
	<i>Chordeiles minor</i>	Common Nighthawk	Caprimulgidae	S3B, S4M	1
	<i>Setophaga tigrina</i>	Cape May Warbler	Parulidae	S3B, S4S5M	1
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	1

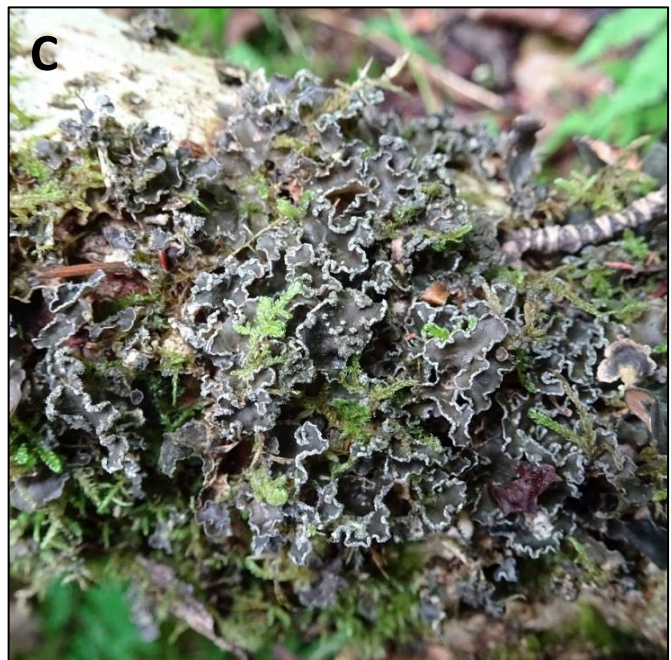


Figure 6. Lower Grindstone Brook. A) Hooked Violet (*Viola cf. adunca*, S3 – Vulnerable) growing on mossy ledge with loose material from alkaline bedrock outcrop. **B)** Pimpled Kidney Lichen (*Nephroma resupinatum*, S3 – Vulnerable) on mossy tree trunk in mature forest on brook valley slope. **C)** Powdery Kidney Lichen (*Nephroma parile*, S3S4 – Vulnerable) on mossy tree trunk in mature forest on brook valley slope.

CHEUTERS BROOK (including section of Restigouche River shore)

Survey date: July 24th 2018

Observer(s): D.M. Mazerolle; T.H. Neily

Survey track length: 27.3 km

Total number of rare species documented: 20

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
247	210	37	85	15	8

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Carex concinna</i>	Beautiful Sedge	Cyperaceae	S2	1
	<i>Corallorhiza maculata</i> var. <i>maculata</i>	Spotted Coralroot	Orchidaceae	S2S3	2
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	1
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	3
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	7
	<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3	1
	<i>Stachys pilosa</i>	Hairy Hedge-Nettle	Lamiaceae	S3S4	1
LICHEN	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemaaceae	S3	2
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	3
	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen	Collemaaceae	S3?	1
	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen	Collemaaceae	S3S4	2
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
BRYOPHYTE	<i>Seligeria brevifolia</i>	Shortleaf Bristle Moss	Seligeriaceae	S1S2	1
	<i>Orthotrichum speciosum</i>	Showy Bristle Moss	Orthotrichaceae	S2S3	1
	<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss	Pottiaceae	S3	1
	<i>Tortella fragilis</i>	Fragile Twisted Moss	Pottiaceae	S3	1
	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4	2
	<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4	1
BRID	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	1

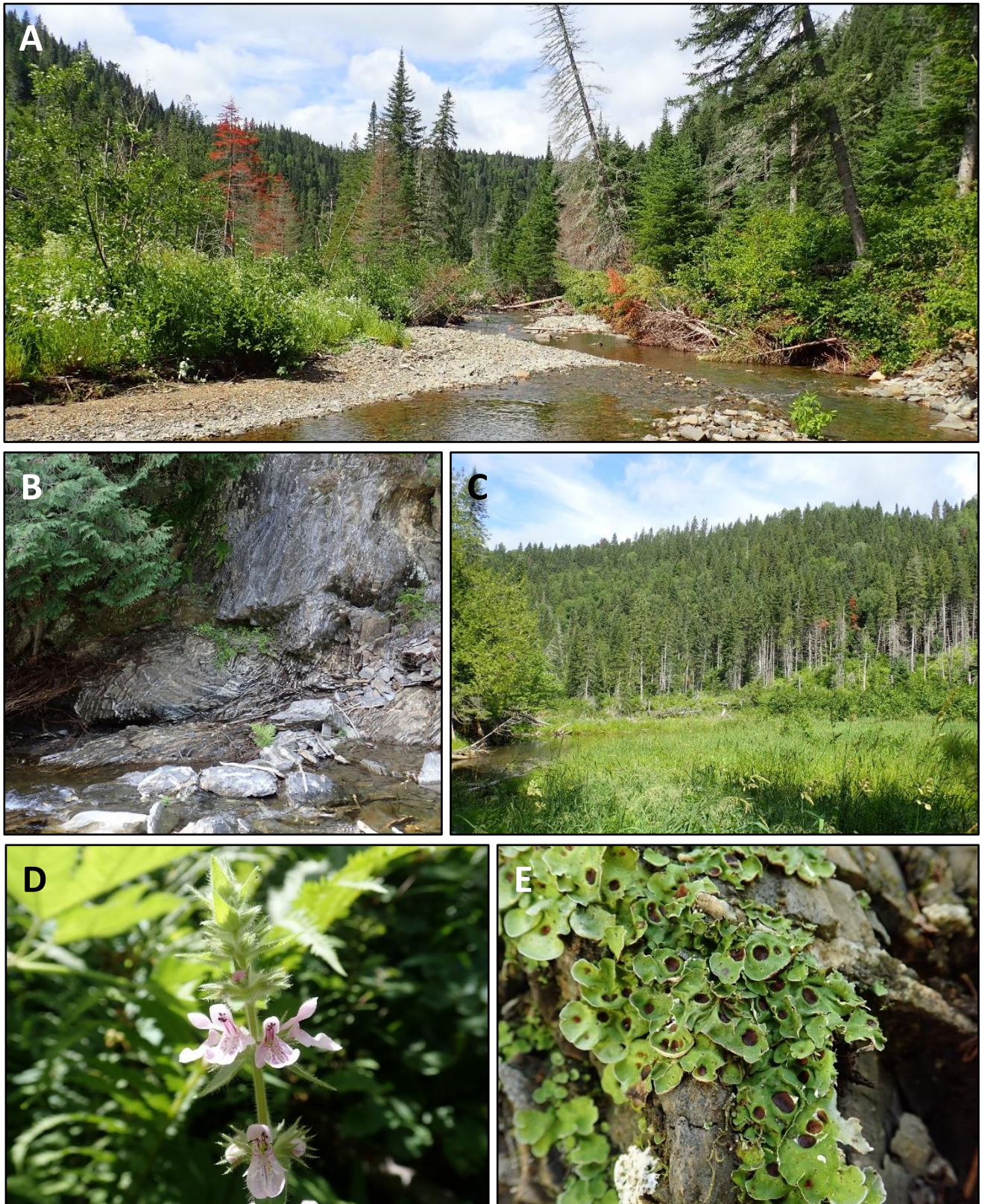


Figure 7. Cheuters Brook. **A)** Wide cobble shores, shrubby shoreline thickets and mature White Spruce (*Picea glauca*)-dominated forest on valley slopes. **B)** Calcareous shoreline bedrock outcrop. **C)** Wide marshy meadow along slow-flowing brook section, with adjacent band of Eastern White Cedar (*Thuja occidentalis*) riparian swamp and mature White Spruce forest on slope. **D)** Hairy Hedge-nettle (*Stachys pilosa*, S3S4 – Vulnerable) on calcareous shore. **E)** Woodland Owl Lichen (*Solorina saccata*, S3 – Vulnerable) on calcareous bedrock outcrop.

JARDINE BROOK (including a section of Restigouche River shore)

Survey date: July 24th 2018

Observer(s): A.G. Belliveau

Survey track length: 8.8 km

Total number of rare species documented: 11

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
183	154	29	84	16	4

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Pinguicula vulgaris</i>	Common Butterwort	Lentibulariaceae	S1	1
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	1
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	1
	<i>Primula mistassinica</i>	Mistassini Primrose	Primulaceae	S3	2
LICHEN	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen	Parmeliaceae	S3	1
	<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3	7
	<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen	Pannariaceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	Lobariaceae	S3S4	2
BIRD	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM	1
	<i>Chordeiles minor</i>	Common Nighthawk	Caprimulgidae	S3B, S4M	1



Figure 8. Jardine Brook. **A)** Widening of brook at valley bottom with evidence of past Beaver-caused flooding, including abundant standing and fallen coarse woody debris. **B)** Narrow calcareous swamp community of Eastern White Cedar (*Thuja occidentalis*), Black Ash (*Fraxinus nigra*) and Balsam Fir (*Abies balsamea*) along brook. **C)** Calcareous outcrop along brook. **D)** Healthy thallus of Pimpled Kidney Lichen (*Nephroma resupinatum*, S3 – Vulnerable) on Red Maple (*Acer rubrum*) in mature forest on brook valley slope. **E)** Common Butterwort (*Pinguicula vulgaris*, S1 – Critically Imperiled) on moist calcareous slope above shore along the Restigouche River.

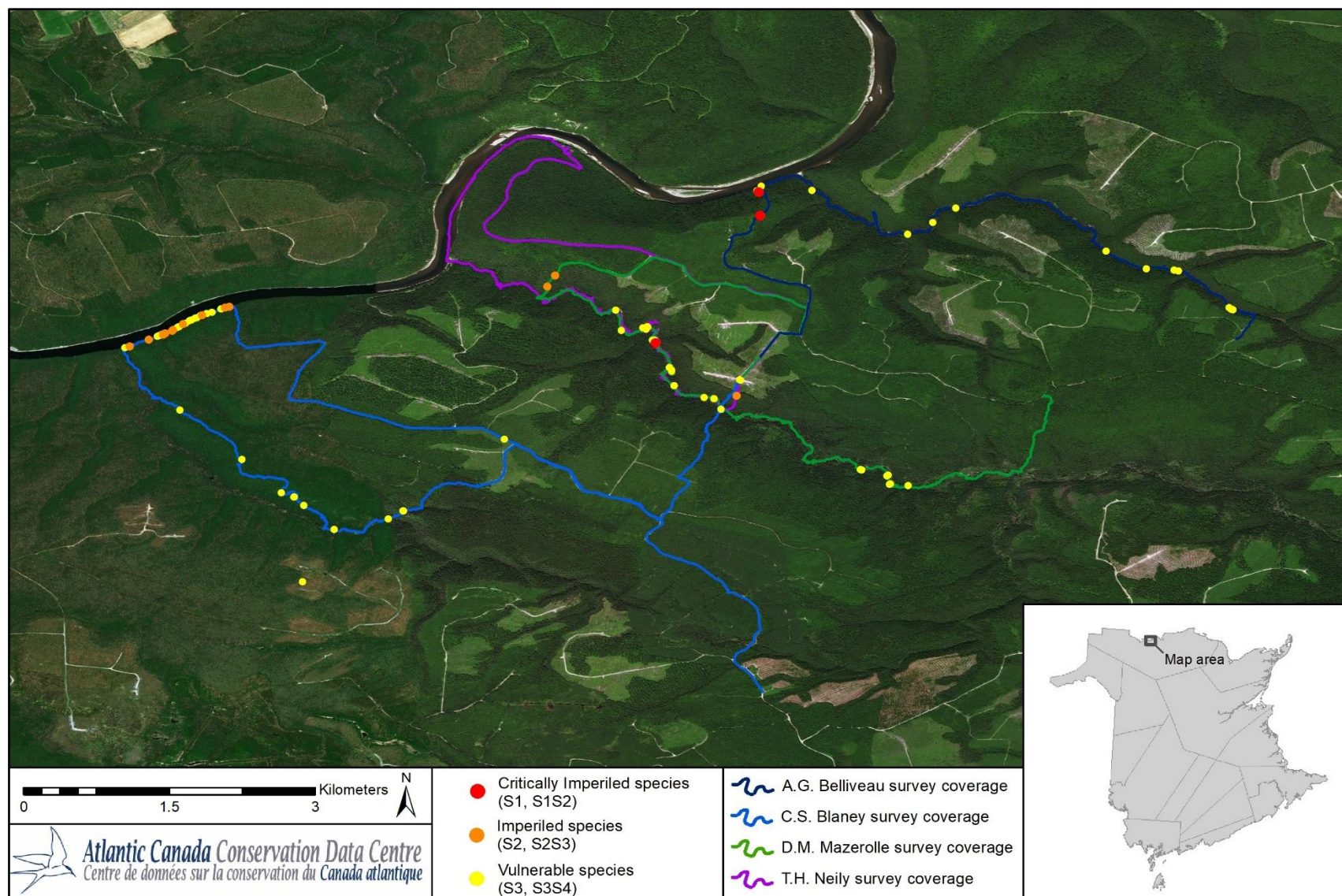


Figure 9. Survey coverage and rare species locations documented along Lower Grindstone Brook (surveyed by C.S. Blaney), Cheuters Brook (surveyed by D.M. Mazerolle and T.H. Neily) and Jardine Brook (surveyed by A.G. Belliveau), Restigouche County, NB, on July 24th 2018. Aerial imagery from ESRI, 2019.

GROG BROOK

Survey date: July 25th 2018

Observer(s): D.M. Mazerolle

Survey track length: 13.7 km

Total number of rare species documented: 15

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
247	204	43	83	17	12

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Corallorhiza maculata</i> var. <i>maculata</i>	Spotted Coralroot	Orchidaceae	S2S3	1
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	1
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	3
	<i>Carex garberi</i>	Garber's Sedge	Cyperaceae	S3	1
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	2
	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	1
	<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3	1
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	7
	<i>Galium boreale</i>	Northern Bedstraw	Rubiaceae	S3	3
	<i>Trichophorum clintonii</i>	Clinton's Clubrush	Cyperaceae	S3	3
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	1
	<i>Stachys pilosa</i>	Hairy Hedge-Nettle	Lamiaceae	S3S4	1
BIRD	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	1
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	1
	<i>Gallinago delicata</i>	Wilson's Snipe	Scolopacidae	S3S4B, S5M	1

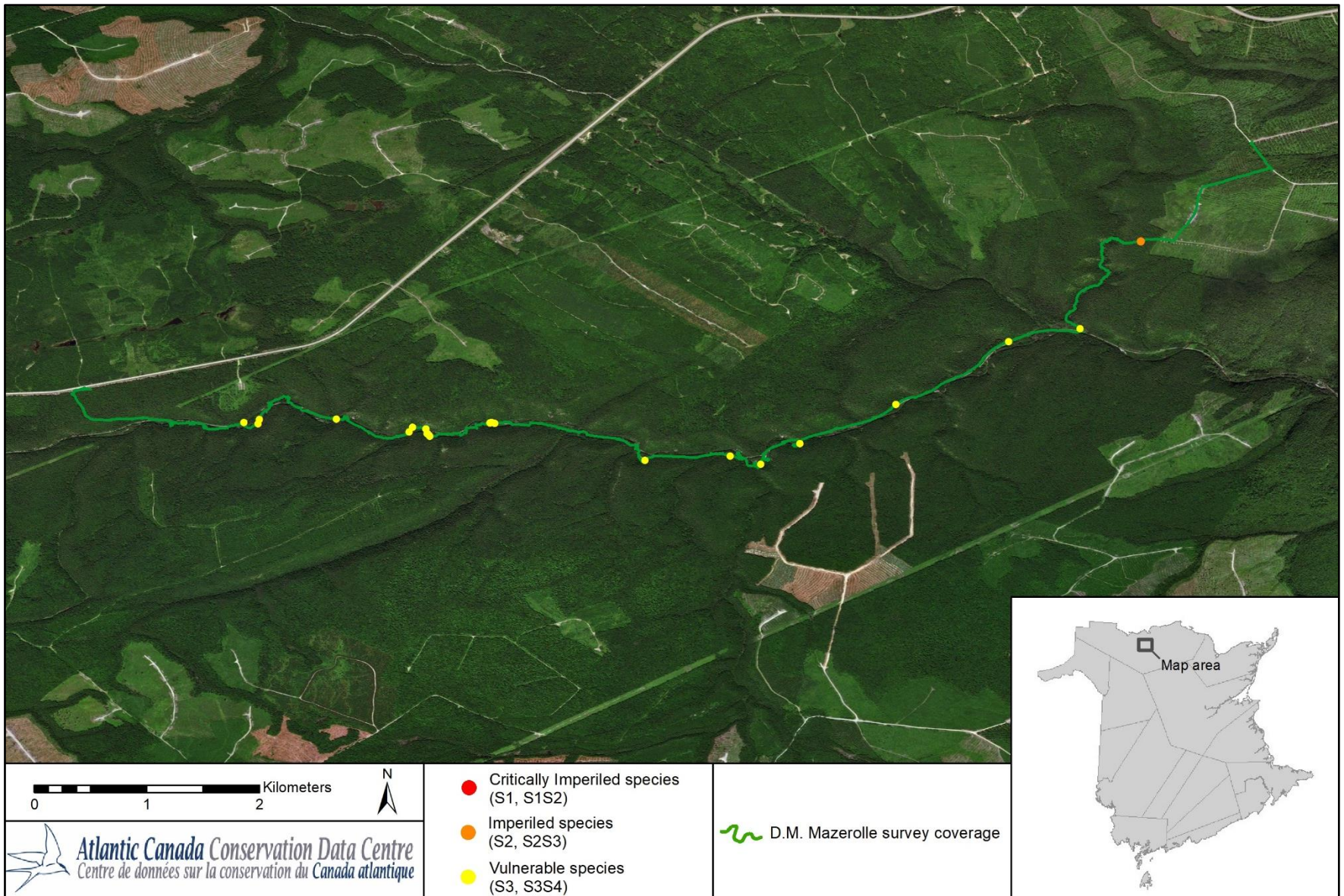


Figure 10. Survey coverage and rare species locations documented along Grog Brook, Restigouche County, NB, on July 25th 2018. Aerial imagery from ESRI, 2019.

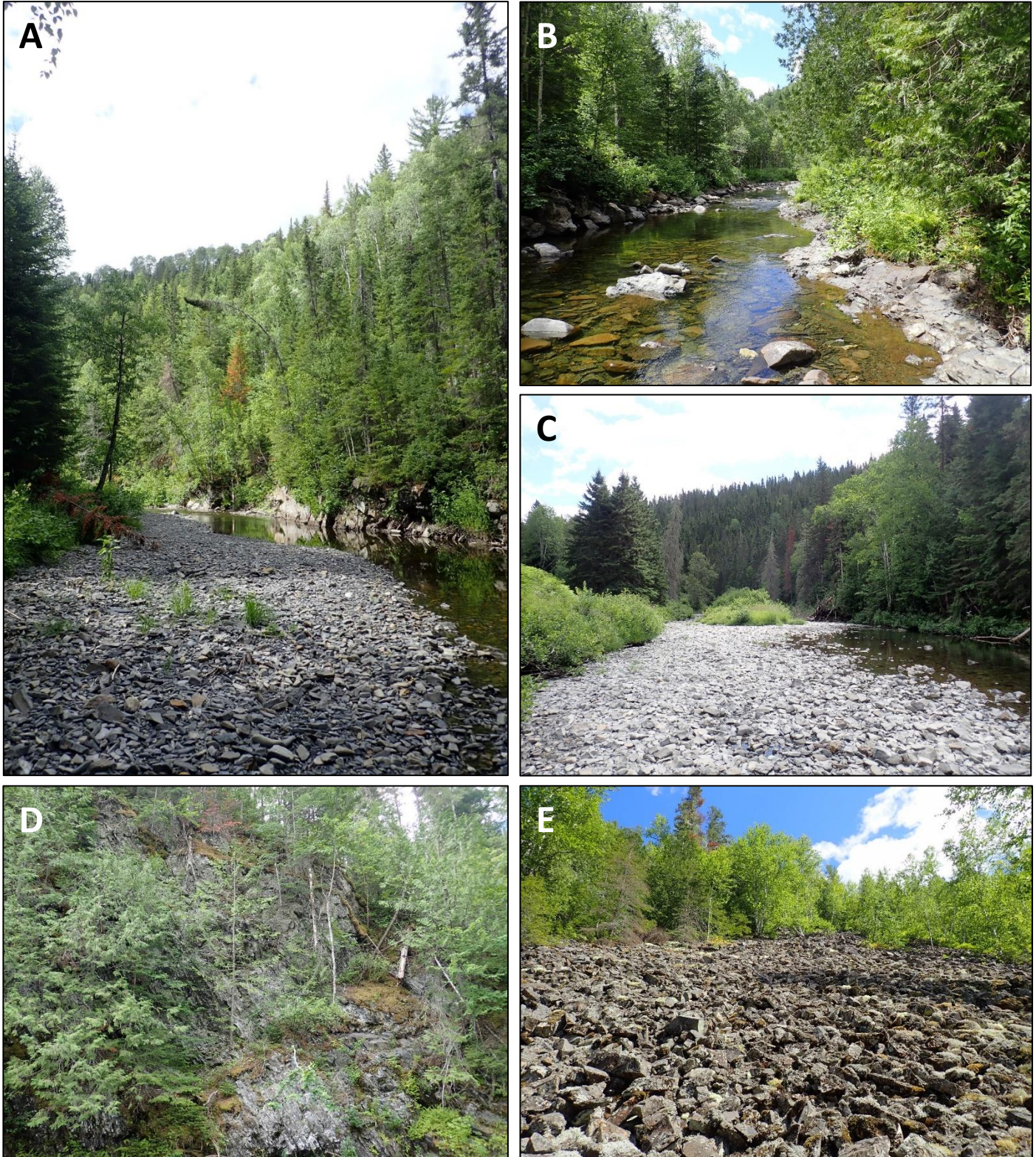


Figure 11. Grog Brook. **A)** Wide cobble shore, calcareous bedrock outcrops and mature mixed forest on steep valley slope. **B)** Boulder and outcrop shore and dense shrubby riparian forest. **C)** Wide cobble shore, shrubby riparian meadows and mature White Spruce (*Picea glauca*) forest on valley slope. **D)** Slightly seepy semi-forested calcareous bedrock outcrop cliff. **E)** Extensive dry scree slope supporting a lichen community mainly composed of reindeer lichens (*Cladina* spp., *Cladonia* spp.).

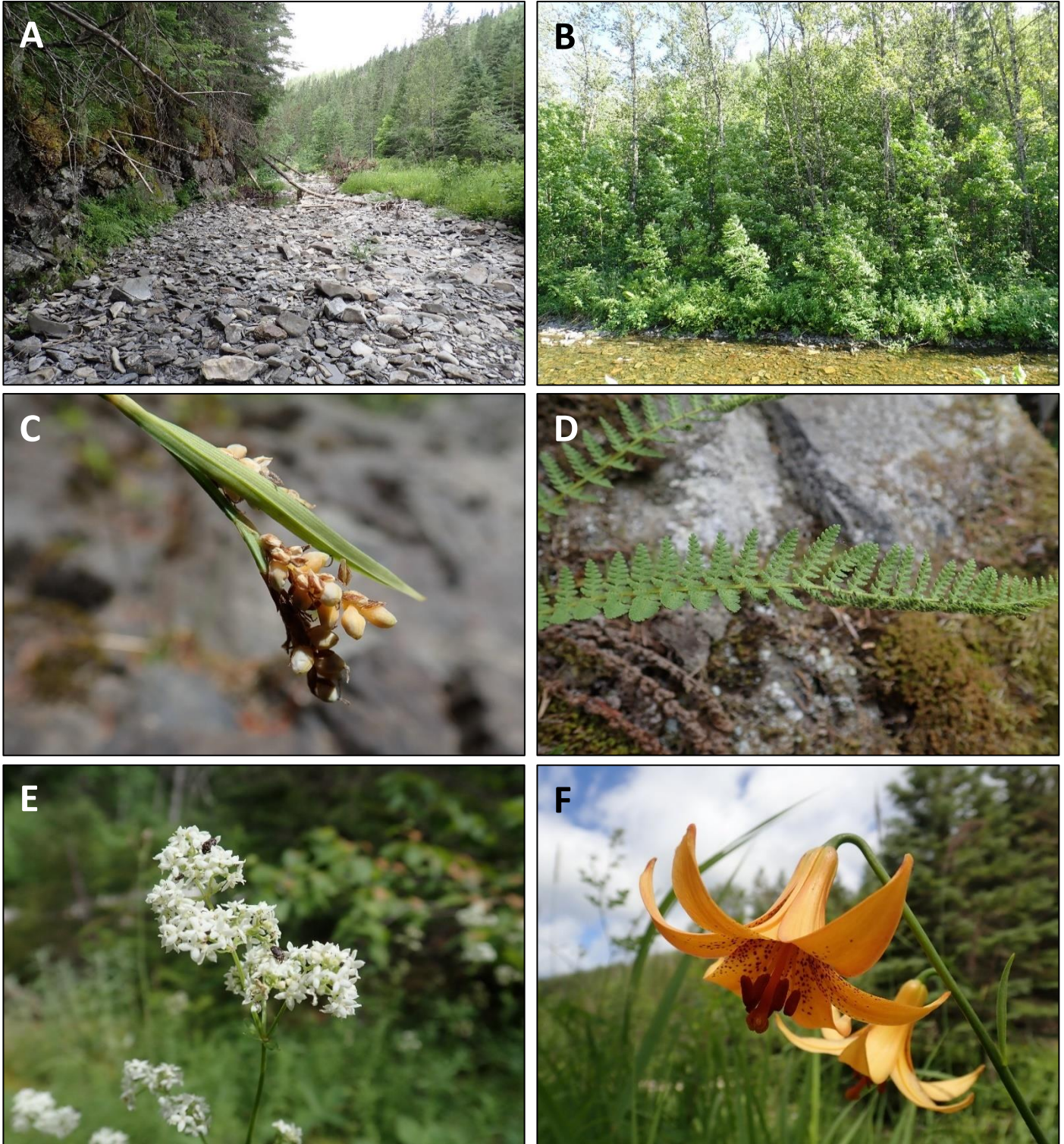


Figure 12. Grog Brook. **A)** Wide cobble and boulder shore and calcareous bedrock outcrop at base of steep valley slope. **B)** Mature floodplain forest of Balsam Poplar (*Populus balsamifera*) and Black Ash (*Fraxinus nigra*) with understory of Ostrich Fern (*Matteuccia struthiopteris*) and Green False Hellebore (*Veratrum viride*). This community type is considered S3 – Vulnerable. **C)** Garber’s Sedge (*Carex garberi*, S3 – Vulnerable) on alkaline outcrop. **D)** Fragrant Wood Fern (*Dryopteris fragrans* var. *remotiuscula*, S3 – Vulnerable) on slightly alkaline outcrop. **E)** Northern Bedstraw (*Galium boreale*, S3 – Vulnerable) in forest opening above calcareous shoreline outcrop. **F)** Canada Lily (*Lilium canadense*) in graminoid-dominated floodplain meadow.

NORTHWEST UPSALQUITCH RIVER

Survey date: July 26th and 27th 2018

Observer(s): A.G. Belliveau; C.S. Blaney; D.M. Mazerolle; T.H. Neily

Survey track length: 47.9 km

Total number of rare species documented: 50

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
352	301	51	86	14	24

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Arnica lonchophylla</i>	Northern Arnica	Asteraceae	S1	9
	<i>Canadanthus modestus</i>	Great Northern Aster	Asteraceae	S1	1
	<i>Carex media</i>	Intermediate Sedge	Cyperaceae	S1	1
	<i>Gentiana rubricaulis</i>	Purple-stemmed Gentian	Gentianaceae	S1	1
	<i>Carex concinna</i>	Beautiful Sedge	Cyperaceae	S2	23
	<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's-Slipper	Orchidaceae	S2	1
	<i>Woodsia alpina / glabella</i>	a cliff fern	Dryopteridaceae	S2/S3	9
	<i>Juncus brachycephalus</i>	Small-Head Rush	Juncaceae	S2S3	3
	<i>Neottia auriculata</i>	Auricled Twayblade	Orchidaceae	S2S3	3
	<i>Rumex occidentalis</i>	Western Dock	Polygonaceae	S2S3	19
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	60
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	92
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	6
	<i>Carex garberi</i>	Garber's Sedge	Cyperaceae	S3	3
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	1
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	1
	<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3	2
	<i>Galium boreale</i>	Northern Bedstraw	Rubiaceae	S3	1
	<i>Primula mistassinica</i>	Mistassini Primrose	Primulaceae	S3	6
	<i>Pyrola minor</i>	Lesser Pyrola	Pyrolaceae	S3	1
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	30
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	1
	<i>Lobelia kalmii</i>	Brook Lobelia	Campanulaceae	S3S4	21

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
LICHEN	<i>Collema tenax</i>	Soil Tarpaper Lichen	Collemataceae	S1	1
	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2	5
	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen	Parmeliaceae	S3	1
	<i>Cladonia strepsilis</i>	Olive Cladonia Lichen	Cladoniaceae	S3	1
	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3	1
	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	13
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	5
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	2
	<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen	Pannariaceae	S3S4	1
	<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen	Pannariaceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	3
	<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	Lobariaceae	S3S4	1
	BRYOPHYTE	<i>Anomodon viticulosus</i>	Shortleaf Bristle Moss	Anomodontaceae	S2
<i>Orthotrichum speciosum</i>		Showy Bristle Moss	Orthotrichaceae	S2S3	1
<i>Saelania glaucescens</i>		Blue Dew Moss	Ditrichaceae	S2S3	1
<i>Hymenostylium recurvirostre</i>		Hymenostylium Moss	Pottiaceae	S3	2
<i>Tortella fragilis</i>		Fragile Twisted Moss	Pottiaceae	S3	1
<i>Fissidens bryoides</i>		Lesser Pocket Moss	Fissidentaceae	S3S4	1
<i>Myurella julacea</i>		Small Mouse-tail Moss	Pterigynandraceae	S3S4	2
BIRD	<i>Spinus pinus</i>	Pine Siskin	Fringillidae	S3	1
	<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	8
	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	10
	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM	3
	<i>Chordeiles minor</i>	Common Nighthawk	Caprimulgidae	S3B, S4M	1
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	3

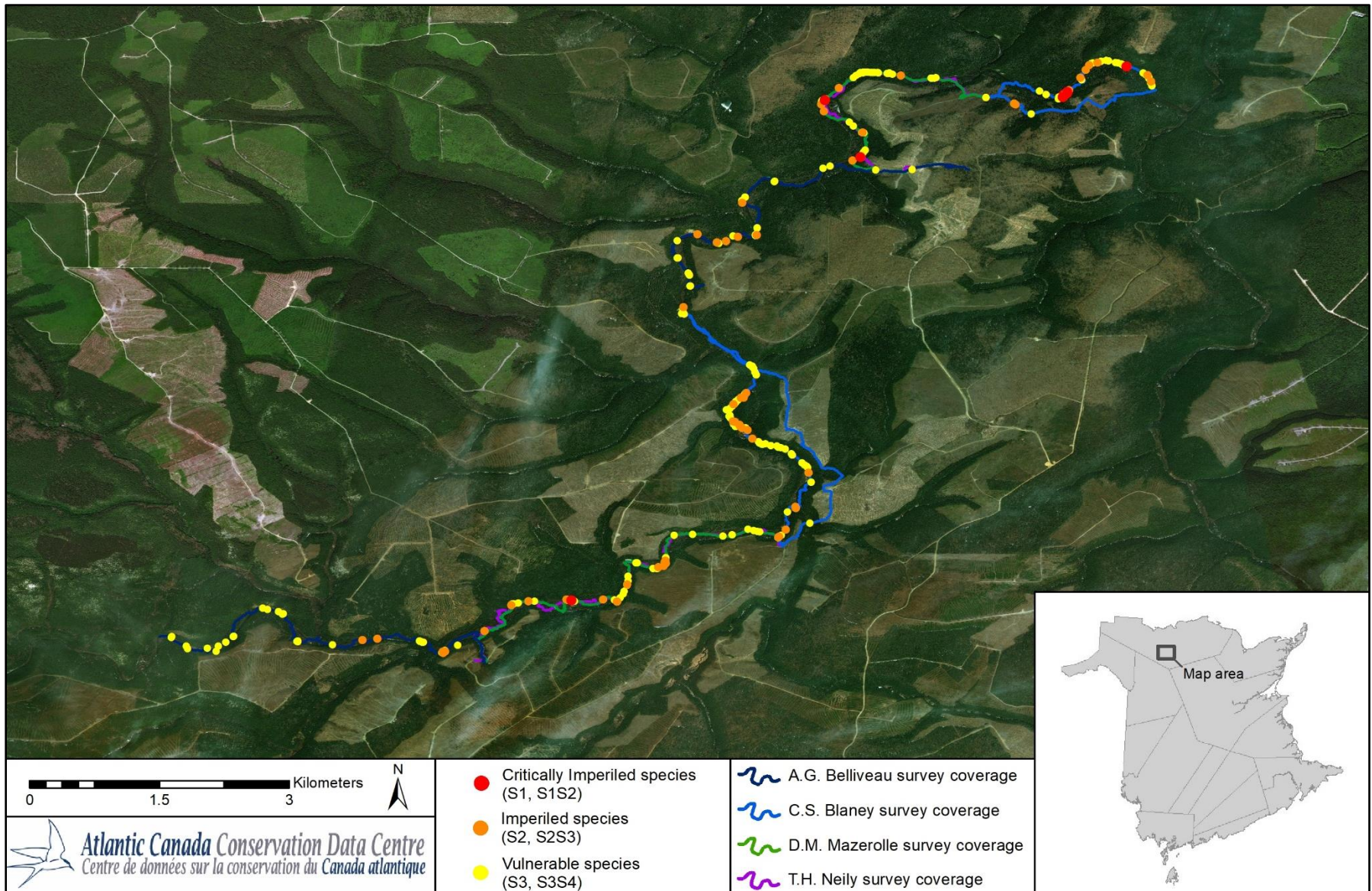


Figure 13. Survey coverage and rare species locations documented along Northwest Upsalquitch River, Restigouche County, NB, on July 26th and 27th 2018. Aerial imagery from ESRI, 2019.

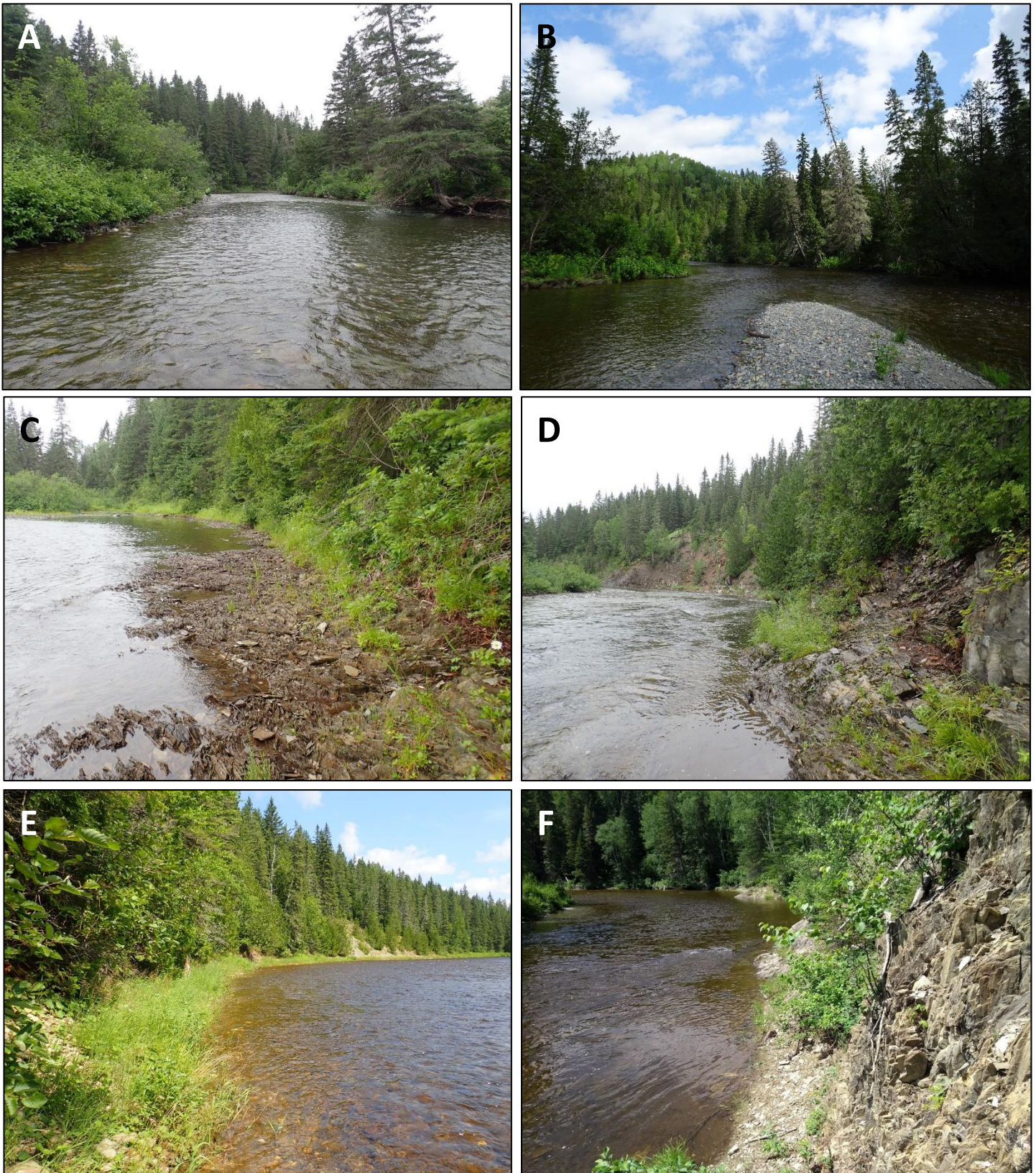


Figure 14. Northwest Upsalquitch River. **A)** Speckled Alder (*Alnus rugosa* ssp. *rugosa*) riparian swamp and mature White Spruce (*Picea glauca*) forest on gentle valley slopes. **B)** Wide gravel bar, White Spruce floodplain forest and mature mixed forest on valley slope. **C)** Low alkaline shoreline outcrops. **D)** Seepy alkaline shoreline outcrops and steep valley slope. **E)** Mature White Spruce and Eastern White Cedar (*Thuja occidentalis*) forest on steep slope and narrow meadow on seepy calcareous cobble shore. **F)** Dry calcareous shoreline bedrock outcrop.

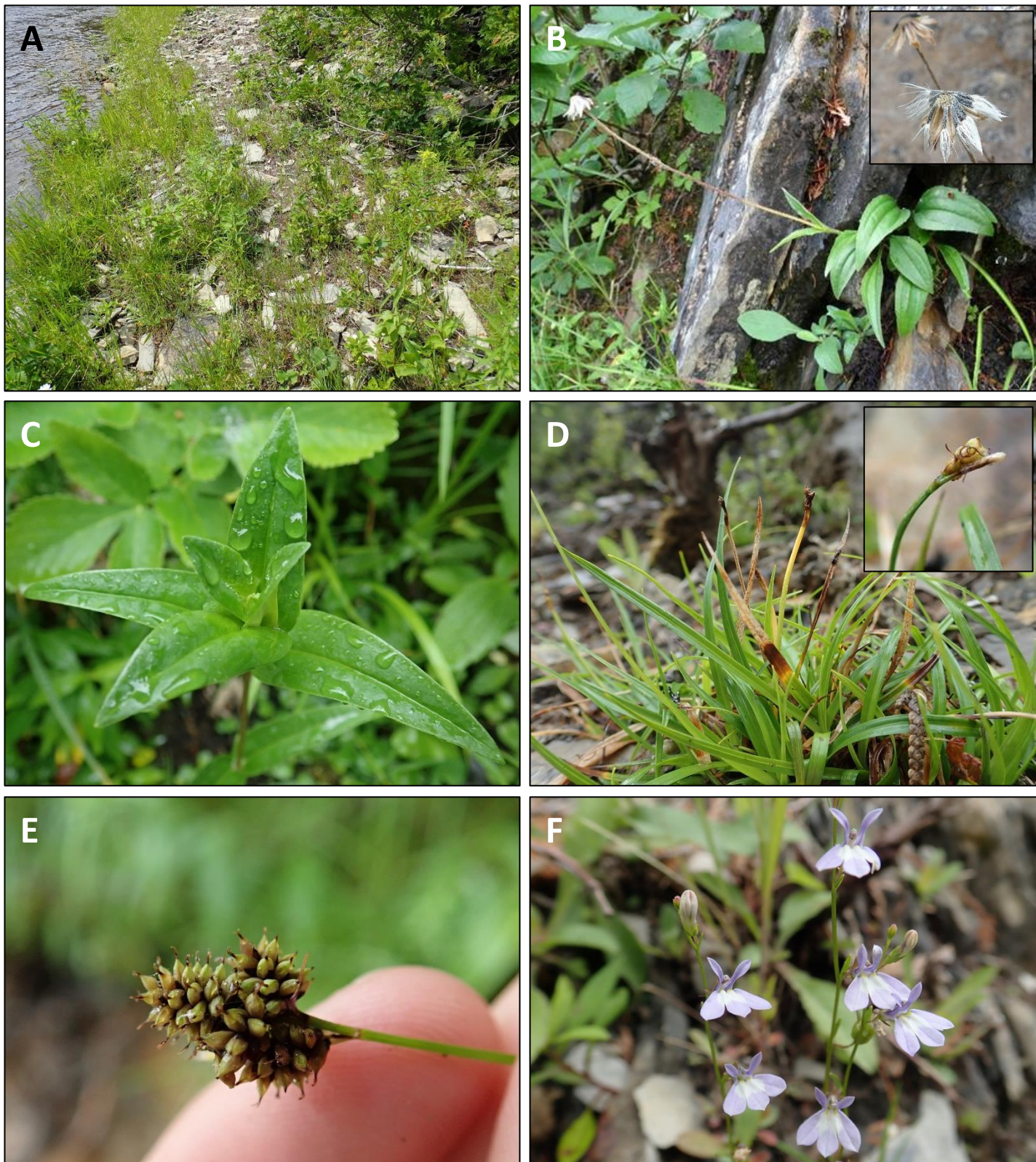


Figure 15. Northwest Upsalquitch River. A) Seepy calcareous cobble pavement shore supporting provincially rare calciphilic plant community. **B)** Northern Arnica (*Arnica lonchophylla*, S1 – Critically Imperiled) on calcareous bedrock outcrop. **C)** Purple-stemmed Gentian (*Gentiana rubricaulis*, S1 – Critically Imperiled) on moist slightly calcareous ledge along shore. **D)** Beautiful Sedge (*Carex concinna*, S1 – Critically Imperiled) on steep slope, growing on small loose material from alkaline bedrock outcrop above. **E)** Intermediate Sedge (*Carex media*, S1 – Critically Imperiled) on moist calcareous shoreline ledge. **F)** Kalm's Lobelia (*Lobelia kalmii*, S3 – Vulnerable) on calcareous shoreline outcrop.

NARROWS BROOK

Survey date: August 24th 2018

Observer(s): D.M. Mazerolle

Survey track length: 9.1 km

Total number of rare species documented: 11

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
192	175	17	91	9	9

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2	5
	<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2	1
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	8
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	3
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	4
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	9
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	4
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	4
LICHEN	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	1
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	4

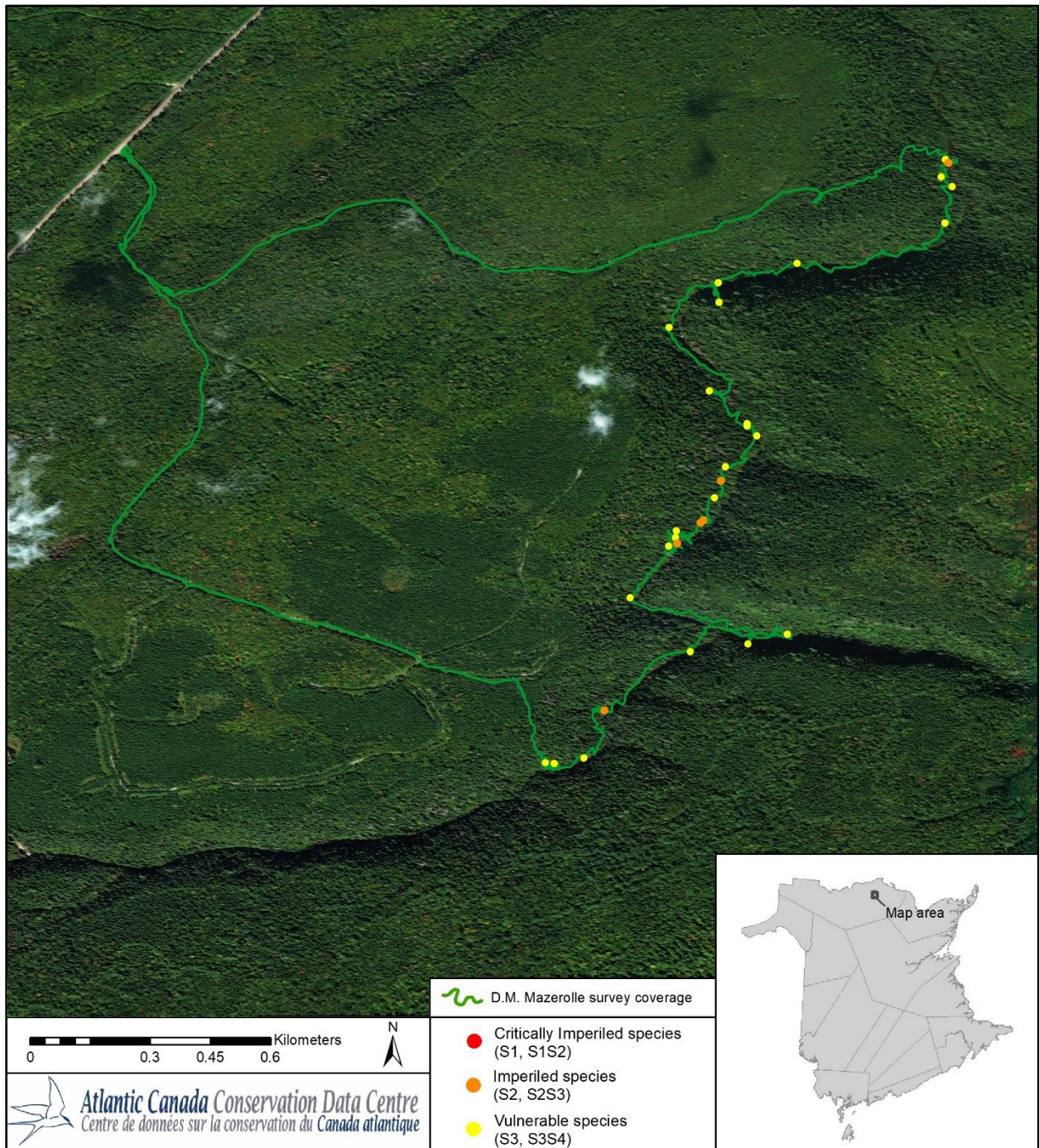


Figure 16. Survey coverage and rare species locations documented along Narrows Brook, Restigouche County, NB, on August 24th 2018. Aerial imagery from ESRI, 2019.



Figure 17. Narrows Brook. A) Large old Eastern White Cedar (*Thuja occidentalis*) growing on calcareous bedrock outcrop on very steep ravine slope. **B)** Mature mixed forest on steep valley slopes. **C)** Flat calcareous bedrock outcrop forming brook bed in area of extensive outcrops and cliffs.

CHARLO RIVER

Survey date: August 24th 2018

Observer(s): A.G. Belliveau; C.J. Chapman; T.H. Neily

Survey track length: 22.4 km

Total number of rare species documented: 38

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
278	246	32	88	12	15

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Arnica lonchophylla</i>	Northern Arnica	Asteraceae	S1	1
	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Aspleniaceae	S2	3
	<i>Carex concinna</i>	Beautiful Sedge	Cyperaceae	S2	2
	<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2	1
	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress	Brassicaceae	S3	3
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	13
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	40
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	1
	<i>Carex tuckermanii</i>	Tuckerman's Sedge	Cyperaceae	S3	1
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	1
	<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3	1
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	41
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	5
<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	1	
LICHEN	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	Pannariaceae	S2	1
	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen	Nephromataceae	S2	1
	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2	3
	<i>Nephroma arcticum</i>	Arctic Kidney Lichen	Nephromataceae	S2?	2
	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen	Collemataceae	S3	1
	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3	3
	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	12

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
LICHEN	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	4
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	3
	<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen	Pannariaceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss- shingle Lichen	Pannariaceae	S3S4	5
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	2
BRYOPHYTE	<i>Didymodon ferrugineus</i>	Shortleaf Bristle Moss	Pottiaceae	S2	1
	<i>Bryum uliginosum</i>	Cernuous Thread- moss	Bryaceae	S2S3	1
	<i>Hypnum cupressiforme</i> var. <i>filiforme</i>	Cypress-leaved Plaitmoss	Hypnaceae	S2S3	1
	<i>Orthotrichum speciosum</i>	Showy Bristle Moss	Orthotrichaceae	S2S3	1
	<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3	2
	<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss	Pottiaceae	S3	1
	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4	2
	<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss	Pterigynandraceae	S3S4	1
	<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4	2
	<i>Trichostomum tenuirostre</i>	Acid-Soil Moss	Pottiaceae	S3S4	1

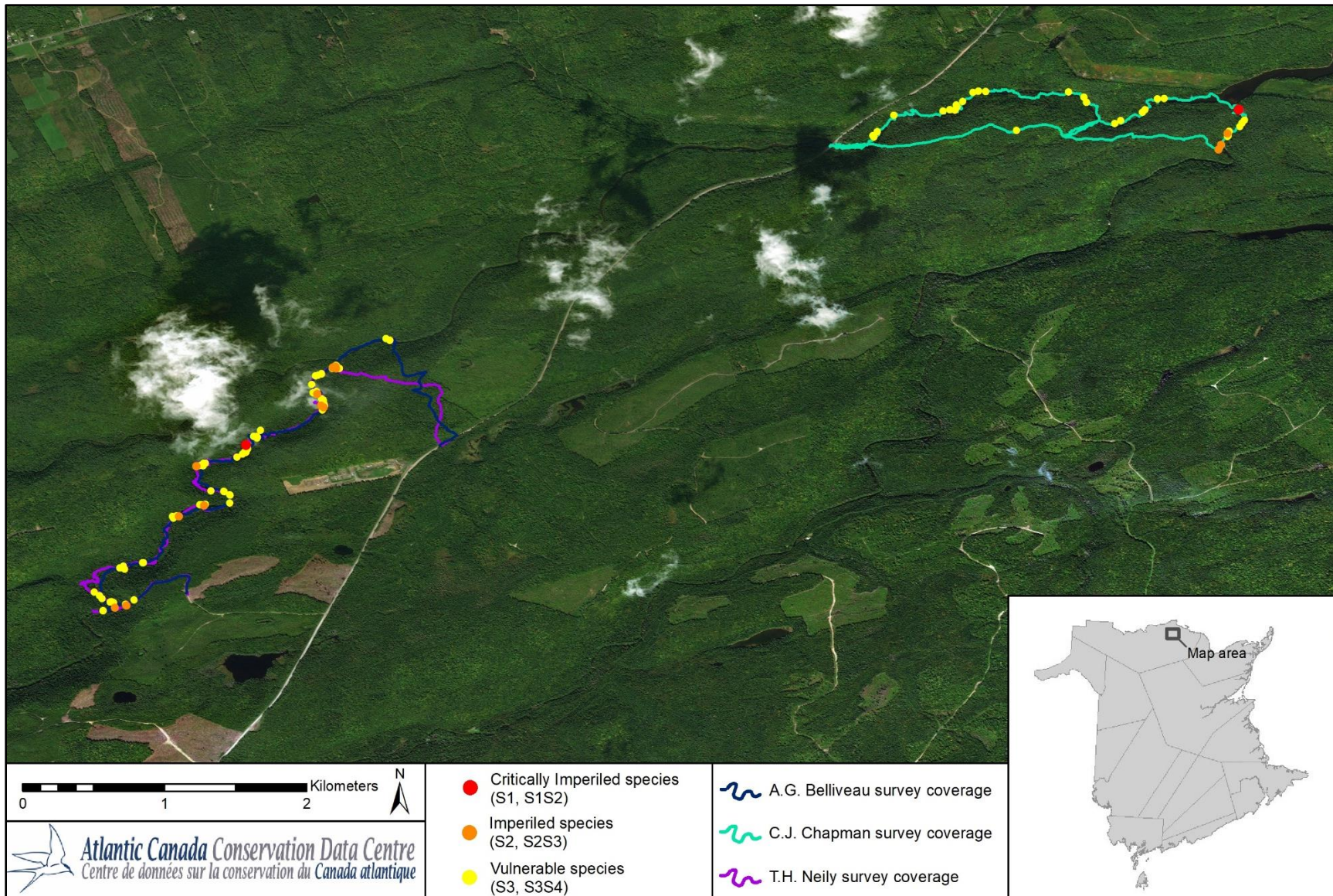


Figure 18. Survey coverage and rare species locations documented along the Charlo River, Restigouche County, NB, on August 24th 2018. Aerial imagery from ESRI, 2019.

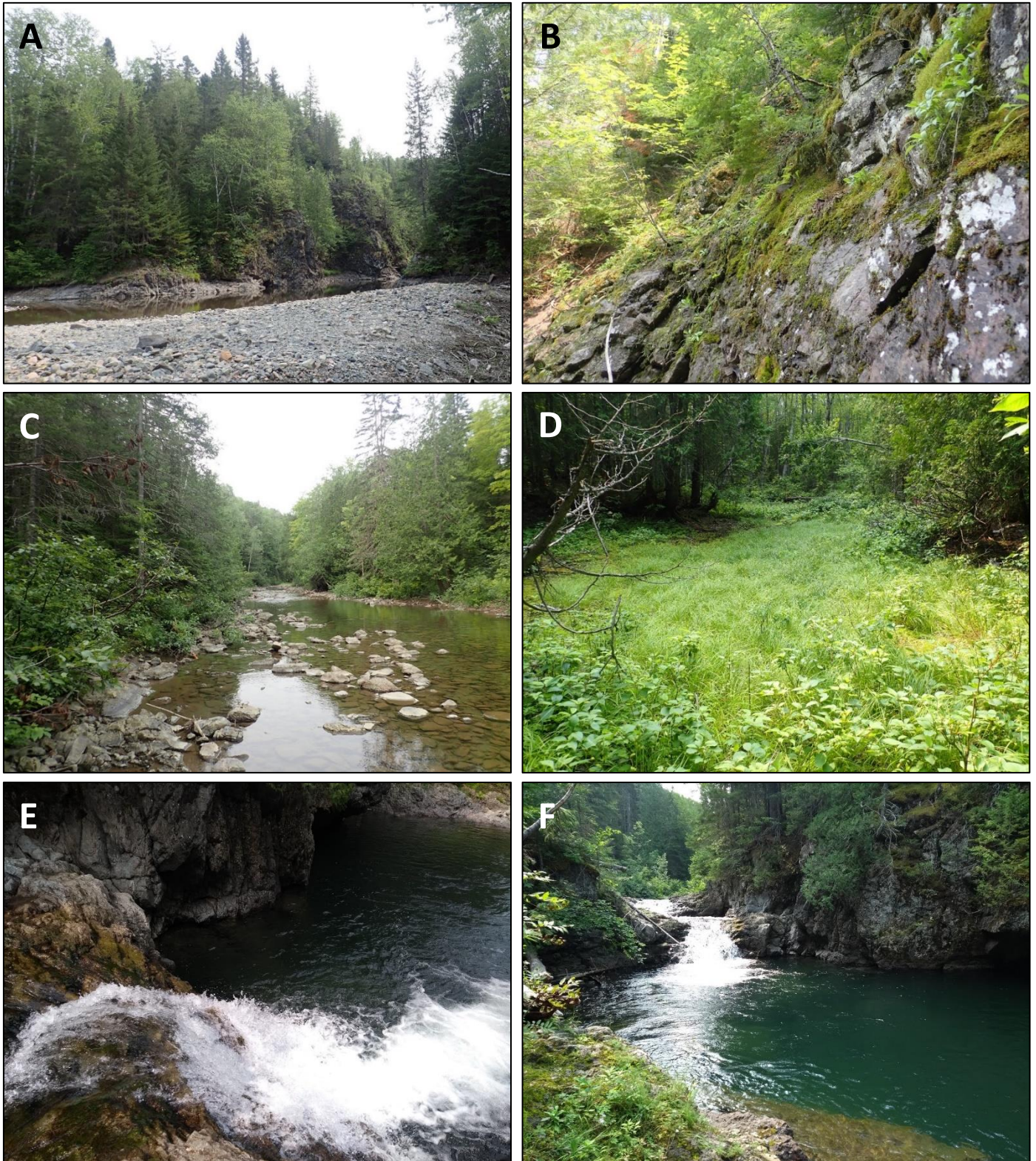


Figure 19. Charlo River. **A)** Wide gravel and cobble bars and large alkaline outcrop. **B)** Face of alkaline bedrock outcrop supporting Northern Arnica (*Arnica lonchophylla*, S1 – Critically Imperiled). **C)** Shallow river section through wider gently-sloping valley with mature coniferous floodplain forest. **D)** Rich calcareous floodplain backwater meadow supporting Tuckerman’s Sedge (*Carex tuckermanii*, S3 – Vulnerable) and Alder-leaved Buckthorn (*Endotropis alnifolia*). **E)** Waterfall over bedrock outcrop flowing into deep pool. **F)** Extensive alkaline bedrock outcrops and deep pool below waterfall.

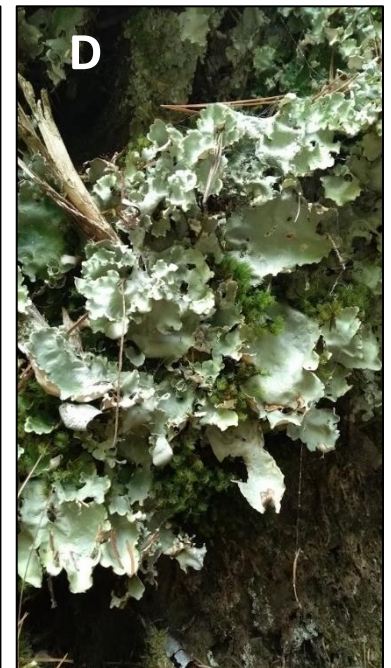
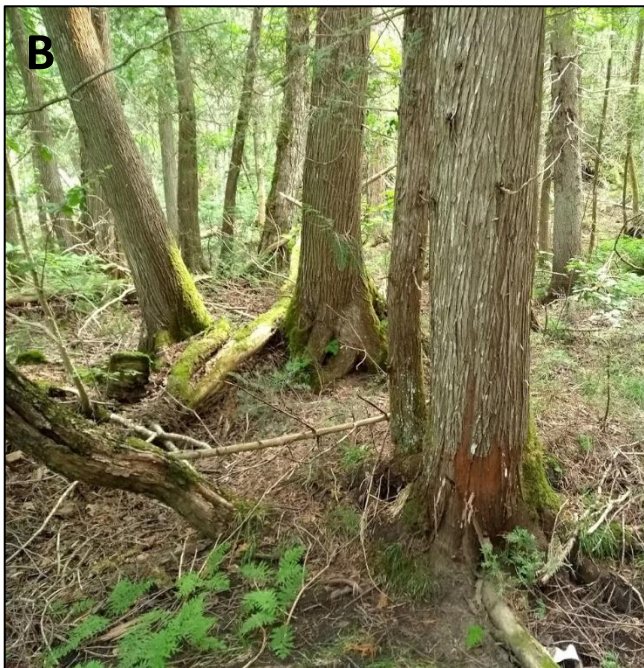


Figure 20. Charlo River. A) Area of extensive calcareous bedrock outcrops and mature coniferous forest dominated by White Spruce (*Picea glauca*) and Eastern White Cedar (*Thuja occidentalis*). **B)** Mature Eastern White Cedar swamp. **C)** Scaly Pelt Lichen (*Peltigera lepidophora*, S2 – Imperiled) on calcareous bedrock outcrop. **D)** Arctic Kidney Lichen (*Nephroma arcticum*, S2? – Imperiled) on calcareous bedrock outcrop.

SOUTH CHARLO RIVER

Survey date: August 21st 2018

Observer(s): A.G. Belliveau; C.J. Chapman; D.M. Mazerolle; T.H. Neily

Survey track length: 35.5 km

Total number of rare species documented: 46

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
302	258	44	85	15	22

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Poa interior</i>	Inland Bluegrass	Poaceae	S1	1
	<i>Draba arabisans</i>	Rock Whitlow-Grass	Brassicaceae	S1	2
	<i>Polystichum lonchitis</i>	Northern Holly Fern	Dryopteridaceae	S1	1
	<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2	15
	<i>Carex albicans var. emmonsii</i>	White-tinged Sedge	Cyperaceae	S2	1
	<i>Poa glauca</i>	Glaucous Blue Grass	Poaceae	S2	1
	<i>Viola novae-angliae</i>	New England Violet	Violaceae	S2	7
	<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2	3
	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress	Brassicaceae	S3	1
	<i>Arnica lanceolata</i>	Lance-leaved Arnica	Asteraceae	S3	4
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	72
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	9
	<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3	17
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	26
	<i>Clematis occidentalis</i>	Purple Clematis	Ranunculaceae	S3	6
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	27
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	2
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	90
	<i>Huperzia appressa</i>	Mountain Firmoss	Lycopodiaceae	S3	2
	<i>Trichophorum clintonii</i>	Clinton's Clubrush	Cyperaceae	S3	14
<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	7	
<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	10	
LICHEN	<i>Collema tenax</i>	Soil Tarpaper Lichen	Collemaataceae	S1	1
	<i>Leptogium intermedium</i>	Forty-five Jellyskin Lichen	Collemaataceae	S1	4
	<i>Leptogium schraderi</i>	Schrader's Jellyskin Lichen	Collemaataceae	S1	1

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
LICHEN	<i>Peltigera venosa</i>	Fan Pelt Lichen	Peltigeraceae	S1?	2
	<i>Thermutis velutina</i>	Rockvelvet Lichen	Lichinaceae	S1?	1
	<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen	Cystocoleaceae	S1S2	1
	<i>Leptogium gelatinosum</i>	Rose-petalled Jellyskin Lichen	Collemataceae	S1S2	2
	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2	3
	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3	2
	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	13
	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen	Collemataceae	S3?	1
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	15
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	2
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	8
BRYOPHYTE	<i>Pseudoleskeella tectorum</i>	Rooftop Leskea Moss	Leskeaceae	S1	1
	<i>Seligeria brevifolia</i>	Shortleaf Bristle Moss	Seligeriaceae	S1S2	3
	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss	Mniaceae	S2S3	2
	<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3	3
	<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss	Pottiaceae	S3	2
	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss	Pottiaceae	S3S4	1
	<i>Fissidens bryoides</i>	Lesser Pocket Moss	Fissidentaceae	S3S4	2
<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4	1	
BIRD	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Anatidae	S1B, S1S2N, S2M	1

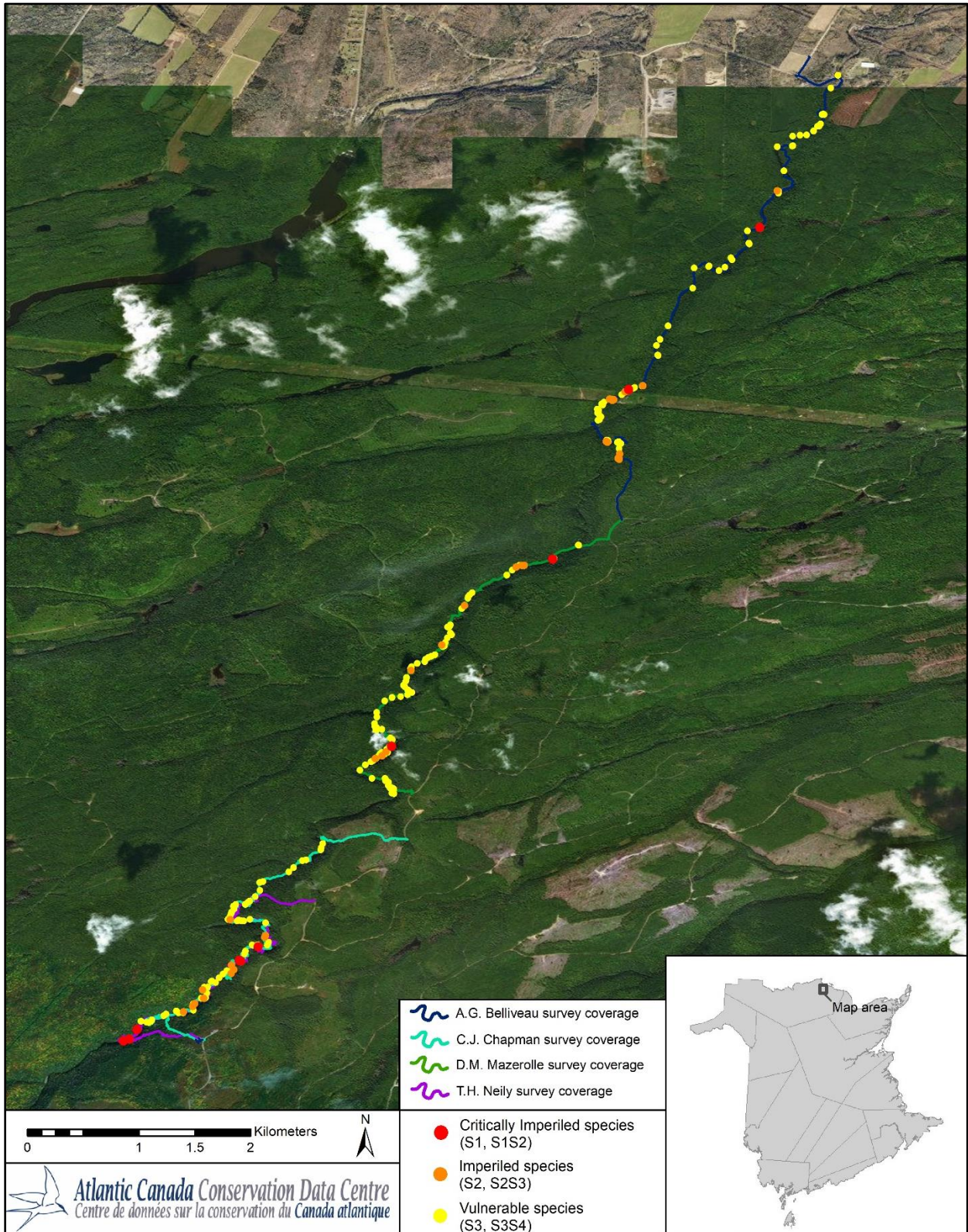


Figure 21. Survey coverage and rare species locations documented along the South Charlo River, Restigouche County, NB, on August 21st 2018. Aerial imagery from ESRI, 2019.

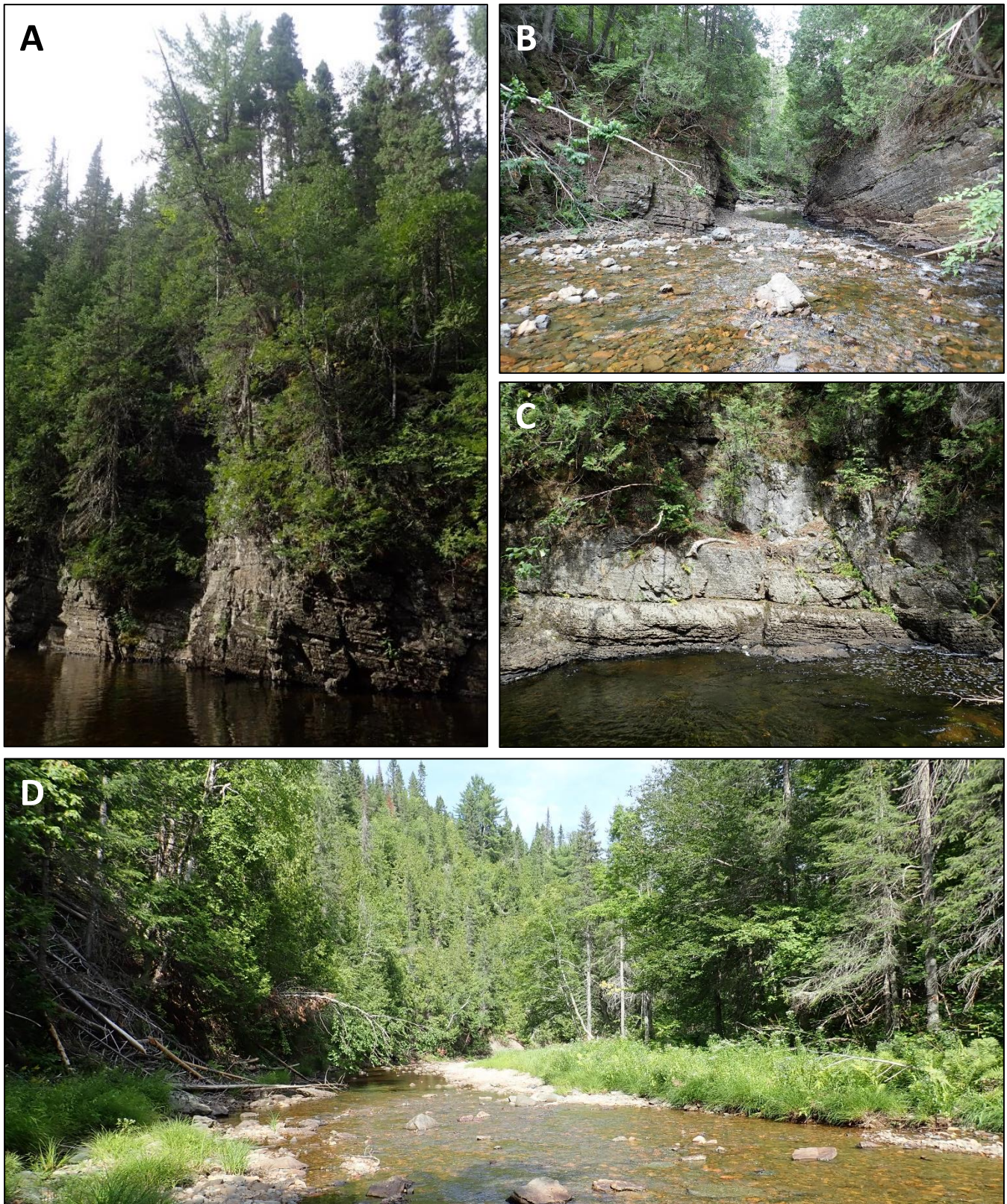


Figure 22. South Charlo River. A – C) Extensive calcareous bedrock outcrops forming sheer cliffs and narrow gorges. **D)** Shoreline graminoid and forb meadows and mature forest of White Spruce (*Picea glauca*), Eastern White Cedar (*Thuja occidentalis*), Yellow Birch (*Betula alleghaniensis*) and Balsam Fir (*Abies balsamea*) in floodplain and lower valley slopes.



Figure 23. South Charlo River. A) Vegetative rosette of Rock Whitlow-grass (*Draba arabisans*, S1 – Critically Imperiled) on calcareous outcrop ledge. **B)** Narrow winding gorge of extensive calcareous bedrock outcrops and cliffs. **C)** Northern Holly Fern (*Polystichum lonchitis*, S1 – Critically Imperiled) and Green Spleenwort (*Asplenium viride*, S3 – Vulnerable) on steep semi-forested mesic slope below calcareous outcrops. **D)** Close-up of Northern Holly Fern frond. The South Charlo River gorge is the only site known to support the species in NB. **E)** Inland Bluegrass (*Poa interior*, S1? – Critically Imperiled) collected on ledge of calcareous cliff along river. This represents the first and only documented occurrence of this northern species in NB.

SOUTH BRANCH BENJAMIN RIVER

Survey date: August 22nd 2018

Observer(s): C.J. Chapman; D.M. Mazerolle; T.H. Neily

Survey track length: 35.2 km

Total number of rare species documented: 30

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
297	254	43	86	14	12

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Moehringia macrophylla</i>	Large-Leaved Sandwort	Caryophyllaceae	S1	1
	<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2	7
	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Aspleniaceae	S2	1
	<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	Orchidaceae	S2	1
	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress	Brassicaceae	S3	2
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	2
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	7
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	9
	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3	6
	<i>Huperzia appressa</i>	Mountain Firmoss	Lycopodiaceae	S3	1
	<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3	4
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	2
LICHEN	<i>Ephebe solida</i>	Rockshag Lichen	Lichinaceae	S1	1
	<i>Ephebe perspinulosa</i>	Thread Lichen	Lichinaceae	S1	1
	<i>Phaeophyscia decolor</i>	Lesser Eye Shadow Lichen	Physciaceae	S1	2
	<i>Nephroma laevigatum</i>	Mustard Kidney Lichen	Nephromataceae	S2	1
	<i>Nephroma arcticum</i>	Arctic Kidney Lichen	Nephromataceae	S2?	2
	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3	2
	<i>Cladina terrae-novae</i>	Newfoundland Reindeer Lichen	Cladoniaceae	S3S4	1
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	6
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	3

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
BRYOPHYTE	<i>Campylium radicale</i>	Long-stalked Fine Wet Moss	Amblystegiaceae	S1S2	1
	<i>Hygrohypnum bestii</i>	Best's Brook Moss	Amblystegiaceae	S1S2	1
	<i>Bryum uliginosum</i>	Cernuous Thread- moss	Bryaceae	S2S3	1
	<i>Hypnum cupressiforme</i> var. <i>filiforme</i>	Cypress-leaved Plaitmoss	Hypnaceae	S2S3	1
	<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3	1
	<i>Abietinella abietina</i>	Wiry Fern Moss	Thuidiaceae	S3S4	1
	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4	1
BIRD	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	1

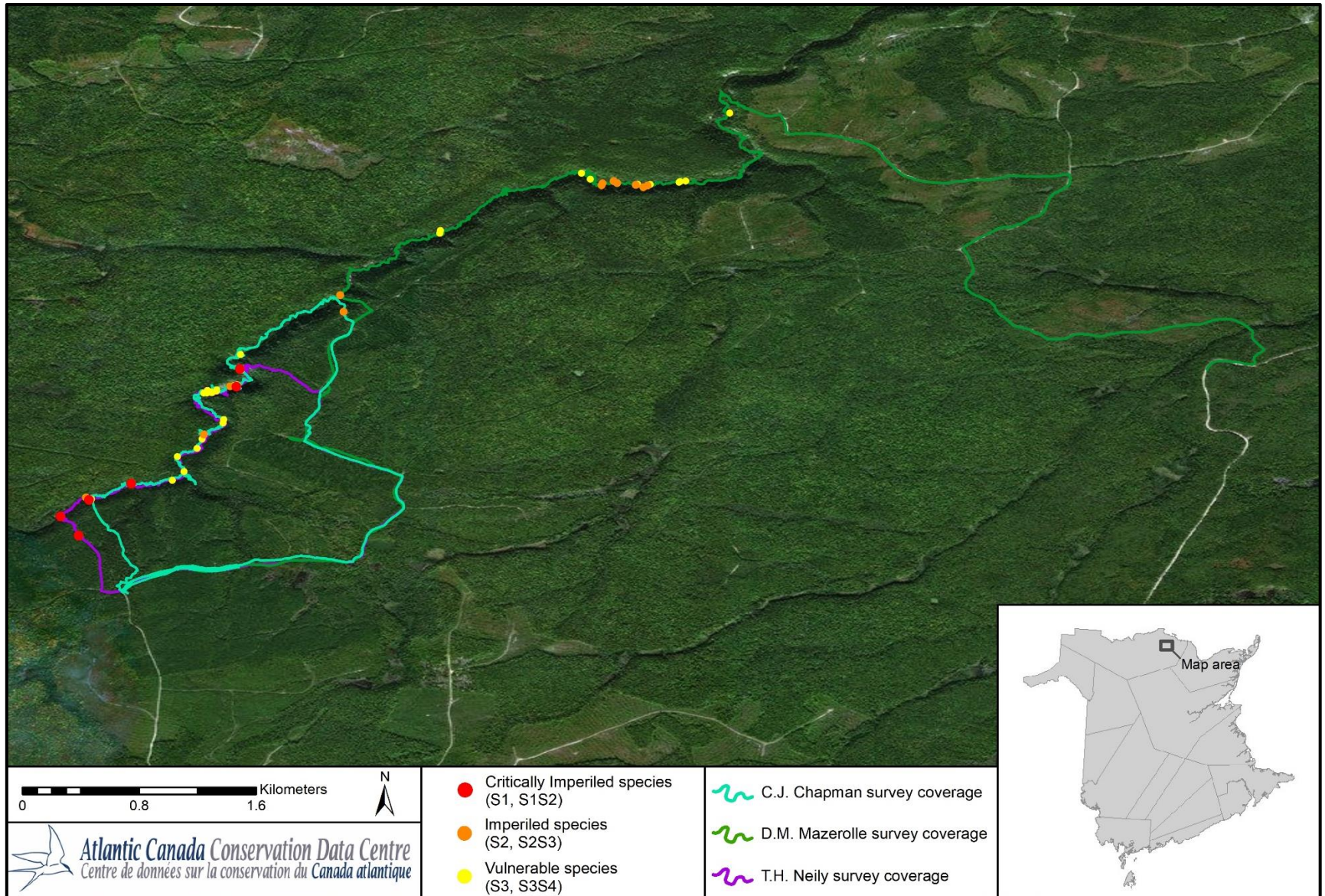


Figure 24. Survey coverage and rare species locations documented along the South Branch Benjamin River, Restigouche County, NB, on August 22nd 2018. Aerial imagery from ESRI, 2019.



Figure 25. South Branch Benjamin River. A) and B) Abrupt ravine formed of exposed calcareous bedrock, with mature coniferous and mixed forest on steep slopes. **C)** Extensive slightly alkaline cliff face along brook. **D)** Northern Bent Grass (*Agrostis mertensii*, S2 – Imperiled) on alkaline shoreline bedrock outcrop. **E)** Mature mixed riparian forest in wider ravine bottom. **F)** Scabrous Black Sedge (*Carex atratiformis*, S3 – Vulnerable) growing on moist calcareous ledge along brook. **G)** Sparsely-vegetated scree field on upper ravine slope.

LOUISON RIVER

Survey date: August 22nd 2018

Observer(s): A.G. Belliveau

Survey track length: 11 km

Total number of rare species documented: 12

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
184	158	26	86	14	6

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Moehringia macrophylla</i>	Large-Leaved Sandwort	Caryophyllaceae	S1	2
	<i>Poa glauca</i>	Glaucous Blue Grass	Poaceae	S2	1
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	5
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	3
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	2
LICHEN	<i>Peltigera venosa</i>	Fan Pelt Lichen	Peltigeraceae	S1?	1
	<i>Nephroma arcticum</i>	Arctic Kidney Lichen	Nephromataceae	S2?	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	2
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	1
BIRD	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM	1

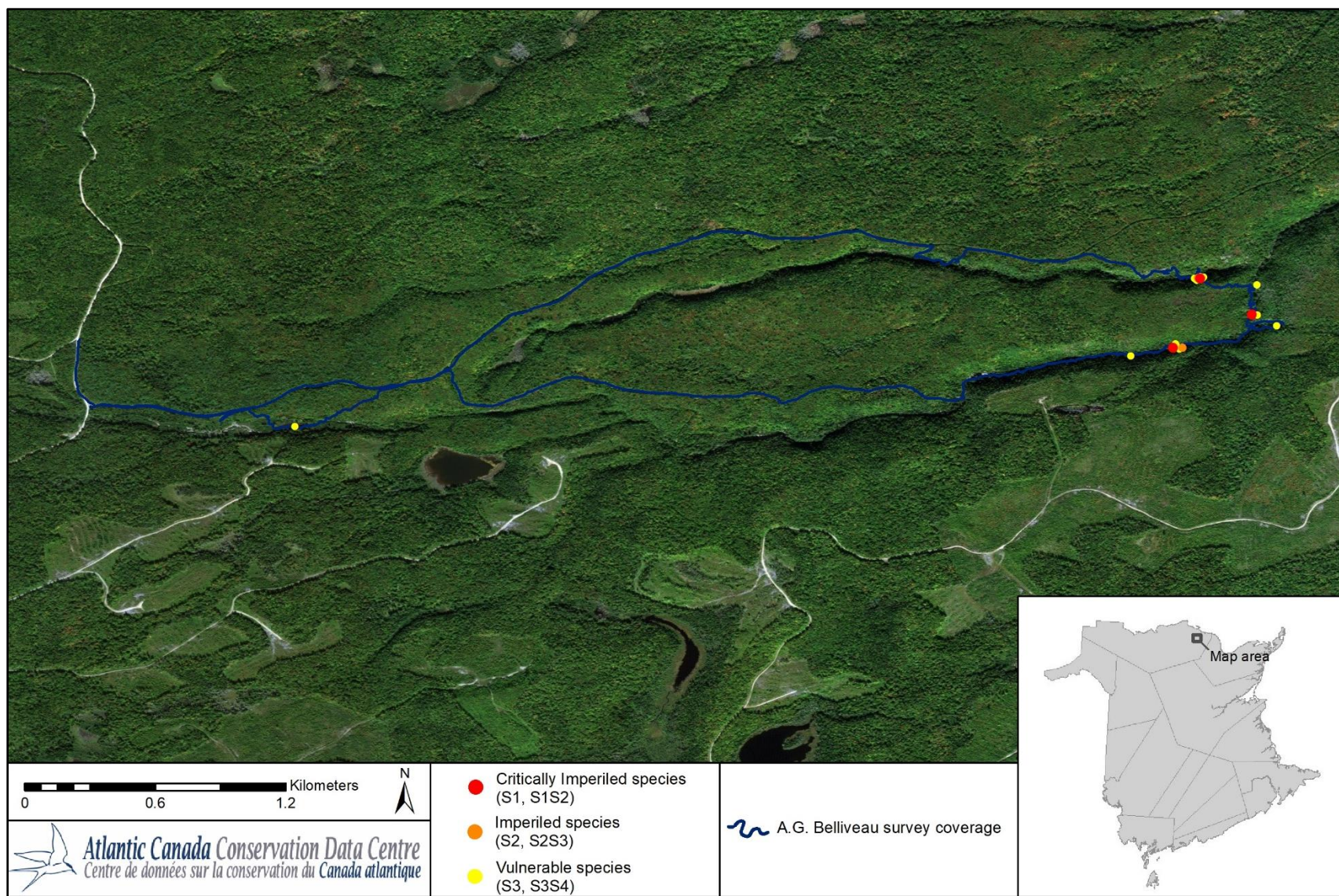


Figure 26. Survey coverage and rare species locations documented along the Louison River, Restigouche County, NB, on August 22nd 2018. Aerial imagery from ESRI, 2019.

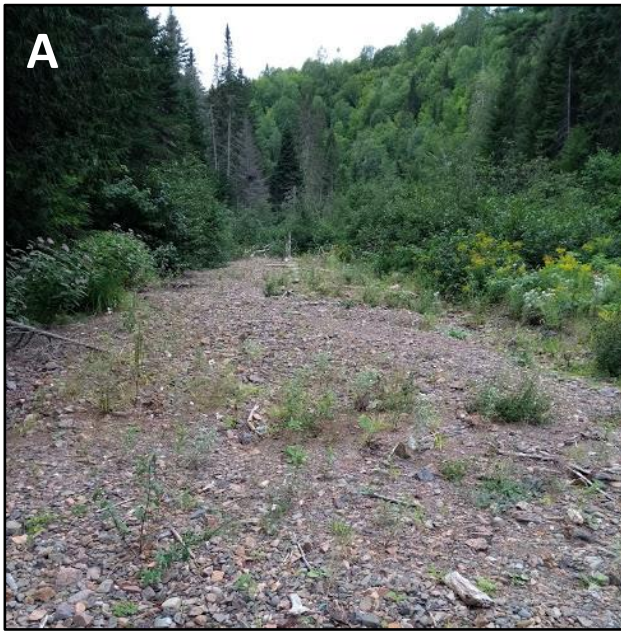


Figure 27. Louison River. **A)** Dry cobble and gravel valley bottom in upper reaches of river valley. **B)** Calcareous bedrock outcrop on valley slope. **C)** Cobble bars, shrubby thickets and mature mixed forest along river. **D)** Mature mixed forest on steep valley slope. **E)** Glaucous Bluegrass (*Poa glauca*, S2 – Vulnerable) on calcareous outcrop. **F)** Large-leaved Sandwort (*Moehringia macrophylla*, S1 – Critically Imperiled) on mesic mossy ledge near calcareous outcrops.

LOWER MCNAIR BROOK

Survey date: August 23rd 2018

Observer(s): A.G. Belliveau; D.M. Mazerolle

Survey track length: 15.4 km

Total number of rare species documented: 11

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
233	203	30	87	13	7

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Allium tricoccum</i>	Wild Leek	Liliaceae	S2	1
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	1
	<i>Carex ormostachya</i>	Necklace Spike Sedge	Cyperaceae	S3	1
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	3
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	5
	<i>Gentianella amarella</i>	Northern Gentian	Gentianaceae	S3	1
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	2
LICHEN	<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	5
	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	1
BIRD	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M	1

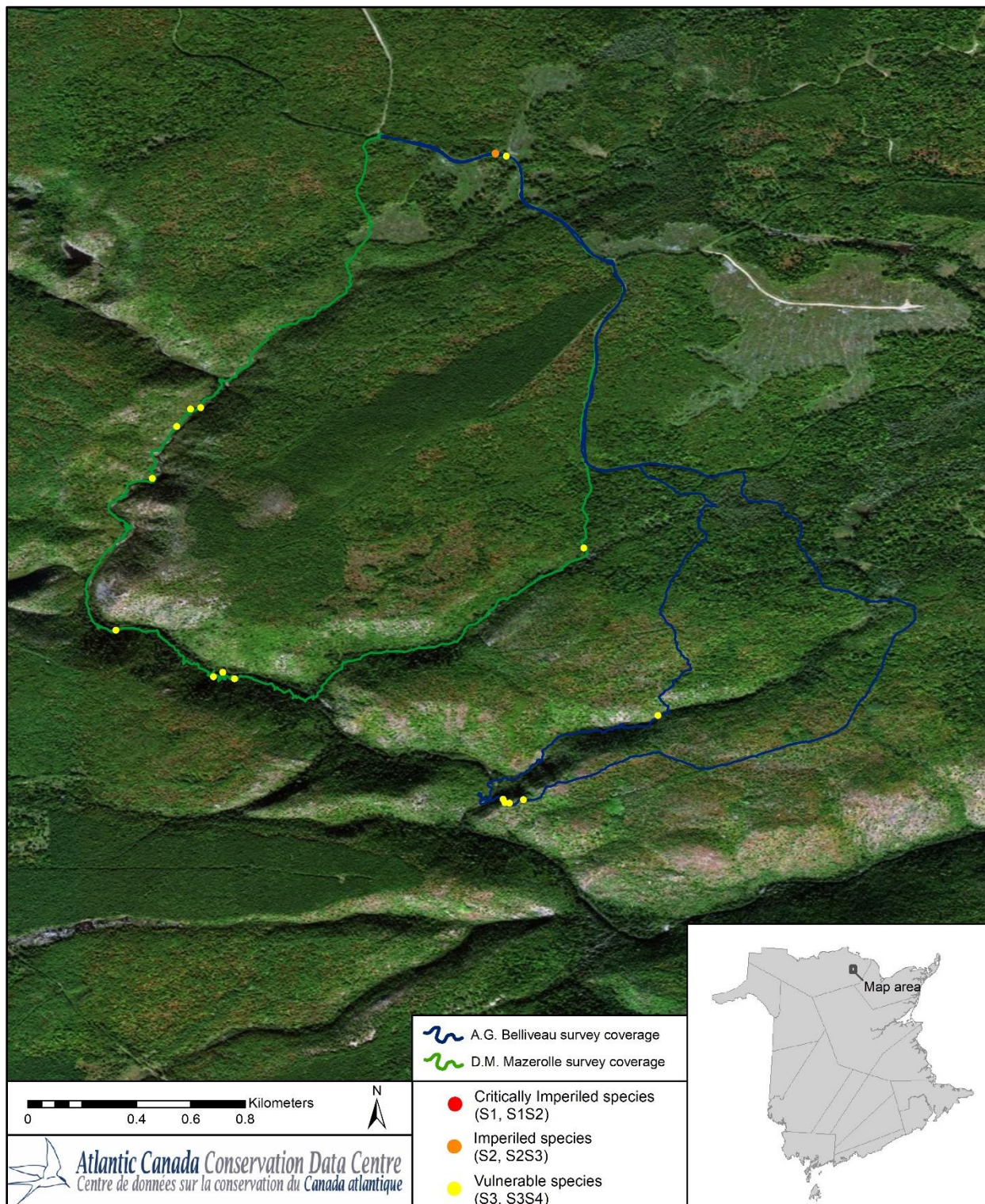


Figure 28. Survey coverage and rare species locations documented along Lower McNair Brook, Restigouche County, NB, on August 23rd 2018. Aerial imagery from ESRI, 2019.



Figure 29. Lower McNair Brook. **A)** West-facing view of river valley from clifftop, showing sparsely-forested slope regenerating after extensive forest fire. **B)** Open scree slope, with young forest regenerating after forest fire. **C)** Bouldery brook section with shoreline thickets and mixed forest regenerating after forest fire. **D)** Northern Gentian (*Gentianella amarella*, S3 – Vulnerable) growing in moist mineral soil of trail margin. **E)** Calcareous bedrock cliff face on steep valley slope. **F)** Mature Sugar Maple (*Acer saccharum*)-dominated forest on plateau above brook valley.

UPPER MCNAIR BROOK

Survey date: August 23rd 2018

Observer(s): C.J. Chapman; T.H. Neily

Survey track length: 15.1 km

Total number of rare species documented: 24

Vascular Plant Diversity:

Total Spp. Richness	Native Spp. Richness	Exotic Spp. Richness	% Native	% Exotic	# of Rare Spp.
204	179	25	88	12	10

Rare Species Documented:

	SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Number of Locations Documented
VASCULAR PLANT	<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2	8
	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Aspleniaceae	S2	2
	<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2	3
	<i>Arnica lanceolata</i>	Lance-leaved Arnica	Asteraceae	S3	1
	<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	4
	<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	1
	<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3	1
	<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	3
	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern	Dryopteridaceae	S3	7
	<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	3
LICHEN	<i>Leptogium gelatinosum</i>	Rose-petalled Jellyskin Lichen	Collemaaceae	S1S2	1
	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2	1
	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen	Cladoniaceae	S3	1
	<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3	1
	<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	4
	<i>Melanelia panniformis</i>	Shingled Camouflage Lichen	Parmeliaceae	S3S4	1
	<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	1
	<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	1
	<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4	2
BRYOPHYTE	<i>Orthotrichum speciosum</i>	Showy Bristle Moss	Orthotrichaceae	S2S3	1
	<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3	2
	<i>Abietinella abietina</i>	Wiry Fern Moss	Thuidiaceae	S3S4	1
	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4	1
	<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4	1

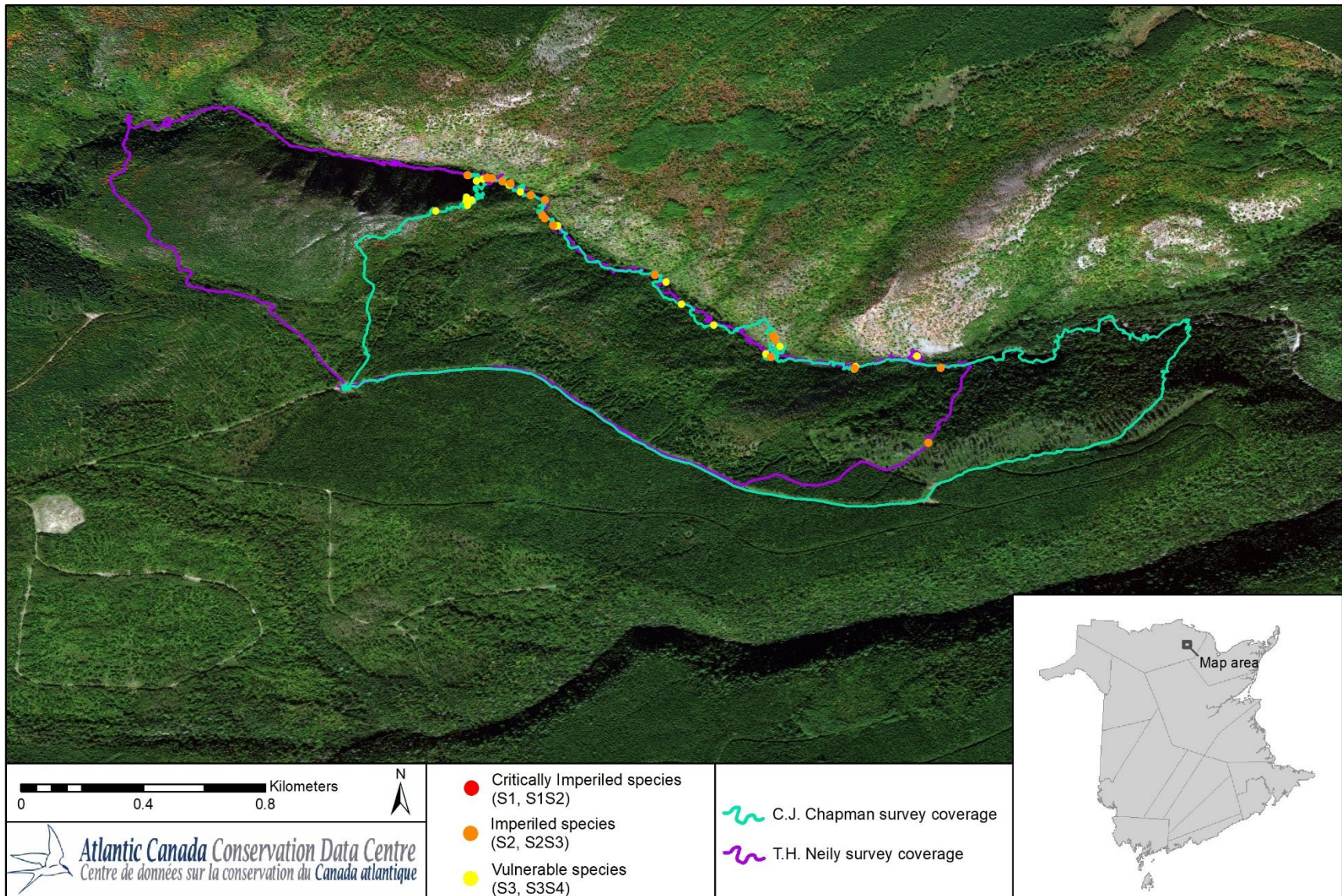


Figure 30. Survey coverage and rare species locations documented along Upper McNair Brook, Restigouche County, NB, on August 23rd 2018. Aerial imagery from ESRI, 2019.

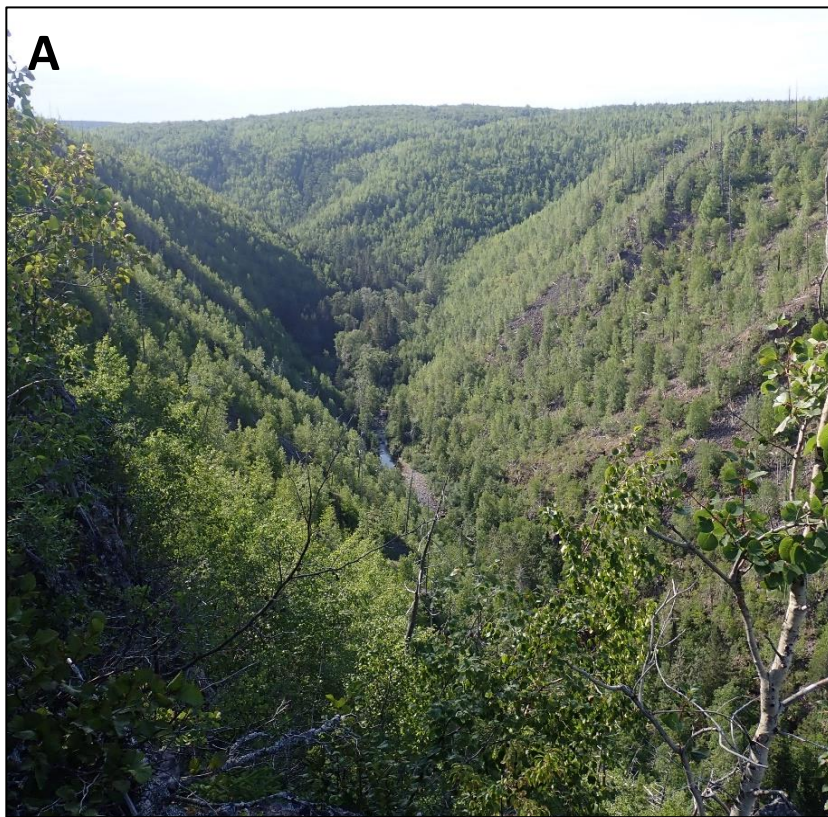


Figure 31. Upper McNair Brook. **A)** East-facing view of brook valley showing sparsely-forested slope regenerating after extensive forest fire. **B)** Valley slope with sparse forest regenerating after forest fire, with areas showing significant soil erosion. **C)** Boulder and cobble shore, shrubby shoreline thickets and mature coniferous forest dominated by White Spruce (*Picea glauca*). **D)** Mature deciduous riparian forest dominated by Yellow Birch (*Betula alleghaniensis*).

APPENDIX 1. NatureServe status ranks and definitions

Source: <http://www.natureserve.org/conservation-tools/conservation-status-assessment>

Global Rank	National Rank	Provincial Rank	DEFINITION
GX	NX	SX	Presumed Extinct (G-rank) / Extirpated (N- and S-ranks) — Species or ecosystem not located despite intensive searches and virtually no likelihood of rediscovery.
GH	NH	SH	Possibly Extinct (G-rank) / Extirpated (N- and S-ranks) — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct or the ecosystem may be eliminated throughout its range, but not enough to state this with certainty.
G1	N1	S1	Critically Imperiled — At very high risk of extinction (G-rank) / extirpation (N- and S-ranks) due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	N2	S2	Imperiled — At high risk of extinction (G-rank) / extirpation (N- and S-ranks) due to very restricted range, very few populations, steep declines, or other factors.
G3	N3	S3	Vulnerable — At moderate risk of extinction (G-rank) / extirpation (N- and S-ranks) due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4	N4	S4	Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	N5	S5	Secure — Common; widespread and abundant.

APPENDIX 2. Full list of vascular plants documented during surveys, with provincial status ranks (S-rank, see Appendix 1 for definitions) and abundance at each survey site (c = common, fc = fairly common to common, f = fairly common, l = locally common, u = uncommon, rl = rare overall but locally common, ru = rare to uncommon, r = rare; a dot indicates that the species was recorded but abundance was not noted). Additional information on the on-site abundance of provincially rare species can be found in *Site Summaries*.

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Dendrolycopodium dendroideum</i>	Round-branched Tree-clubmoss	Lycopodiaceae	S5	•	r	u	f	•	r	•					•		r
<i>Dendrolycopodium hickeyi</i>	Hickey's Tree-clubmoss	Lycopodiaceae	S4												•		
<i>Diphasiastrum digitatum</i>	Southern Ground-cedar	Lycopodiaceae	S5									r	r		•		r
<i>Diphasiastrum tristachyum</i>	Blue Ground-cedar	Lycopodiaceae	S4S5														r
<i>Huperzia appressa</i>	Mountain Firmoss	Lycopodiaceae	S3										r	r			
<i>Huperzia lucidula</i>	Shining Firmoss	Lycopodiaceae	S5			u	f				•	•			•		r
<i>Lycopodium annotinum</i>	Stiff Clubmoss	Lycopodiaceae	S5		r				r		r				•	•	u
<i>Lycopodium clavatum</i>	Running Clubmoss	Lycopodiaceae	S5												•	r	•
<i>Lycopodium lagopus</i>	One-cone clubmoss	Lycopodiaceae	S4														•
<i>Isoetes echinospora</i>	Spiny-Spored Quillwort	Isoetaceae	S5									r					
<i>Equisetum arvense</i>	Field Horsetail	Equisetaceae	S5	•	f	c	c	•	c	c	r	c	r	f	•	f	•
<i>Equisetum fluviatile</i>	Water Horsetail	Equisetaceae	S5			r				•							
<i>Equisetum pratense</i>	Meadow Horsetail	Equisetaceae	S4			u				•							
<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush	Equisetaceae	S4			r	r	•		r							
<i>Equisetum sp.</i>	a horsetail	Equisetaceae	-			•											
<i>Equisetum sylvaticum</i>	Woodland Horsetail	Equisetaceae	S5		f	u	u	•		c	c	u	c	r	•	f	c
<i>Botrypus virginianus</i>	Rattlesnake Fern	Ophioglossaceae	S4			r				•		•	r	r			
<i>Osmunda claytoniana</i>	Interrupted Fern	Osmundaceae	S5		c	c	f	•	f	•	c	c	c	c	•	c	•
<i>Osmundastrum cinnamomeum</i>	Cinnamon Fern	Osmundaceae	S5										c		•		
<i>Polypodium appalachianum</i>	Appalachian Polypody	Polypodiaceae	S3	•													
<i>Polypodium virginianum</i>	Rock Polypody	Polypodiaceae	S5		r	u	r				f	u	u	f	•	r	•

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Pteridium aquilinum var. latiusculum</i>	Bracken Fern	Dennstaedtiaceae	S5	•	c	c	c	•	c	c	c	u	c	c	•	c	c
<i>Cryptogramma stelleri</i>	Steller's Rockbrake	Pteridaceae	S3	•			r		r	•	r		fc		•	r	r
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Aspleniaceae	S2									r		r			r
<i>Asplenium viride</i>	Green Spleenwort	Aspleniaceae	S3	•	•		r			•	r	r	c	r	•	r	r
<i>Phegopteris connectilis</i>	Northern Beech Fern	Thelypteridaceae	S5	•	c	c	c	•	c	c	c	•	c	c	•	c	c
<i>Thelypteris noveboracensis</i>	New York Fern	Thelypteridaceae	S5				u		f	f			r				
<i>Thelypteris palustris var. pubescens</i>	Eastern Marsh Fern	Thelypteridaceae	S5									r		u			
<i>Athyrium filix-femina var. angustum</i>	Northeastern Lady Fern	Dryopteridaceae	S5	•	c	c	f	•	c	c	c	c	c	c	•	c	c
<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern	Dryopteridaceae	S4	•		f	c	•	u	•	l	u	c	u	•	r	c
<i>Cystopteris fragilis</i>	Fragile Fern	Dryopteridaceae	S4	•					r	•		l	r	u	•	f	f
<i>Cystopteris fragilis / tenuis</i>	a bladder fern	Dryopteridaceae	-								c						
<i>Cystopteris tenuis</i>	A Bladderfern	Dryopteridaceae	S4		f								c				
<i>Deparia acrostichoides</i>	Silvery Glade Fern	Dryopteridaceae	S4		u	c						r	•			r	
<i>Dryopteris campyloptera</i>	Mountain Wood Fern	Dryopteridaceae	S5			u	u			•	c	u	f	f		c	f
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	Dryopteridaceae	S5				c			•	c		r	c	•		
<i>Dryopteris cristata</i>	Crested Wood Fern	Dryopteridaceae	S5								r						
<i>Dryopteris fragrans</i>	Fragrant Wood Fern	Dryopteridaceae	S3		r				r	•	u	•	r	r	•	r	f
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	Dryopteridaceae	S5	•	c	c	c	•	l	c	c	•	c	c	•	c	c
<i>Dryopteris marginalis</i>	Marginal Wood Fern	Dryopteridaceae	S5	•	c	c	r	•	u			c	u				c
<i>Dryopteris x boottii</i>	a Hybrid Wood-fern	Dryopteridaceae	SNA								r						
<i>Gymnocarpium dryopteris</i>	Common Oak Fern	Dryopteridaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Gymnocarpium sp.</i>	an oak fern	Dryopteridaceae	-							•							
<i>Matteuccia struthiopteris var. pennsylvanica</i>	Ostrich Fern	Dryopteridaceae	S5	•	c	c	c	•	c	c	c	•	c	l	•	c	
<i>Onoclea sensibilis</i>	Sensitive Fern	Dryopteridaceae	S5	•	c	c	c	•	c	c	c	c	•	c	•	•	

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Polystichum braunii</i>	Braun's Holly Fern	Dryopteridaceae	S4	•		f	r	•	u			r	r	•	•	r	u
<i>Polystichum lonchitis</i>	Northern Holly Fern	Dryopteridaceae	S1									r					
<i>Woodsia alpina</i>	Alpine Cliff Fern	Dryopteridaceae	S2									r	•	•			r
<i>Woodsia glabella</i>	Smooth Cliff Fern	Dryopteridaceae	S3	•						•	r	•	r	r	•	r	•
<i>Woodsia alpina / glabella</i>	a cliff fern	Dryopteridaceae	S2/S3							•							
<i>Woodsia ilvensis</i>	Rusty Cliff Fern	Dryopteridaceae	S4	•	c	u			l	•	c	r	f	c	•	c	•
<i>Taxus canadensis</i>	Canada Yew	Taxaceae	S5	•	r	r	l	•	u	•	r	c	u	f	•	•	u
<i>Abies balsamea</i>	Balsam Fir	Pinaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Larix laricina</i>	Tamarack	Pinaceae	S5					•									
<i>Picea glauca</i>	White Spruce	Pinaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Picea mariana</i>	Black Spruce	Pinaceae	S5	•	c	c	c	•	l	c		•	f	c	•		
<i>Pinus banksiana</i>	Jack Pine	Pinaceae	S5		r	•									•	•	r
<i>Pinus resinosa</i>	Red Pine	Pinaceae	S4				r			•							
<i>Pinus strobus</i>	Eastern White Pine	Pinaceae	S5	•	r	c	l	•		•	c	r	c	c	•	•	r
<i>Thuja occidentalis</i>	Eastern White Cedar	Cupressaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Actaea pachypoda</i>	White Baneberry	Ranunculaceae	S4			r	f										
<i>Actaea rubra</i>	Red Baneberry	Ranunculaceae	S5	•	f	f	c	•	c	c	c	f	f	f	•	f	
<i>Anemonastrum canadense</i>	Canada Anemone	Ranunculaceae	S5	•		u	c	•	r	f		c	c	c	•		•
<i>Anemone virginiana</i>	Virginia Anemone	Ranunculaceae	S4			r				•		u	u				
<i>Caltha palustris</i>	Yellow Marsh Marigold	Ranunculaceae	S4S5							c	u	u	c	c	•	c	f
<i>Clematis occidentalis</i>	Purple Clematis	Ranunculaceae	S3										r				
<i>Clematis virginiana</i>	Virginia Clematis	Ranunculaceae	S5	•			u		c	•		f	c	c		c	
<i>Coptis trifolia</i>	Goldthread	Ranunculaceae	S5	•	u	c	l	•		c	c	•	f	c		c	c
<i>Ranunculus abortivus</i>	Kidney-Leaved Buttercup	Ranunculaceae	S5	•		u	u	•				•	u	u	•	u	r
<i>Ranunculus acris</i>	Common Buttercup	Ranunculaceae	SNA				r	•	c	r	f	u	u	c		f	r

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE												
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.
<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Bristly Buttercup	Ranunculaceae	S4S5		f	u	f		r	u		r	r		u	
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup	Ranunculaceae	S4		u					•		r	r	r		
<i>Ranunculus recurvatus</i>	Hooked Buttercup	Ranunculaceae	S4					•		•						
<i>Ranunculus repens</i>	Creeping Buttercup	Ranunculaceae	SNA		f	u		•	u	•		u	•	l	•	c u
<i>Ranunculus trichophyllus</i>	White Water Buttercup	Ranunculaceae	S4S5											r		
<i>Ranunculus longirostris</i> / <i>subrigidus</i> / <i>trichophyllus</i>	a water buttercup	Ranunculaceae	-	•						r				r		
<i>Thalictrum pubescens</i>	Tall Meadow-Rue	Ranunculaceae	S5	•	c	f	c	•	c	c	c	c	c	c	•	c c
<i>Capnoides sempervirens</i>	Pink Corydalis	Fumariaceae	S4S5						r					r		
<i>Laportea canadensis</i>	Canada Wood Nettle	Urticaceae	S5	•				•								
<i>Urtica dioica</i>	Stinging Nettle	Urticaceae	S4	•											•	
<i>Myrica gale</i>	Sweet Gale	Myricaceae	S5		c					l		r	f			
<i>Fagus grandifolia</i>	American Beech	Fagaceae	S4									r		r	•	
<i>Quercus rubra</i>	Northern Red Oak	Fagaceae	S5												•	
<i>Alnus alnobetula</i> ssp. <i>crispa</i>	Mountain Alder	Betulaceae	S5			u			u			r	c	r		l •
<i>Alnus incana</i> ssp. <i>rugosa</i>	Speckled Alder	Betulaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c c
<i>Betula alleghaniensis</i>	Yellow Birch	Betulaceae	S5	•	c	c	c	•	r	•		c	c	c	•	c c
<i>Betula cordifolia</i>	Heart-leaved Birch	Betulaceae	S5	•		c	c	•	c	•	c		f	c		c •
<i>Betula papyrifera</i>	Paper Birch	Betulaceae	S5	•	c	c			c	c	c	c	c	c	•	c c
<i>Betula populifolia</i>	Gray Birch	Betulaceae	S5													u
<i>Corylus cornuta</i>	Beaked Hazel	Betulaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c c
<i>Chenopodium album</i>	Common Lamb's Quarters	Chenopodiaceae	SNA													r
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	Common Chickweed	Caryophyllaceae	SNA					•		•		•		•	•	
<i>Moehringia macrophylla</i>	Large-Leaved Sandwort	Caryophyllaceae	S1		r									•	•	
<i>Sagina procumbens</i>	Procumbent Pearlwort	Caryophyllaceae	S5			u	r							r	•	

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE															
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.		
<i>Silene latifolia</i>	White Champion	Caryophyllaceae	SNA														•		
<i>Silene noctiflora</i>	Night-Flowering Catchfly	Caryophyllaceae	SNA			r													c
<i>Silene vulgaris</i>	Bladder Champion	Caryophyllaceae	SNA	•	r	f	c		c	f			r				•		f
<i>Spergula arvensis</i>	Common Corn Spurrey	Caryophyllaceae	SNA						r										
<i>Spergularia rubra</i>	Ruby Sandspurrey	Caryophyllaceae	SNA		r	f													
<i>Stellaria alsine</i>	Trailing Stitchwort	Caryophyllaceae	S4				r												
<i>Stellaria borealis</i>	Boreal Stitchwort	Caryophyllaceae	S4S5			r													
<i>Stellaria media</i>	Common Starwort	Caryophyllaceae	SNA				r												
<i>Fallopia cilinodis</i>	Fringed Black Bindweed	Polygonaceae	S5	•	u	c	c		f	•		•	r				•	u	u
<i>Fallopia convolvulus</i>	Eurasian Black Bindweed	Polygonaceae	SNA															r	
<i>Persicaria hydropiper</i>	Marshpepper Smartweed	Polygonaceae	SNA		r	•	c		u	•		r	r	c				u	
<i>Persicaria lapathifolia</i>	Pale Smartweed	Polygonaceae	S5									r							
<i>Persicaria maculosa</i>	Spotted Lady's-thumb	Polygonaceae	SNA				u			•		r		r				r	r
<i>Persicaria sagittata</i>	Arrow-leaved Smartweed	Polygonaceae	S5	•			c		u					r			•		
<i>Polygonum aviculare</i>	Prostrate Knotweed	Polygonaceae	SNA										r						
<i>Polygonum sp.</i>	a knotweed	Polygonaceae	-										•						
<i>Rumex acetosella</i>	Sheep Sorrel	Polygonaceae	SNA		r	r	r	•							r			r	r
<i>Rumex britannica</i>	Greater Water Dock	Polygonaceae	S5				f						r	u		•			r
<i>Rumex crispus</i>	Curled Dock	Polygonaceae	SNA		u	u		•		r									
<i>Rumex obtusifolius</i>	Bitter Dock	Polygonaceae	SNA			r	f		r					r					
<i>Rumex occidentalis</i>	Western Dock	Polygonaceae	S2S3							r									
<i>Rumex triangulivalvis</i>	Triangular-valve Dock	Polygonaceae	S4		u	•													
<i>Hypericum boreale</i>	Northern St John's-Wort	Clusiaceae	S5		r							r							
<i>Hypericum canadense</i>	Canada St John's-wort	Clusiaceae	S5			r						r		r					

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Hypericum ellipticum</i>	Pale St John's-Wort	Clusiaceae	S5	•	c				r	r	r		r	u			
<i>Hypericum fraseri</i>	Fraser's St. John's-wort	Clusiaceae	S5	•	r									r			
<i>Hypericum majus</i>	Large St John's-wort	Clusiaceae	S4	•		r								r		r	
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	SNA		c	c				•		r	r				
<i>Viola cf. adunca</i>	Hooked Violet	Violaceae	S3			r											
<i>Viola blanda</i>	Sweet White Violet	Violaceae	S5			u					u	•		r			
<i>Viola cucullata</i>	Marsh Blue Violet	Violaceae	S5		r	•			f	•	f		f				
<i>Viola labradorica</i>	Labrador Violet	Violaceae	S4S5	•	c				l	u	r	f	c	f			•
<i>Viola macloskeyi</i>	Small White Violet	Violaceae	S5		r					•			•	u			
<i>Viola nephrophylla</i>	Northern Bog Violet	Violaceae	S3			f			r	r		r	•	r			
<i>Viola novae-angliae</i>	New England Violet	Violaceae	S2										u				
<i>Viola pubescens</i>	Downy Yellow Violet	Violaceae	S4S5				r										
<i>Viola renifolia</i>	Kidney-leaved White Violet	Violaceae	S4S5	•	u	c	fc			•	l	u	c	l	•	r	f
<i>Viola sororia</i>	Woolly Blue Violet	Violaceae	S5							c			r	r			
<i>Viola sp.</i>	a violet	Violaceae	-										•				
<i>Populus balsamifera</i>	Balsam Poplar	Salicaceae	S5	•	c	u	f	•	c	f	r	c	f	f	•	u	f
<i>Populus tremuloides</i>	Trembling Aspen	Salicaceae	S5	•	c	c	c	•	l	c	l		c	c	•	•	c
<i>Salix bebbiana</i>	Bebb's Willow	Salicaceae	S5	•	c	c	r	•	f	f	u	r	f	r	•	u	c
<i>Salix cf. lucida x eriocephala</i>	a willow	Salicaceae	-									r					
<i>Salix discolor</i>	Pussy Willow	Salicaceae	S5		c	f	r		r	•		r	u	u			c
<i>Salix eriocephala</i>	Cottony Willow	Salicaceae	S5	•	c	u	u	•	u	u		f	•	f	•	r	•
<i>Salix humilis</i>	Upland Willow	Salicaceae	S5		c	u		•	r	r	r		•	r			r
<i>Salix lucida</i>	Shining Willow	Salicaceae	S5		u	u		•	u	c	r		r	u			
<i>Salix cf. myricoides</i>	Bayberry Willow	Salicaceae	S2?							•							
<i>Salix pellita</i>	Satiny Willow	Salicaceae	S4S5							r		f		f			

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Salix petiolaris</i>	Meadow Willow	Salicaceae	S5		f												
<i>Salix pyrifolia</i>	Balsam Willow	Salicaceae	S5							•							
<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress	Brassicaceae	S3									r	•	r			
<i>Barbarea vulgaris</i>	Yellow Rocket	Brassicaceae	SNA			r		•		•							
<i>Cardamine diphylla</i>	Two-leaved Toothwort	Brassicaceae	S4S5		r	r	r	•				r	•			•	
<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	Brassicaceae	S5		f	r	u	•		•	r		r	u		u	r
<i>Draba arabisans</i>	Rock Whitlow-Grass	Brassicaceae	S1										r				
<i>Erysimum cheiranthoides</i>	Worm-seeded Wallflower	Brassicaceae	S5		r	r	r		r	r							
<i>Rorippa palustris</i>	Bog Yellowcress	Brassicaceae	S5									r					
<i>Chamaedaphne calyculata</i>	Leatherleaf	Ericaceae	S5													•	
<i>Epigaea repens</i>	Trailing Arbutus	Ericaceae	S5	•	u	f	r		r	•	r	•	f	u	•	•	
<i>Gaultheria hispidula</i>	Creeping Snowberry	Ericaceae	S5	•	f	u		•	u	l	u		f	c	•	•	•
<i>Gaultheria procumbens</i>	Eastern Teaberry	Ericaceae	S5	•	r	f			u	•			•	l			
<i>Kalmia angustifolia</i>	Sheep Laurel	Ericaceae	S5	•	u	u			u	•			f	c		•	l
<i>Rhododendron canadense</i>	Rhodora	Ericaceae	S5													•	
<i>Rhododendron groenlandicum</i>	Common Labrador Tea	Ericaceae	S5						r					f		•	l
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	Ericaceae	S5		c	c	c		c	•		c	c	c	•	c	c
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	Ericaceae	S5	•	r	c	r		u	fc	c	•	•	c	•	c	u
<i>Chimaphila umbellata</i>	Common Pipsissewa	Pyrolaceae	S5		r	c	c	•	c	•	f	c	•	f	•	r	u
<i>Moneses uniflora</i>	One-flowered Wintergreen	Pyrolaceae	S5		r	f	r	•					•		•		
<i>Orthilia secunda</i>	One-sided Wintergreen	Pyrolaceae	S5	•	f	c	c	•		r	f	c	c	c	•	c	c
<i>Pyrola americana</i>	Round-leaved Pyrola	Pyrolaceae	S4S5			•	r			•						•	
<i>Pyrola asarifolia</i>	Pink Pyrola	Pyrolaceae	S5	•	u	u	l	•	u	•	l	f	•	f	•	•	u
<i>Pyrola chlorantha</i>	Green-flowered Pyrola	Pyrolaceae	S4					•			r						

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Pyrola elliptica</i>	Shinleaf	Pyrolaceae	S5		r		u	•	f	•	u	c			•	•	u
<i>Pyrola minor</i>	Lesser Pyrola	Pyrolaceae	S3							•							
<i>Hypopitys monotropa</i>	Pinesap	Monotropaceae	S4				r										
<i>Monotropa uniflora</i>	Convulsion-Root	Monotropaceae	S5	•		r		•			r	r			•		
<i>Lysimachia borealis</i>	Northern Starflower	Primulaceae	S5	•	r	c	c	•		l	c	c	c	c	•	c	c
<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife	Primulaceae	S5									r					
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	Primulaceae	S5	•	u	r			c		r						
<i>Primula mistassinica</i>	Mistassini Primrose	Primulaceae	S3					•		•							
<i>Ribes americanum</i>	Wild Black Currant	Grossulariaceae	S4													r	
<i>Ribes glandulosum</i>	Skunk Currant	Grossulariaceae	S5		c	u	f		u	r		u		c	•	c	c
<i>Ribes hirtellum</i>	Smooth Gooseberry	Grossulariaceae	S5							r							
<i>Ribes lacustre</i>	Bristly Black Currant	Grossulariaceae	S5	•	c	c	c	•	c	f	c	c	c	c	•	c	c
<i>Ribes triste</i>	Swamp Red Currant	Grossulariaceae	S5	•	c	f	r	•	r	r	r	r		r		•	r
<i>Chrysosplenium americanum</i>	American Golden Saxifrage	Saxifragaceae	S5	•	r	r		•		r		•	r	r		•	•
<i>Mitella nuda</i>	Naked Bishop's-Cap	Saxifragaceae	S5	•	f	•	c	•		c	c	c	c	c	•	c	c
<i>Parnassia glauca</i>	Fen Grass-of-Parnassus	Saxifragaceae	S3			f											
<i>Agrimonia gryposepala</i>	Hooked Agrimony	Rosaceae	S4				r										
<i>Agrimonia striata</i>	Woodland Agrimony	Rosaceae	S5	•		•	c	•	u	•		f	u		•	l	f
<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	Rosaceae	S5	•	f	u	r	•	u	u	c	•	r	f		r	
<i>Amelanchier humilis</i>	Low Serviceberry	Rosaceae	SNA									r					
<i>Amelanchier sanguinea</i>	Round-leaved Serviceberry	Rosaceae	S4S5	•	r	r				u		•	•				
<i>Amelanchier sp.</i>	an amelanchier	Rosaceae	-			•			u	u		f		f			u
<i>Amelanchier spicata</i>	Running Serviceberry	Rosaceae	S5							f							
<i>Crataegus flabellata</i>	Fan-leaved Hawthorn	Rosaceae	S4S5									r					

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry	Rosaceae	S4	•	c	f	u		r	f		•	fc	r	•	•	
<i>Fragaria virginiana</i>	Wild Strawberry	Rosaceae	S5	•	c	f	c	•	c	c	c	c	c	c	•	c	
<i>Geum aleppicum</i>	Yellow Avens	Rosaceae	S5		f	c				•		u	c				f
<i>Geum laciniatum</i>	Rough Avens	Rosaceae	S5	•			u	•	f	f	r			r			
<i>Geum macrophyllum</i>	Large-Leaved Avens	Rosaceae	S5		u	c	c	•	c	•	u		•	r	•	c	
<i>Geum rivale</i>	Water Avens	Rosaceae	S5	•	f	u	u	•						r		r	f
<i>Geum sp.</i>	an avens	Rosaceae	-											•			
<i>Potentilla anserina ssp. anserina</i>	Common Silverweed	Rosaceae	S5				c										
<i>Potentilla argentea</i>	Silvery Cinquefoil	Rosaceae	SNA											r			r
<i>Potentilla norvegica</i>	Rough Cinquefoil	Rosaceae	S5	•	c	f	f	•	r	u	f	•	r	f	•	c	f
<i>Potentilla simplex</i>	Old Field Cinquefoil	Rosaceae	S5			r				r							
<i>Prunus pensylvanica</i>	Pin Cherry	Rosaceae	S5	•	c	c			c	r	r		f	u	•	c	•
<i>Prunus pumila var. depressa</i>	Sand Cherry	Rosaceae	S4			u											
<i>Prunus serotina</i>	Black Cherry	Rosaceae	S5				c		f					r			
<i>Prunus virginiana</i>	Chokecherry	Rosaceae	S5	•	c		l		c	c		f	u	c	•		
<i>Rosa blanda</i>	Smooth Rose	Rosaceae	S5			c				r		r	•				
<i>Rosa virginiana</i>	Virginia Rose	Rosaceae	S5						r								
<i>Rubus canadensis</i>	Smooth Blackberry	Rosaceae	S5											r			
<i>Rubus idaeus ssp. strigosus</i>	Red Raspberry	Rosaceae	S5	•	c	c	c	•	u	c	c	c	c	c	•	c	c
<i>Rubus pubescens</i>	Dwarf Red Raspberry	Rosaceae	S5	•		c	c	•	c	c	c	c	c	c	•	c	c
<i>Rubus repens</i>	Dewdrop	Rosaceae	S5										r				
<i>Sorbus americana</i>	American Mountain Ash	Rosaceae	S5	•	f	c	c	•	c	u	c	c	c	c	•	c	c
<i>Sorbus decora</i>	Showy Mountain Ash	Rosaceae	S4S5		r							r	f				
<i>Spiraea alba var. latifolia</i>	White Meadowsweet	Rosaceae	S5	•	f					c							r
<i>Amphicarpaea bracteata</i>	American Hog Peanut	Fabaceae	S4S5			•											

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Desmodium canadense</i>	Canada Tick-trefoil	Fabaceae	S4S5			r											
<i>Hedysarum americanum</i>	Alpine Hedysarum	Fabaceae	S3			c											
<i>Lathyrus latifolius</i>	Everlasting Pea	Fabaceae	SNA						r								
<i>Lathyrus palustris</i>	Marsh Vetchling	Fabaceae	S5			c											
<i>Medicago lupulina</i>	Black Medick	Fabaceae	SNA	•		r				•	r	r	r				
<i>Melilotus albus</i>	White Sweet-clover	Fabaceae	SNA	•		u	u	•	f	r	•	r					
<i>Trifolium aureum</i>	Yellow Clover	Fabaceae	SNA	•	r	u	l	•	c	r		u	l		l		
<i>Trifolium campestre</i>	Low Hop Clover	Fabaceae	SNA							•	r	r	r			r	
<i>Trifolium hybridum</i>	Alsike Clover	Fabaceae	SNA	•		u		•		u		u	r	r	•	r	•
<i>Trifolium medium</i>	Zigzag Clover	Fabaceae	SNA						u								
<i>Trifolium pratense</i>	Red Clover	Fabaceae	SNA	•		u	c	•	c	•	l	r	•	r	•		
<i>Trifolium repens</i>	White Clover	Fabaceae	SNA	•		r	c	•	c	•	l	•	u	u	•	c	
<i>Vicia cracca</i>	Tufted Vetch	Fabaceae	SNA	•	c	c	c	•	c	c	c	f	r	c	•	c	f
<i>Chamaenerion angustifolium</i>	Fireweed	Onagraceae	S5	•	f	f	r	•	c	u	f	f	f	f	•	c	c
<i>Circaea alpina</i>	Small Enchanter's Nightshade	Onagraceae	S5	•	c	c	c	•	l	l	c	f	c	c	•	l	c
<i>Epilobium ciliatum</i>	Northern Willowherb	Onagraceae	S5		c	c	c			f	f	c	f	c	•	f	c
<i>Oenothera biennis</i>	Common Evening Primrose	Onagraceae	S5		u	r	f	•	c	•		r	r	r		r	r
<i>Oenothera perennis</i>	Perennial Evening Primrose	Onagraceae	S5	•	f	u	r	•	r	f	r	•	r	u			
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	Cornaceae	S5	•	u	r	l	•		•	u				•	r	u
<i>Cornus canadensis</i>	Bunchberry	Cornaceae	S5	•	c	f	c	•	c	c	c	c	c	c	•	c	c
<i>Cornus rugosa</i>	Round-leaved Dogwood	Cornaceae	S4				l		l			r					
<i>Cornus sericea</i>	Red Osier Dogwood	Cornaceae	S5	•	c	f	c	•	c	c	c	c	c	c	•	c	c
<i>Ilex mucronata</i>	Mountain Holly	Aquifoliaceae	S5		r							u	u		•	r	
<i>Endotropis alnifolia</i>	alder-leaved buckthorn	Rhamnaceae	S4S5									r					

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<i>Acer pensylvanicum</i>	Striped Maple	Aceraceae	S5			c	c	•	r	•	l	c	c	c	•	c	c
<i>Acer rubrum</i>	Red Maple	Aceraceae	S5	•	c	c		•	c	c	c	c	c	c	•	c	c
<i>Acer saccharum</i>	Sugar Maple	Aceraceae	S5	•		c	c	•	r	•	l	c	c	c	•	c	f
<i>Acer spicatum</i>	Mountain Maple	Aceraceae	S5	•	c	c	c	•	c	•	c	c	c	c	•	c	c
<i>Rhus typhina</i>	Staghorn Sumac	Anacardiaceae	S5													•	
<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	Western Poison Ivy	Anacardiaceae	S5									r	•				
<i>Oxalis montana</i>	Common Wood Sorrel	Oxalidaceae	S5	•	f	f	c	•		•	u	c	c	f	•	r	c
<i>Oxalis stricta</i>	European Wood Sorrel	Oxalidaceae	S5	•	f	u	l	•		r	r	r	c	f	•		r
<i>Impatiens capensis</i>	Spotted Jewelweed	Balsaminaceae	S5	•	f	c	c	•	l	•	f	f	c	c	•	l	f
<i>Aralia hispida</i>	Bristly Sarsaparilla	Araliaceae	S5			r											r
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	Araliaceae	S5	•	c	c	c	•		c	c	c	c	c	•	c	c
<i>Aralia racemosa</i>	American Spikenard	Araliaceae	S4S5			u	r					r	u			r	
<i>Aegopodium podagraria</i>	Bishop's Goutweed	Apiaceae	SNA						r								
<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	Apiaceae	S4S5	•	f					c			r				
<i>Cicuta bulbifera</i>	Bulbous Water-hemlock	Apiaceae	S5							r				u		r	
<i>Cicuta maculata</i>	Spotted Water-Hemlock	Apiaceae	S5								r						
<i>Conioselinum chinense</i>	Chinese Hemlock-parsley	Apiaceae	S4	•	f		r	•		c		u	c	f		r	f
<i>Daucus carota</i>	Queen Anne's Lace	Apiaceae	SNA							•							
<i>Heracleum maximum</i>	Common Cow Parsnip	Apiaceae	S5	•	f	r	c	•	c	c	u	u	f	f	•		f
<i>Hydrocotyle americana</i>	American Marsh Pennywort	Apiaceae	S5	•										r			
<i>Osmorhiza berteroi</i>	Mountain Sweet Cicely	Apiaceae	S4			r											
<i>Osmorhiza</i> sp.	a sweet cicely	Apiaceae	-														r
<i>Pimpinella saxifraga</i>	Burnet Saxifrage	Apiaceae	SNA											r			
<i>Sanicula marilandica</i>	Maryland Sanicle	Apiaceae	S4S5		r	u				f		r	r	u			r

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<i>Sium suave</i>	Common Water Parsnip	Apiaceae	S5	•													
<i>Zizia aurea</i>	Golden Alexanders	Apiaceae	S4									r					
<i>Gentiana rubricaulis</i>	Purple-stemmed Gentian	Gentianaceae	S1							r							
<i>Gentianella amarella ssp. acuta</i>	Northern Gentian	Gentianaceae	S3													•	
<i>Halenia deflexa</i>	Spurred Gentian	Gentianaceae	S4S5	•		u		•	r	c	l	f	l	r		u	r
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	Apocynaceae	S5	•	r	r		•	l	•			•	r	•	•	
<i>Apocynum cannabinum</i>	Hemp Dogbane	Apocynaceae	S4			u							•				
<i>Apocynum x floribundum</i>	a hybrid Dogbane	Apocynaceae	SNA			r											
<i>Solanum dulcamara</i>	Bittersweet Nightshade	Solanaceae	SNA							•		r					
<i>Echium vulgare</i>	Common Viper's Bugloss	Boraginaceae	SNA						u								
<i>Myosotis laxa</i>	Small Forget-Me-Not	Boraginaceae	S5		u		c		u		fc	r		c		c	f
<i>Verbena hastata</i>	Blue Vervain	Verbenaceae	S4												•		
<i>Clinopodium vulgare</i>	Wild Basil	Lamiaceae	S4S5	•			c	•				r	c				
<i>Galeopsis bifida</i>	Bifid Hemp-nettle	Lamiaceae	SNA			u		•		•		c	u	u	•		f
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	Lamiaceae	SNA		r		u			r	r	r	r	r		u	
<i>Lycopus americanus</i>	American Water Horehound	Lamiaceae	S5	•		r	f	•		•	r	•	•	r			
<i>Lycopus uniflorus</i>	Northern Water Horehound	Lamiaceae	S5		f	f	f			f	l	c	c	c	•	c	
<i>Mentha canadensis</i>	Canadian Mint	Lamiaceae	S5	•	f	r	c	•	f	c		c	c	c	•	c	c
<i>Mentha spicata</i>	Spearmint	Lamiaceae	SNA					•									
<i>Prunella vulgaris</i>	Common Self-heal	Lamiaceae	S5	•	f	c	c	•	c	c	c	c	c	c	•	c	f
<i>Scutellaria galeericulata var. pubescens</i>	Marsh Skullcap	Lamiaceae	S5	•	f		f		f	c			u			r	
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	Lamiaceae	S5	•	r	•	c	•	u	c	r	f	c	c	•	c	c
<i>Scutellaria x churchilliana</i>	Mad Dog Skullcap	Lamiaceae	SNA										r				
<i>Stachys pilosa</i>	Hairy Hedge-Nettle	Lamiaceae	S3S4				r		r								

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<i>Callitriche palustris</i>	Marsh Water-starwort	Callitrichaceae	S5		r				r	•		u					
<i>Callitriche palustris / heterophylla</i>	a water-starwort	Callitrichaceae	-										r				
<i>Plantago major</i>	Common Plantain	Plantaginaceae	SNA	•	u	•	c	•	c	•	r	u	r	l	•	l	r
<i>Plantago rugelii</i>	Rugel's Plantain	Plantaginaceae	S4				r			•		•				r	
<i>Fraxinus nigra</i>	Black Ash	Oleaceae	S4S5	•	c		f	•	c	•	r	c	r	c	•	r	
<i>Chelone glabra</i>	White Turtlehead	Scrophulariaceae	S5	•	r		f		u	•	u	u	r	f	•	r	u
<i>Euphrasia nemorosa</i>	Common Eyebright	Scrophulariaceae	SNA										r	r	•		r
<i>Euphrasia sp.</i>	an eyebright	Scrophulariaceae	-			•	u			•	l		u	l		l	
<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop	Scrophulariaceae	S4	•		f	r		r	•		r		r		r	
<i>Linaria vulgaris</i>	Butter-and-Eggs	Scrophulariaceae	SNA						r								
<i>Lindernia dubia</i>	Yellow-seeded False Pimperel	Scrophulariaceae	S4									r		r	•		
<i>Melampyrum lineare</i>	American Cow Wheat	Scrophulariaceae	S5		u	u			u	•						•	r
<i>Mimulus ringens</i>	Square-stemmed Monkeyflower	Scrophulariaceae	S5							•		r	•	r			
<i>Rhinanthus minor</i>	Little Yellow Rattle	Scrophulariaceae	SNA			f		•									
<i>Verbascum thapsus</i>	Common Mullein	Scrophulariaceae	SNA						c				•				
<i>Veronica americana</i>	American Speedwell	Scrophulariaceae	S5		u	u	r	•	r	f		•	•	r	•	•	
<i>Veronica officinalis</i>	Common Speedwell	Scrophulariaceae	SNA	•		r	l	•	c	r	l	f	r	f	•	•	
<i>Veronica peregrina ssp. peregrina</i>	Purslane Speedwell	Scrophulariaceae	SNA				r										
<i>Veronica scutellata</i>	Marsh Speedwell	Scrophulariaceae	S5							r	r		•	r		r	
<i>Veronica serpyllifolia</i>	Thyme-Leaved Speedwell	Scrophulariaceae	SNA			r	r		r	•			r	r			
<i>Pinguicula vulgaris ssp. vulgaris</i>	Common Butterwort	Lentibulariaceae	S1					•									
<i>Campanula intercedens</i>	Intermediate Bellflower	Campanulaceae	S5	•	f	u		•	c	•	l	l	c	c	•	c	•
<i>Lobelia inflata</i>	Inflated Lobelia	Campanulaceae	S5				r										
<i>Lobelia kalmii</i>	Brook Lobelia	Campanulaceae	S3S4			c				•							

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Galium asprellum</i>	Rough Bedstraw	Rubiaceae	S5	•	c	f	c	•	c	•	c	f	c	c	•	c	f
<i>Galium boreale</i>	Northern Bedstraw	Rubiaceae	S3						r	•							
<i>Galium mollugo</i>	Smooth Bedstraw	Rubiaceae	SNA			c			c	•		r					
<i>Galium palustre</i>	Common Marsh Bedstraw	Rubiaceae	S5	•	c	f	c		u	c		c	c	c			c
<i>Galium tinctorium</i>	Dyer's Bedstraw	Rubiaceae	S5							•		r	r	r			
<i>Galium trifidum</i>	Three-petaled Bedstraw	Rubiaceae	S5							•							
<i>Galium triflorum</i>	Three-flowered Bedstraw	Rubiaceae	S5	•	c	f	c	•	c	c	c	•	c	c	•	l	
<i>Mitchella repens</i>	Partridgeberry	Rubiaceae	S5									r		r			
<i>Diervilla lonicera</i>	Northern Bush Honeysuckle	Caprifoliaceae	S5	•	c	c	c	•	c	c	c	c	f	fc	•	c	c
<i>Linnaea borealis ssp. longiflora</i>	Twinflower	Caprifoliaceae	S5	•			c	•	c	c	c	•	c		•	c	
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	Caprifoliaceae	S5	•	u	f	f	•	f	f	c	f	c	c		f	c
<i>Lonicera villosa</i>	Mountain Fly Honeysuckle	Caprifoliaceae	S5											u			
<i>Sambucus canadensis</i>	Common Elderberry	Caprifoliaceae	S5				r					f	c			fc	c
<i>Sambucus racemosa</i>	Red Elderberry	Caprifoliaceae	S5	•				•		•		•	•	u	•	•	r
<i>Viburnum edule</i>	Squashberry	Caprifoliaceae	S4?		f			•	r	u	f	•		r		u	u
<i>Viburnum lantanoides</i>	Hobblebush	Caprifoliaceae	S5									r					
<i>Viburnum nudum var. cassinoides</i>	Northern Wild Raisin	Caprifoliaceae	S5		u					•			u			•	
<i>Viburnum opulus</i>	Highbush Cranberry	Caprifoliaceae	S4	•				•		•				r			
<i>Valeriana officinalis</i>	Common Valerian	Valerianaceae	SNA			r											
<i>Achillea borealis</i>	Northern Yarrow	Asteraceae	S5	•	f	r	c	•	c	c	c	r	c	c	•	c	f
<i>Achillea ptarmica</i>	Sneezeweed	Asteraceae	SNA			r							r		•		
<i>Ageratina altissima</i>	White Snakeroot	Asteraceae	S4S5	•		c	r	•	r	•		u	c	u	•	r	u
<i>Anaphalis margaritacea</i>	Pearly Everlasting	Asteraceae	S5	•	c	f	c	•	c	c	c	f	c	c	•	c	f
<i>Antennaria howellii</i>	Howell's Pussytoes	Asteraceae	S5						r	l	r	r	r	u			r

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Antennaria sp.</i>	a pussytoes	Asteraceae	-		f						•						
<i>Arctium minus</i>	Common Burdock	Asteraceae	SNA			r	r									r	
<i>Arnica lanceolata</i>	Lance-leaved Arnica	Asteraceae	S3									r				r	
<i>Arnica lonchophylla</i>	Northern Arnica	Asteraceae	S1							•		r					
<i>Artemisia vulgaris</i>	Common Wormwood	Asteraceae	SNA						r					•			
<i>Bidens cernua</i>	Nodding Beggarticks	Asteraceae	S5										r				
<i>Bidens frondosa</i>	Devil's Beggarticks	Asteraceae	S5								r		r				
<i>Canadanthus modestus</i>	Great Northern Aster	Asteraceae	S1							•							
<i>Centaurea nigra</i>	Black Knapweed	Asteraceae	SNA			f	l	•	c	•	l	f	c	c	•	c	r
<i>Cirsium arvense</i>	Canada Thistle	Asteraceae	SNA		u	u	u	•	r	•		r	r				r
<i>Cirsium muticum</i>	Swamp Thistle	Asteraceae	S5	•	c	f		•		c	f	r	f	u	•	u	r
<i>Cirsium vulgare</i>	Bull Thistle	Asteraceae	SNA		u	f	f		r	f				r	•	r	r
<i>Crepis tectorum</i>	Narrow-leaved Hawksbeard	Asteraceae	SNA	•	u	r				•							
<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	Asteraceae	S5	•	c	c	f		c	c	c	c	c	c		c	c
<i>Erechtites hieraciifolius</i>	Eastern Burnweed	Asteraceae	S5													r	
<i>Erigeron annuus</i>	Annual Fleabane	Asteraceae	S4S5			f			u					r			
<i>Erigeron canadensis</i>	Canada Horseweed	Asteraceae	S5		f	f	u	•	r	r		r	•		•		
<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	Asteraceae	S3			c		•	•		r	f	c	r			
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	Asteraceae	S4	•		u	c	•		l		u	c				u
<i>Erigeron strigosus</i>	Rough Fleabane	Asteraceae	S5	•	u	f	l	•	c	•		u	r	r		•	r
<i>Erigeron strigosus / annuus</i>	a fleabane	Asteraceae	-							c							
<i>Eupatorium perfoliatum</i>	Common Boneset	Asteraceae	S5												•		
<i>Eurybia macrophylla</i>	Large-leaved Aster	Asteraceae	S5	•	c	c	l	•	c	c	r	r	•			u	
<i>Eurybia radula</i>	Low Rough Aster	Asteraceae	S5							c							

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.	
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	Asteraceae	S5	•	c	c	c	•	c	c	l	f	c	c	•	c	c	
<i>Eutrochium maculatum</i>	Spotted Joe Pye Weed	Asteraceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c	
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	Asteraceae	SNA			f	r					r	u	c	•	l		
<i>Hieracium / Pilosella sp.</i>	a hawkweed	Asteraceae	-		c													
<i>Hieracium lachenalii ssp. cruentifolium</i>	Common Hawkweed	Asteraceae	SNA	•	u				u	r					•			
<i>Hieracium scabrum</i>	Rough Hawkweed	Asteraceae	S5										r					
<i>Hieracium umbellatum</i>	Umbellate Hawkweed	Asteraceae	SNR	•	r	r			u	•		r	c	f		•		
<i>Lactuca biennis</i>	Tall Blue Lettuce	Asteraceae	S5	•	f	f		•	r	•	r					•	u	
<i>Lactuca canadensis</i>	Canada Lettuce	Asteraceae	S5		f	r				•								
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Asteraceae	SNA	•	r	f	c	•	c	c	l	r	r	r	•	f	r	
<i>Matricaria discoidea</i>	Pineapple Weed	Asteraceae	SNA			•		•	r	•			u	u				
<i>Nabalus altissimus</i>	Tall Rattlesnakeroot	Asteraceae	S5	•	c		c	•	fc	•	f	c	f	f		u	c	
<i>Nabalus trifoliolatus</i>	Three-leaved Rattlesnakeroot	Asteraceae	S5	•	•		f	•	f	fc	c	c	c	f	•	c	c	
<i>Oclemena acuminata</i>	Whorled Wood Aster	Asteraceae	S5	•		f	u	•	u			u		u	•	r		
<i>Omalothea sylvatica</i>	Woodland Cudweed	Asteraceae	S4S5		r	u						r		f	•	l	r	
<i>Packera aurea</i>	Golden Groundsel	Asteraceae	S4S5	•	f	r	l	•		c	c	f		r		c		
<i>Packera schweinitziana</i>	Schweinitz's Groundsel	Asteraceae	S4							c				r				
<i>Petasites frigidus var. palmatus</i>	Northern Sweet Coltsfoot	Asteraceae	S4S5							•								
<i>Pilosella aurantiaca</i>	Orange Hawkweed	Asteraceae	SNA		r	r			u	•								
<i>Pilosella caespitosa</i>	Meadow Hawkweed	Asteraceae	SNA		c	f	c		c	u		c		c		f	c	
<i>Pilosella caespitosa / aurantiaca</i>	a hawkweed	Asteraceae	-							•								
<i>Pilosella flagellaris</i>	Whiplash Hawkweed	Asteraceae	SNA			u	u		c	•				l				
<i>Pilosella officinarum</i>	Mouse-ear Hawkweed	Asteraceae	SNA	•	u	r	r	•		•	l		u	l	•	c		
<i>Pilosella piloselloides</i>	Tall Hawkweed	Asteraceae	SNA						c	c		f	r				u	

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Pilosella x floribunda</i>	king devil hawkweed	Asteraceae	SNA										fc	c		c	
<i>Rudbeckia hirta</i> var. <i>pulcherrima</i>	Black-Eyed Susan	Asteraceae	SNA						r								
<i>Scorzoneroideis autumnalis</i>	Autumn Hawkbit	Asteraceae	SNA								r			l			r
<i>Senecio viscosus</i>	Sticky Ragwort	Asteraceae	SNA					r									
<i>Solidago altissima</i>	Tall Goldenrod	Asteraceae	S2S3			f											
<i>Solidago canadensis</i>	Canada Goldenrod	Asteraceae	S5	•	c	c	c	•		c	c	f	c	c		c	f
<i>Solidago cf. brendiae</i>	Brenda's Goldenrod	Asteraceae	SU									u					
<i>Solidago cf. macrophylla x rugosa</i>	a hybrid goldenrod	Asteraceae	-														r
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	Asteraceae	S5	•	c	f	u	•	u	f	c	c	c	c	•	c	f
<i>Solidago gigantea</i>	Giant Goldenrod	Asteraceae	S5			f											
<i>Solidago hispida</i>	Hairy Goldenrod	Asteraceae	S4	•	c	c	r			•		r	c	c		•	•
<i>Solidago macrophylla</i>	Large-leaved Goldenrod	Asteraceae	S4	•	u	f	r		r	u	c	r	f	u		c	f
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	Asteraceae	S5	•	c		u		f	c	f	u	f	c		r	c
<i>Solidago squarrosa</i>	Stout Goldenrod	Asteraceae	S4		r	u	r		c				r	r	•	•	
<i>Sonchus arvensis</i>	Field Sow Thistle	Asteraceae	SNA					r		•							
<i>Sonchus asper</i>	Prickly Sow Thistle	Asteraceae	SNA		r												
<i>Symphotrichum anticostense</i>	Anticosti Aster	Asteraceae	S2S3			•											
<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster	Asteraceae	S5	•	f	u	u	•	u	r	r					•	r
<i>Symphotrichum cordifolium</i>	Heart-leaved Aster	Asteraceae	S5			r	c	•		•		c	u			•	r
<i>Symphotrichum lanceolatum</i>	Lance-leaved Aster	Asteraceae	S5								r						
<i>Symphotrichum novi-belgii</i>	New York Aster	Asteraceae	S5									c	r				
<i>Symphotrichum novi-belgii</i> var. <i>novi-belgii</i>	New Belgium American-Aster	Asteraceae	S5			•				•							
<i>Symphotrichum novi-belgii</i> var. <i>villicaule</i>	a New Belgium American-Aster	Asteraceae	SNR	•		f		•		u		•					
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	Asteraceae	S5	•	c	c	f	•	c	c	c	c	c	c	•	c	c

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				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Tanacetum bipinnatum</i> ssp. <i>huronense</i>	Lake Huron Tansy	Asteraceae	S3			r											
<i>Tanacetum vulgare</i>	Common Tansy	Asteraceae	SNA						r								
<i>Taraxacum officinale</i>	Common Dandelion	Asteraceae	SNA	•	f	f	c	•	c	c	c	f	c	c			
<i>Taraxacum</i> sp.	a dandelion	Asteraceae	-							•							
<i>Tussilago farfara</i>	Coltsfoot	Asteraceae	SNA	•	f	c	c	•	c	c	c	f	c	c	•	c	c
<i>Alisma triviale</i>	Northern Water Plantain	Alismataceae	S5											u		r	
<i>Potamogeton alpinus</i>	Alpine Pondweed	Potamogetonaceae	S5									r		r			
<i>Potamogeton amplifolius</i>	Large-leaved Pondweed	Potamogetonaceae	S4									r					
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	Araceae	S5	•		u	r	•	u	•		u	r	r			
<i>Juncus alpinoarticulatus</i>	A Rush	Juncaceae	S4							•		u					
<i>Juncus alpinoarticulatus</i> ssp. <i>americanus</i>	Northern Green Rush	Juncaceae	S4							r	r		r				
<i>Juncus articulatus</i>	Jointed Rush	Juncaceae	S5	•			r		u	•	r	•		u			
<i>Juncus brachycephalus</i>	Small-Head Rush	Juncaceae	S2S3							•							
<i>Juncus brevicaudatus</i>	Narrow-Panicled Rush	Juncaceae	S5		u	r				r		u		r	•		
<i>Juncus bufonius</i>	Toad Rush	Juncaceae	S5			u								r			
<i>Juncus canadensis</i>	Canada Rush	Juncaceae	S5														r
<i>Juncus dudleyi</i>	Dudley's Rush	Juncaceae	S4		r					•		r					
<i>Juncus effusus</i>	Soft Rush	Juncaceae	S5		u	r	u	•	r	f			•	u	•	f	r
<i>Juncus filiformis</i>	Thread Rush	Juncaceae	S5		r				r	•							
<i>Juncus nodosus</i>	Knotted Rush	Juncaceae	S4S5	•	r	r	u			c		•	•				
<i>Juncus tenuis</i>	Slender Rush	Juncaceae	S5		c	f	l	•	c	•	r	r	u	l	•	l	r
<i>Luzula acuminata</i>	Hairy Woodrush	Juncaceae	S5	•			r			•							
<i>Luzula multiflora</i>	Common Woodrush	Juncaceae	S5	•	r	r			f	u	r	•	•	r			
<i>Luzula parviflora</i>	Small-flowered Woodrush	Juncaceae	S4				r				r	•	r	r			r

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<i>Carex albicans var. emmonsii</i>	White-tinged Sedge	Cyperaceae	S2										•				
<i>Carex aquatilis</i>	Water Sedge	Cyperaceae	S4S5						r	•		•					
<i>Carex arctata</i>	Black Sedge	Cyperaceae	S5	•	c	f	c		f	•	f	f	u	f	•	f	u
<i>Carex atratiformis</i>	Scabrous Black Sedge	Cyperaceae	S3	•	u	•	r		r	c	r	l	r	u			r
<i>Carex aurea</i>	Golden Sedge	Cyperaceae	S4			r				c		u	•				
<i>Carex aurea / garberi</i>	a sedge	Cyperaceae	-							•							
<i>Carex bebbii</i>	Bebb's Sedge	Cyperaceae	S4							•							
<i>Carex brunnescens</i>	Brownish Sedge	Cyperaceae	S5										u	r	•		r
<i>Carex buxbaumii</i>	Buxbaum's Sedge	Cyperaceae	S4										r				
<i>Carex canescens</i>	Silvery Sedge	Cyperaceae	S5		f												
<i>Carex capillaris</i>	Hairlike Sedge	Cyperaceae	S3			r			r	c	r	f	u				
<i>Carex castanea</i>	Chestnut Sedge	Cyperaceae	S4				r			c		r	r				
<i>Carex communis</i>	Fibrous-Root Sedge	Cyperaceae	S5		f	u	c		u	f	f		u	u			
<i>Carex concinna</i>	Beautiful Sedge	Cyperaceae	S2				r			u							
<i>Carex crawfordii</i>	Crawford's Sedge	Cyperaceae	S5		f	c	r		u	r				r		r	
<i>Carex crinita</i>	Fringed Sedge	Cyperaceae	S5									c	u				
<i>Carex cumulata</i>	Dense Sedge	Cyperaceae	S4S5											r			
<i>Carex deflexa</i>	Northern Sedge	Cyperaceae	S5		r		r							u		l	u
<i>Carex deweyana</i>	Dewey's Sedge	Cyperaceae	S5	•	f	c	c	•	r	r		r	•	•	•	•	•
<i>Carex disperma</i>	Two-seeded Sedge	Cyperaceae	S5					•		•	r						
<i>Carex eburnea</i>	Bristle-leaved Sedge	Cyperaceae	S3				r	•		•		•	f				r
<i>Carex echinata</i>	Star Sedge	Cyperaceae	S5		c		r			u				r			
<i>Carex flava</i>	Yellow Sedge	Cyperaceae	S5	•	c	u	f		f	c	r	c	f				
<i>Carex foenea</i>	Fernald's Hay Sedge	Cyperaceae	S4S5		r	r	r		r					r			
<i>Carex garberi</i>	Garber's Sedge	Cyperaceae	S3						r	•							

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<i>Carex gracillima</i>	Graceful Sedge	Cyperaceae	S5	•	c	f	c		u	c	f	•	r	u		f	r
<i>Carex gynandra</i>	Nodding Sedge	Cyperaceae	S5	•	c	f	c		c	c		c	•	c	•	c	•
<i>Carex haydenii</i>	Hayden's Sedge	Cyperaceae	S3		r												
<i>Carex houghtoniana</i>	Houghton's Sedge	Cyperaceae	S4														r
<i>Carex hystericina</i>	Porcupine Sedge	Cyperaceae	S4		u												
<i>Carex interior</i>	Inland Sedge	Cyperaceae	S5				r			u		r				•	
<i>Carex intumescens</i>	Bladder Sedge	Cyperaceae	S5		r		r		r	u		c	•	u	•	u	
<i>Carex lenticularis</i>	Lenticular Sedge	Cyperaceae	S5		c				r	r				r			
<i>Carex leptalea</i>	Bristly-stalked Sedge	Cyperaceae	S5	•	c			•	u	•		r		f	•	r	•
<i>Carex leptonevia</i>	Finely-Nerved Sedge	Cyperaceae	S5		f	u	f			r	u	r	u	f		c	r
<i>Carex lucorum</i>	Forest Sedge	Cyperaceae	S4							•	r			r			
<i>Carex magellanica ssp. irrigua</i>	Boreal Bog Sedge	Cyperaceae	S5													•	
<i>Carex media</i>	Intermediate Sedge	Cyperaceae	S1							r							
<i>Carex novae-angliae</i>	New England Sedge	Cyperaceae	S5								f		•		•		
<i>Carex ormostachya</i>	Necklace Spike Sedge	Cyperaceae	S3													r	
<i>Carex pallescens</i>	Pale Sedge	Cyperaceae	S5	•			r						r				
<i>Carex pauciflora</i>	Few-Flowered Sedge	Cyperaceae	S4S5													•	
<i>Carex peckii</i>	White-Tinged Sedge	Cyperaceae	S4							•							
<i>Carex pedunculata</i>	Long-stalked Sedge	Cyperaceae	S5	•	c	f	r	•	r	c	l	u	c	l	•		
<i>Carex projecta</i>	Necklace Sedge	Cyperaceae	S5	•	r	f	c	•	u	r		c	r	c	•	r	f
<i>Carex radiata</i>	Eastern Star Sedge	Cyperaceae	S4	•													
<i>Carex retrorsa</i>	Retorse Sedge	Cyperaceae	S4	•	f	r	f	•	r	r	r	u	•	r			•
<i>Carex scabrata</i>	Rough Sedge	Cyperaceae	S5	•	c	c			l	r	r	f	•	r	•	c	f
<i>Carex scoparia</i>	Broom Sedge	Cyperaceae	S5			r	r	•		•	r		r	u	•	f	f
<i>Carex stipata</i>	Awl-fruited Sedge	Cyperaceae	S5	•	c	u	c	•	f	c		u	•	f	•	r	

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE														
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.	
<i>Carex tincta</i>	Tinged Sedge	Cyperaceae	S4S5			r											r	
<i>Carex tonsa</i>	Deep Green Sedge	Cyperaceae	S5		r					•							r	
<i>Carex torta</i>	Twisted Sedge	Cyperaceae	S5	•		r	f		c	•	c	c	c	c			c	
<i>Carex tribuloides</i>	Blunt Broom Sedge	Cyperaceae	S4S5		r	r				u								
<i>Carex trisperma</i>	Three-seeded Sedge	Cyperaceae	S5								r	r	r	c			•	
<i>Carex tuckermanii</i>	Tuckerman's Sedge	Cyperaceae	S3									r						
<i>Carex umbellata / tonsa / concinna</i>	a sedge	Cyperaceae	-				r											
<i>Carex utriculata</i>	Northern Beaked Sedge	Cyperaceae	S5		r													
<i>Carex vesicaria</i>	Inflated Sedge	Cyperaceae	S5							•								
<i>Carex vesicaria / rostrata</i>	a sedge	Cyperaceae	-		r					•								
<i>Carex vulpinoidea</i>	Fox Sedge	Cyperaceae	S4S5					•		•								
<i>Eleocharis acicularis</i>	Needle Spikerush	Cyperaceae	S5			f					r			u				
<i>Eleocharis elliptica</i>	Elliptic Spikerush	Cyperaceae	S4			f			r									
<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush	Cyperaceae	S4									r						
<i>Eleocharis intermedia</i>	Matted Spikerush	Cyperaceae	S3				r		r	r		r						
<i>Eleocharis obtusa</i>	Blunt Spikerush	Cyperaceae	S5			r			r				r	•				
<i>Eleocharis ovata</i>	Ovate Spikerush	Cyperaceae	S5							r		r	r					
<i>Eleocharis palustris</i>	Common Spikerush	Cyperaceae	S5							•								
<i>Eriophorum angustifolium</i>	Narrow-leaved Cottongrass	Cyperaceae	S5														•	
<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	Cyperaceae	S5		f	u	u		u	•			l	f			u	u
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	Cyperaceae	S5	•		u				•	r			r	•			
<i>Scirpus hattorianus</i>	Mosquito Bulrush	Cyperaceae	S5	•	r	f	r	•	r			l		u	l	•	l	u
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	Cyperaceae	S5	•	c	r	r	•	r	u			•	f				
<i>Scirpus pedicellatus</i>	Stalked Bulrush	Cyperaceae	S4									r						

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Scirpus poss. atrovirens</i>	a bulrush	Cyperaceae	-			r											
<i>Trichophorum alpinum</i>	Alpine Clubrush	Cyperaceae	S4						r								
<i>Trichophorum cespitosum</i>	Tufted Clubrush	Cyperaceae	S4													•	
<i>Trichophorum clintonii</i>	Clinton's Clubrush	Cyperaceae	S3						r			r					
<i>Agrostis capillaris</i>	Colonial Bent Grass	Poaceae	SNA		u	u		•	c	•	l		u	l	•	u	
<i>Agrostis gigantea</i>	Redtop	Poaceae	SNA			r	u	•		•		r	r	r		u	r
<i>Agrostis mertensii</i>	Northern Bent Grass	Poaceae	S2								u		f	f			•
<i>Agrostis perennans</i>	Upland Bent Grass	Poaceae	S5		r					u		f					f
<i>Agrostis scabra</i>	Rough Bent Grass	Poaceae	S5		f	c	u		u	c	c	c	f	c	•	c	c
<i>Agrostis stolonifera</i>	Creeping Bent Grass	Poaceae	S5		f	f	f			•	r			u			
<i>Alopecurus aequalis</i>	Short-awned Foxtail	Poaceae	S4S5		r	u			r	u				r	•		
<i>Alopecurus pratensis</i>	Meadow Foxtail	Poaceae	SNA												•		
<i>Anthoxanthum hirtum</i>	Hairy Sweetgrass	Poaceae	SU			f											
<i>Avenella flexuosa</i>	Wavy Hairgrass	Poaceae	S5						r				r				
<i>Brachyelytrum aristosum</i>	Northern Shorthusk	Poaceae	S5				u	•		f	f	c	c	c			u
<i>Bromus ciliatus</i>	Fringed Brome	Poaceae	S5	•	c	c	c	•	c	c	f	c	c	c	•	c	f
<i>Bromus inermis</i>	Smooth Brome	Poaceae	SNA						u	•		r					
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	Poaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Cinna latifolia</i>	Drooping Wood Reed Grass	Poaceae	S5		f	c	fc	•	r	•	c	f	c	c		c	c
<i>Dactylis glomerata</i>	Orchard Grass	Poaceae	SNA										r				
<i>Danthonia spicata</i>	Poverty Oat Grass	Poaceae	S5		c	c	c		c	c	c	c	u	c	•	c	r
<i>Deschampsia cespitosa</i>	Tufted Hair Grass	Poaceae	S5			f				l			u	•			
<i>Dichanthelium acuminatum</i>	Woolly Panic Grass	Poaceae	SNA				r		r					r			
<i>Dichanthelium boreale</i>	Northern Panic Grass	Poaceae	S5			r											
<i>Digitaria ischaemum</i>	Smooth Crab Grass	Poaceae	SNA										r				

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Echinochloa crus-galli</i>	Large Barnyard Grass	Poaceae	SNA											r			
<i>Elymus repens</i>	Quack Grass	Poaceae	SNA			r	r		c			r	r	r			
<i>Elymus trachycaulus</i>	Slender Wild Rye	Poaceae	S4S5		r	r			f	c		r	r				
<i>Elymus wiegandii</i>	Wiegand's Wild Rye	Poaceae	S4						r	•							
<i>Festuca rubra</i>	Red Fescue	Poaceae	S5										r				
<i>Glyceria borealis</i>	Northern Manna Grass	Poaceae	S5						u			r					
<i>Glyceria canadensis</i>	Canada Manna Grass	Poaceae	S5											r			
<i>Glyceria grandis</i>	Common Tall Manna Grass	Poaceae	S5		r	r			r	f		r		r	•		
<i>Glyceria melicaria</i>	Slender Manna Grass	Poaceae	S5			u											
<i>Glyceria striata</i>	Fowl Manna Grass	Poaceae	S5	•	c		c	•	c	c	c	c	c	c	•	c	c
<i>Graphephorum melicoides</i>	Purple False Oats	Poaceae	S4			r			r	c		u	r				•
<i>Leersia oryzoides</i>	Rice Cut Grass	Poaceae	S5									r		r		r	
<i>Milium effusum var. cisatlanticum</i>	Tall Millet Grass	Poaceae	S4					•							•		
<i>Muhlenbergia glomerata</i>	Spiked Muhly	Poaceae	S4						u	l		r	c	l			
<i>Muhlenbergia mexicana</i>	Mexican Muhly	Poaceae	S5							u							
<i>Muhlenbergia sp.</i>	a muhly	Poaceae	-		r							•					
<i>Oryzopsis asperifolia</i>	White-grained Mountain Rice	Poaceae	S5	•		u	c	•	l	u			r			•	
<i>Panicum capillare</i>	Common Witch Grass	Poaceae	S5													r	
<i>Phalaris arundinacea</i>	Reed Canary Grass	Poaceae	S5	•	f	f	c		l	•	r	f	•	u			
<i>Phleum pratense</i>	Common Timothy	Poaceae	SNA			u	r	•	c	•	r	r	l	l	•	r	u
<i>Poa alsodes</i>	Grove Blue Grass	Poaceae	S4					•						r			
<i>Poa annua</i>	Annual Blue Grass	Poaceae	SNA			f	l		c	•			r	l		l	
<i>Poa compressa</i>	Canada Blue Grass	Poaceae	SNA			r	u	•	l	c		r	u	r	•	f	
<i>Poa glauca</i>	Glaucous Blue Grass	Poaceae	S2										r		•		
<i>Poa interior</i>	Inland Bluegrass	Poaceae	S1?										r				

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Poa palustris</i>	Fowl Blue Grass	Poaceae	S5	•	c		c	•	f	c	fc	f	c	c	•	c	c
<i>Poa pratensis</i>	Kentucky Blue Grass	Poaceae	S5						fc	u							•
<i>Poa saltuensis</i>	Weak Blue Grass	Poaceae	S4S5		u					•							
<i>Poa trivialis</i>	Rough Blue Grass	Poaceae	SNA			r											
<i>Schizachne purpurascens</i>	Purple Oat Grass	Poaceae	S4S5	•	f		f			fc	f	r	f				
<i>Sphenopholis intermedia</i>	Slender Wedge Grass	Poaceae	S4	•		f	r		r	•		f	f		•		
<i>Torreyochloa pallida</i>	Pale False Manna Grass	Poaceae	S5								r	r					
<i>Trisetum spicatum</i>	Narrow False Oats	Poaceae	S4			•			l			r	f				
<i>Sparganium emersum</i>	Green-fruited Burreed	Sparganiaceae	S5		f	r	l		l	l		r		r			
<i>Sparganium fluctuans</i>	Floating Burreed	Sparganiaceae	S4											r			
<i>Allium schoenoprasum</i> var. <i>Sibiricum</i>	Wild Chives	Liliaceae	S4			r											
<i>Allium tricoccum</i> var. <i>tricoccum</i>	Wild Leek	Liliaceae	S2													•	
<i>Clintonia borealis</i>	Yellow Bluebead Lily	Liliaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Lilium canadense</i>	Canada Lily	Liliaceae	S4	•					f								
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	Liliaceae	S5	•	c	c	c	•	c	c	c	c	c	c	•	c	c
<i>Maianthemum racemosum</i>	Large False Solomon's Seal	Liliaceae	S5									•			•		
<i>Maianthemum stellatum</i>	Starry False Solomon's Seal	Liliaceae	S4S5			r				•							
<i>Maianthemum trifolium</i>	Three-leaved False Soloman's Seal	Liliaceae	S5													•	
<i>Medeola virginiana</i>	Cucumber Root	Liliaceae	S5			r									•		
<i>Streptopus amplexifolius</i>	Clasping-leaved Twisted-stalk	Liliaceae	S5	•	f	f	c	•	f	r	c	f	c	f		c	c
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	Liliaceae	S5	•		c	c	•		r	r	•	u		•	f	u
<i>Triantha glutinosa</i>	Sticky False-Asphodel	Liliaceae	S3			f											
<i>Trillium cernuum</i>	Nodding Trillium	Liliaceae	S5		r		c		c	l	fc	r	f	fc	•	fc	u
<i>Trillium erectum</i>	Red Trillium	Liliaceae	S5	•	f	c	f	•	r	•		•					

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Trillium undulatum</i>	Painted Trillium	Liliaceae	S5	•								•	u	u			
<i>Veratrum viride</i>	Green False Hellebore	Liliaceae	S4	•	c	f	l		c	c				c			
<i>Iris versicolor</i>	Harlequin Blue Flag	Iridaceae	S5	•	f				l	f			•	r		r	
<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	Iridaceae	S5			r	r	•		f	r	•	r	r			
<i>Corallorhiza maculata</i>	Spotted Coralroot	Orchidaceae	S3S4			r											
<i>Corallorhiza trifida</i>	Early Coralroot	Orchidaceae	S4							•							
<i>Cypripedium acaule</i>	Pink Lady's-Slipper	Orchidaceae	S5			u								r			
<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's-Slipper	Orchidaceae	S2							•							
<i>Epipactis helleborine</i>	Helleborine	Orchidaceae	SNA	•	r	f	f	•	r	r	c	c	f	f	•	u	u
<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	Orchidaceae	S2											r			
<i>Goodyera repens</i>	Lesser Rattlesnake-plantain	Orchidaceae	S4			u											
<i>Goodyera tessellata</i>	Checkered Rattlesnake-Plantain	Orchidaceae	S4			r											
<i>Neottia auriculata</i>	Auricled Twayblade	Orchidaceae	S2S3							•							
<i>Neottia convallarioides</i>	Broad-Lip Twayblade	Orchidaceae	S4									•					
<i>Platanthera aquilonis</i>	Tall Northern Green Orchid	Orchidaceae	S4	•	u	u	r	•	r	c		r	r				
<i>Platanthera clavellata</i>	Club Spur Orchid	Orchidaceae	S4S5								r						
<i>Platanthera dilatata</i>	White Bog Orchid	Orchidaceae	S4			u							r				
<i>Platanthera orbiculata</i>	Small Round-leaved Orchid	Orchidaceae	S4	•						•							
<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	Orchidaceae	S4			r						r					
<i>Spiranthes romanzoffiana</i>	Hooded Ladies'-Tresses	Orchidaceae	S4								r					r	

APPENDIX 3. List of lichen species documented during surveys, with provincial status ranks (S-rank, see Appendix 1 for definitions).

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE														
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.	
<i>Acarospora glaucocarpa</i>	Rimmed Cobblestone Lichen	Acarosporaceae	SU								•				•			•
<i>Dibaeis baeomyces</i>	Pink Earth Lichen	Baeomycetaceae	S5				•				•	•				•	•	•
<i>Cladina arbuscula / mitis</i>	a reindeer lichen	Cladoniaceae	-							•					•			
<i>Cladina rangiferina</i>	Gray Reindeer Lichen	Cladoniaceae	S5	•	•		•		•	•			•	•		•	•	•
<i>Cladina stellaris</i>	Star-tipped Reindeer Lichen	Cladoniaceae	S5		•		•		•	•	•				•	•	•	
<i>Cladina terrae-novae</i>	Newfoundland Reindeer Lichen	Cladoniaceae	S3S4												•			
<i>Cladonia boryi</i>	Fishnet Lichen	Cladoniaceae	S4						•						•		•	
<i>Cladonia cenotea</i>	Powdered Funnel Lichen	Cladoniaceae	S5														•	
<i>Cladonia cervicornis ssp. verticillata</i>	Ladder Lichen	Cladoniaceae	S5								•					•	•	
<i>Cladonia cristatella</i>	British Soldiers Lichen	Cladoniaceae	S5						•						•		•	•
<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen	Cladoniaceae	S3															•
<i>Cladonia gracilis</i>	Cup Lichen	Cladoniaceae	S5												•			•
<i>Cladonia polycarpoides / subcariosa</i>	a reindeer lichen	Cladoniaceae	-															•
<i>Cladonia pyxidata</i>	Pebbled Pixie-cup Lichen	Cladoniaceae	S5					•							•			
<i>Cladonia squamosa</i>	Dragon Lichen	Cladoniaceae	S5					•	•			•	•	•		•		
<i>Cladonia strepsilis</i>	Olive Cladonia Lichen	Cladoniaceae	S3								•							
<i>Spilonema revertens</i>	Rock Hairball Lichen	Coccocarpiaceae	S1?		•													
<i>Collema cristatum</i>	Fingered Tarpaper Lichen	Collemataceae	SU								•							
<i>Collema furfuraceum</i>	Blistered Tarpaper Lichen	Collemataceae	SU		•													
<i>Collema fuscovirens</i>	Crumpled Rock Tarpaper Lichen	Collemataceae	SU		•		•			•			•	•	•			•
<i>Collema nigrescens</i>	Blistered Tarpaper Lichen	Collemataceae	S3										•					
<i>Collema sp.</i>	a tarpaper lichen	Collemataceae	-				•							•				
<i>Collema subflaccidum</i>	Tree Tarpaper Lichen	Collemataceae	S5				•	•	•	•	•	•	•	•				•
<i>Collema tenax</i>	Soil Tarpaper Lichen	Collemataceae	S1								•			•				
<i>Leptogium acadiense</i>	Acadian Jellyskin Lichen	Collemataceae	S4								•		•	•				•

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Leptogium cyanescens</i>	Blue Jellyskin Lichen	Collemataceae	S5		•		•	•	•			•	•	•	•		•
<i>Leptogium gelatinosum</i>	Rose-petalled Jellyskin Lichen	Collemataceae	S1S2									•					•
<i>Leptogium intermedium</i>	Forty-five Jellyskin Lichen	Collemataceae	S1									•					
<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen	Collemataceae	S3				•			•		•	•				
<i>Leptogium massiliense</i>	a jellyskin lichen	Collemataceae	SU							•							
<i>Leptogium schraderi</i>	Schrader's Jellyskin Lichen	Collemataceae	S1									•					
<i>Leptogium subtile</i>	Appressed Jellyskin Lichen	Collemataceae	S3?				•					•					
<i>Leptogium tenuissimum</i>	Birdnest Jellyskin Lichen	Collemataceae	SU				•										•
<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen	Collemataceae	S3S4				•										
<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen	Cystocoleaceae	S1S2		•							•					
<i>Loxospora ochrophaea</i>	Eastern Ragged-rim Lichen	Haematommataceae	SNR	•				•									
<i>Ephebe perspinulosa</i>	Thread Lichen	Lichinaceae	S1											•			
<i>Ephebe sp.</i>	a rockshag lichen	Lichinaceae	-		•									•			
<i>Euopsis granatina</i>	Lesser Rockbud Lichen	Lichinaceae	S1?		•												
<i>Phylliscum demangeonii</i>	Black Rock-wafer Lichen	Lichinaceae	SU											•			•
<i>Pyrenopsis sp.</i>	a pyrenopsis lichen	Lichinaceae	-														•
<i>Thermutis velutina</i>	Rockvelvet Lichen	Lichinaceae	S1?									•					
<i>Lobaria pulmonaria</i>	Lungwort Lichen	Lobariaceae	S5	•	•		•	•	•	•	•	•	•	•	•	•	•
<i>Lobaria quercizans</i>	Smooth Lung Lichen	Lobariaceae	S5	•			•		•	•	•			•			•
<i>Lobaria scrobiculata</i>	Textured Lungwort Lichen	Lobariaceae	S4S5						•	•	•						•
<i>Pseudocyphellaria perpetua</i>	Gilded Specklebelly Lichen	Lobariaceae	S3S4	•				•	•								
<i>Nephroma arcticum</i>	Arctic Kidney Lichen	Nephromataceae	S2?									•		•	•		
<i>Nephroma laevigatum</i>	Mustard Kidney Lichen	Nephromataceae	S2									•		•			
<i>Nephroma parile</i>	Powdery Kidney Lichen	Nephromataceae	S3S4	•	•	•			•		•	•					•
<i>Nephroma resupinatum</i>	Pimpled Kidney Lichen	Nephromataceae	S3		•	•		•									•
<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	Pannariaceae	S2									•					
<i>Fuscopannaria praetermissa</i>	Moss Shingles Lichen	Pannariaceae	SU							•		•					•

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE															
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.		
<i>Fuscopannaria sp.</i>	a shingle lichen	Pannariaceae	-										•						
<i>Pannaria conoplea</i>	Mealy-rimmed Shingle Lichen	Pannariaceae	S3S4								•		•						
<i>Pannaria rubiginosa</i>	Brown-eyed Shingle Lichen	Pannariaceae	S3S4					•			•								
<i>Parmeliella triptophylla</i>	Black-bordered Shingles Lichen	Pannariaceae	S4S5				•	•			•		•		•	•	•	•	•
<i>Parmeliella triptophylla / appalachensis</i>	a shingle lichen	Pannariaceae	-										•						
<i>Protopannaria pezizoides</i>	Brown-gray Moss-shingle Lichen	Pannariaceae	S3S4	•	•		•	•			•		•	•	•	•	•	•	•
<i>Vahliella leucophaea</i>	Shelter Shingle Lichen	Pannariaceae	S3S4		•								•	•	•	•	•	•	•
<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen	Parmeliaceae	S3					•			•								
<i>Arctoparmelia centrifuga</i>	Ripple Ring Lichen	Parmeliaceae	S4S5																•
<i>Cetrelia olivetorum</i>	Upside Seastorm Lichen	Parmeliaceae	S4S5								•	•							
<i>Evernia mesomorpha</i>	Boreal Oakmoss Lichen	Parmeliaceae	S5					•			•					•			
<i>Hypogymnia krogiae</i>	Freckled Tube Lichen	Parmeliaceae	S4S5					•			•								
<i>Hypogymnia physodes</i>	Monk's Hood Lichen	Parmeliaceae	S5	•			•	•	•		•	•	•	•					
<i>Melanelia panniformis</i>	Shingled Camouflage Lichen	Parmeliaceae	S3S4																•
<i>Melanelixia subaurifera</i>	Abrading Camouflage Lichen	Parmeliaceae	S5							•	•				•				
<i>Parmelia omphalodes</i>	Smoky Shield Lichen	Parmeliaceae	S4		•														
<i>Parmelia saxatilis</i>	Salted Shield Lichen	Parmeliaceae	S5		•							•			•				
<i>Parmelia squarrosa</i>	Bottlebrush Shield Lichen	Parmeliaceae	S5	•	•		•	•	•		•	•	•	•	•	•	•	•	•
<i>Parmelia sulcata</i>	Hammered Shield Lichen	Parmeliaceae	S5				•		•	•									
<i>Platismatia glauca</i>	Varied Rag Lichen	Parmeliaceae	S5						•			•		•	•				
<i>Platismatia tuckermanii</i>	Crumpled Rag Lichen	Parmeliaceae	S5	•									•						
<i>Punctelia rudecta</i>	Rough Speckleback Lichen	Parmeliaceae	S5	•	•		•		•	•	•	•	•	•					
<i>Usnea longissima</i>	Methuselah's Beard Lichen	Parmeliaceae	S4	•				•		•		•	•						•
<i>Usnocetraria oakesiana</i>	Yellow Band Lichen	Parmeliaceae	S4	•															
<i>Vulpicida pinastri</i>	Powdered Sunshine Lichen	Parmeliaceae	S5					•		•	•	•		•	•			•	•
<i>Massalongia carosa</i>	Rockmoss Rosette Lichen	Peltigeraceae	SU												•				

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE												
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.
<i>Peltigera aphthosa</i>	Common Freckle Pelt Lichen	Peltigeraceae	S4	•			•		•	•		•	•	•	•	•
<i>Peltigera canina</i>	Dog Lichen	Peltigeraceae	S4										•			
<i>Peltigera elisabethae</i>	Concentric Pelt Lichen	Peltigeraceae	S4	•			•			•		•	•		•	
<i>Peltigera evansiana</i>	Peppered Pelt Lichen	Peltigeraceae	S4	•			•			•		•			•	•
<i>Peltigera extenuata</i>	Sheepish Pelt Lichen	Peltigeraceae	SU							•		•	•			•
<i>Peltigera horizontalis</i>	Flat-fruited Pelt Lichen	Peltigeraceae	S4	•					•			•			•	
<i>Peltigera lepidophora</i>	Scaly Pelt Lichen	Peltigeraceae	S2							•		•	•			•
<i>Peltigera leucophlebia</i>	Ruffled Freckle Pelt Lichen	Peltigeraceae	S4							•		•				
<i>Peltigera membranacea</i>	Membranous Pelt Lichen	Peltigeraceae	S3	•						•		•	•		•	
<i>Peltigera neckeri</i>	Black-saddle Pelt Lichen	Peltigeraceae	SU							•						
<i>Peltigera polydactylon</i>	Many-fruited Pelt Lichen	Peltigeraceae	S4S5	•				•	•			•	•			
<i>Peltigera praetextata</i>	Born-again Pelt Lichen	Peltigeraceae	SU													•
<i>Peltigera rufescens</i>	Black-bellied Pelt Lichen	Peltigeraceae	S5							•						
<i>Peltigera sp.</i>	a pelt lichen	Peltigeraceae	-						•	•						
<i>Peltigera venosa</i>	Fan Pelt Lichen	Peltigeraceae	S1?	•								•		•		
<i>Solorina saccata</i>	Woodland Owl Lichen	Peltigeraceae	S3	•	•		•			•	•	•	•		•	•
<i>Heterodermia neglecta</i>	Fringe Lichen	Physciaceae	S4					•	•							
<i>Heterodermia speciosa</i>	Powdered Fringe Lichen	Physciaceae	S4	•	•			•				•				
<i>Phaeophyscia adiastrata</i>	Powder-tipped Shadow Lichen	Physciaceae	SU		•							•				
<i>Phaeophyscia decolor</i>	Lesser Eye Shadow Lichen	Physciaceae	S1										•			
<i>Phaeophyscia rubropulchra</i>	Orange-cored Shadow Lichen	Physciaceae	S5				•	•		•		•				
<i>Phaeophyscia sciastra</i>	Dark Shadow Lichen	Physciaceae	SU										•			
<i>Physcia caesia</i>	Blue-gray Rosette Lichen	Physciaceae	SU		•							•				
<i>Physconia grumosa</i>	a frost lichen	Physciaceae	SU		•											
<i>Pyxine soorediata</i>	Mustard Lichen	Physciaceae	S4							•						
<i>Dendriscocaulon intricatum</i>	Olive-thorn Lichen	Placynthiaceae	SU					•								

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE													
				Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Placynthium nigrum</i>	Common Ink Lichen	Placynthiaceae	SU				•			•		•					•
<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen	Placynthiaceae	SU										•				
<i>Psorula rufonigra</i>	Blue-edged Scale Lichen	Psoraceae	SU		•												
<i>Ramalina americana</i>	Sinewed Ramalina Lichen	Ramalinaceae	S4S5					•									
<i>Ramalina dilacerata</i>	Punctured Ramalina Lichen	Ramalinaceae	S4S5							•							
<i>Ramalina intermedia</i>	Rock Ramalina Lichen	Ramalinaceae	S4								•	•		•			
<i>Ramalina roesleri</i>	Frayed Ramalina Lichen	Ramalinaceae	S4S5	•													
<i>Rhizocarpon geographicum</i>	Yellow Map Lichen	Rhizocarpaceae	SNR														•
<i>Umbilicaria americana</i>	Frosted Rocktripe Lichen	Umbilicariaceae	S4										•				
<i>Umbilicaria deusta</i>	Peppered Rocktripe Lichen	Umbilicariaceae	S4S5						•		•		•			•	
<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen	Verrucariaceae	S3S4	•	•					•	•	•	•	•		•	

APPENDIX 4. List of bryophyte species documented during surveys, with provincial status ranks (S-rank, see Appendix 1 for definitions). All bryophyte occurrence information was collected by T.H. Neily.

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquitich R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Amblystegium serpens</i>	Creeping Feather Moss	Amblystegiaceae	S4S5			•	•		•	
<i>Amblystegium varium</i>	Willow Feather Moss	Amblystegiaceae	S4S5				•	•		
<i>Campylium chrysophyllum</i>	Golden Creeping Moss	Amblystegiaceae	S5		•	•		•		•
<i>Campylium hispidulum</i>	Common Fine Wet Moss	Amblystegiaceae	S4S5		•	•				
<i>Campylium radicale</i>	Long-stalked Fine Wet Moss	Amblystegiaceae	S1S2						•	
<i>Campylium stellatum</i>	Yellow Starry Fen Moss	Amblystegiaceae	S4S5			•				
<i>Cratoneuron filicinum</i>	Fern-leaved Hook Moss	Amblystegiaceae	S4S5						•	
<i>Hygroamblystegium fluviatile</i>	Brookside Feather Moss	Amblystegiaceae	S5	•						
<i>Hygrohypnum bestii</i>	Best's Brook Moss	Amblystegiaceae	S1S2						•	
<i>Hygrohypnum duriusculum</i>	Broad-leaved Brook Moss	Amblystegiaceae	S4S5				•			
<i>Hygrohypnum eugyrium</i>	Western Brook Moss	Amblystegiaceae	S4S5					•	•	
<i>Hygrohypnum luridum</i>	Drab Brook Moss	Amblystegiaceae	S5			•				
<i>Warnstorfia fluitans</i>	Floating Hook Moss	Amblystegiaceae	S5	•						
<i>Andreaea rupestris</i>	Black Rock Moss	Andreaeaceae	S5	•			•		•	
<i>Anomodon attenuatus</i>	Slender Anomodon Moss	Anomodontaceae	S5		•		•			•
<i>Anomodon rostratus</i>	Common Anomodon Moss	Anomodontaceae	S5				•			
<i>Anomodon viticulosus</i>	Rambling Tail Moss	Anomodontaceae	S2			•				
<i>Bartramia pomiformis</i>	Common Apple Moss	Bartramiaceae	S5	•	•		•	•	•	
<i>Philonotis fontana</i>	Fountain Apple Moss	Bartramiaceae	S5	•			•	•	•	•
<i>Plagiopus oederiana</i>	Oeder's Apple Moss	Bartramiaceae	S4S5		•			•		
<i>Brachythecium plumosum</i>	Rusty Ragged Moss	Brachytheciaceae	S5	•						
<i>Brachythecium rivulare</i>	River Ragged Moss	Brachytheciaceae	S5	•						

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquit R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Brachythecium sp.</i>	a ragged moss	Brachytheciaceae	-		•	•	•	•	•	•
<i>Brachythecium starkei</i>	Starke's Ragged Moss	Brachytheciaceae	S5						•	
<i>Bryhnia novae-angliae</i>	New England Bryhnia Moss	Brachytheciaceae	S5		•			•		
<i>Eurhynchium pulchellum</i>	Elegant Beaked Moss	Brachytheciaceae	S5		•				•	•
<i>Platyhypnidium riparioides</i>	Long-beaked Water Feather-moss	Brachytheciaceae	S5	•	•			•		
<i>Bryum pseudotriquetrum</i>	Common Green Bryum Moss	Bryaceae	S5	•						
<i>Bryum sp.</i>	a bryum moss	Bryaceae	-		•	•	•		•	
<i>Bryum uliginosum</i>	Swamp Bryum	Bryaceae	S2S3				•		•	
<i>Leptobryum pyriforme</i>	Golden Thread Moss	Bryaceae	S4S5			•				
<i>Pohlia cruda</i>	Opal Nodding Moss	Bryaceae	S5			•				
<i>Pohlia sp.</i>	a nodding moss	Bryaceae	-							•
<i>Pohlia wahlenbergii</i>	Wahlenberg's Nodding Moss	Bryaceae	S4S5		•					
<i>Nowellia curvifolia</i>	Wood Rustwort	Cephaloziaceae	S5		•	•	•		•	
<i>Climacium dendroides</i>	Northern Tree Moss	Climaciaceae	S5	•		•	•	•	•	
<i>Conocephalum salebrosum</i>	Snake Liverwort	Conocephalaceae	S5				•		•	
<i>Cynodontium alpestre</i>	Mountain Dogtooth Moss	Dicranaceae	SNA							•
<i>Dichodontium pellucidum</i>	Transparent Fork Moss	Dicranaceae	S5				•			
<i>Dicranella schreberiana</i>	Schreber's Forklet Moss	Dicranaceae	S4S5		•					
<i>Dicranum fulvum</i>	Fine-leaved Broom Moss	Dicranaceae	S5			•	•			
<i>Dicranum fuscescens</i>	Curly Heron's-bill Moss	Dicranaceae	S5	•	•		•	•	•	
<i>Dicranum montanum</i>	Mountain Broom Moss	Dicranaceae	S5		•	•	•	•	•	
<i>Dicranum polysetum</i>	Wavy-leaved Broom Moss	Dicranaceae	S5			•			•	
<i>Dicranum scoparium</i>	Common Broom Moss	Dicranaceae	S5	•		•	•		•	
<i>Dicranum spurium</i>	Spurred Broom Moss	Dicranaceae	S2?	•						
<i>Dicranum viride</i>	Green Broom Moss	Dicranaceae	S5			•				•

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquit R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Oncophorus wahlenbergii</i>	Wahlenberg's Spur Moss	Dicranaceae	S5	•						
<i>Distichium capillaceum</i>	Erect-fruited Iris Moss	Ditrichaceae	S4?	•	•	•	•	•		•
<i>Ditrichum flexicaule</i>	Flexible Cow-hair Moss	Ditrichaceae	S2	•						
<i>Saelania glaucescens</i>	Blue Dew Moss	Ditrichaceae	S2S3			•	•	•	•	•
<i>Encalypta ciliata</i>	Fringed Extinguisher Moss	Encalyptaceae	S3S4		•		•		•	•
<i>Encalypta procer</i>	Slender Extinguisher Moss	Encalyptaceae	S4S5	•	•					•
<i>Fissidens adianthoides</i>	Maidenhair Pocket Moss	Fissidentaceae	S5			•		•		
<i>Fissidens bryoides</i>	Lesser Pocket Moss	Fissidentaceae	S3S4			•		•		
<i>Fissidens dubius</i>	Rock Pocket Moss	Fissidentaceae	S5	•			•	•	•	
<i>Fissidens osmundoides</i>	a Pocket Moss	Fissidentaceae	S5	•		•		•		
<i>Racomitrium aciculare</i>	Yellow Fringe-moss	Grimmiaceae	S5						•	
<i>Schistidium apocarpum</i>	Radiate Bloom Moss	Grimmiaceae	S5	•		•		•		•
<i>Schistidium rivulare</i>	River Bloom Moss	Grimmiaceae	S5			•	•			
<i>Hedwigia ciliata</i>	Ciliate Hedwigia Moss	Hedwigiaceae	S5	•					•	•
<i>Hylocomium splendens</i>	Stairstep Moss	Hylocomiaceae	S5	•	•	•	•	•	•	•
<i>Rhytidiadelphus triquetrus</i>	Electrified Cat's-tail Moss	Hylocomiaceae	S5		•	•				
<i>Pleurozium schreberi</i>	Red-stemmed Feather Moss	Hylocomiaceae	S5	•	•	•	•	•	•	
<i>Hypnum cupressiforme</i>	Cypress-leaved Plait Moss	Hypnaceae	S4S5	•		•	•	•		
<i>Hypnum cupressiforme var. filiforme</i>	Filiform Plait Moss	Hypnaceae	S2S3				•		•	
<i>Hypnum imponens</i>	Pellucid Plait Moss	Hypnaceae	S5		•	•				
<i>Hypnum lindbergii</i>	Lindberg's Plait Moss	Hypnaceae	S5	•						
<i>Ptilium crista-castrensis</i>	Knight's Plume Moss	Hypnaceae	S5	•	•	•				
<i>Pylaisia intricata</i>	Intricate Pylaisia Moss	Hypnaceae	S5			•	•			
<i>Pylaisiella polyantha</i>	Many-flowered Leskea Moss	Hypnaceae	S5					•	•	
<i>Frullania eboracensis</i>	York Scalewort	Jubulaceae	S5		•	•			•	

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquit R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Frullania tamarisci</i> ssp. <i>asagrayana</i>	Tamarisk Scalewort	Jubulaceae	S5			•				•
<i>Jungermannia leiantha</i>	Long-leaved Flapwort	Jungermanniaceae	S4S5			•				
<i>Lejeunea cavifolia</i>	Least Pouncewort	Lejeuneaceae	S4S5			•	•		•	
<i>Bazzania trilobata</i>	Three-lobed Whipwort	Lepidoziaceae	S5			•	•	•	•	•
<i>Lepidozia reptans</i>	Creeping Fingerwort	Lepidoziaceae	S5		•					
<i>Pseudoleskeella tectorum</i>	Rooftop Leskea Moss	Leskeaceae	S1					•		
<i>Leucodon andrewsianus</i>	Andrew's Leucodon Moss	Leucodontaceae	S5					•		
<i>Preissia quadrata</i>	Narrow-lobed Mushroom-headed Liverwort	Marchantiaceae	S5	•	•	•	•	•		
<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss	Mniaceae	S2S3					•		
<i>Mnium hornum</i>	Swan's-neck Leafy Moss	Mniaceae	S4S5	•	•		•			
<i>Plagiomnium ciliare</i>	Toothed Leafy Moss	Mniaceae	S5	•		•				
<i>Plagiomnium cuspidatum</i>	Woodsy Leafy Moss	Mniaceae	S5				•			
<i>Rhizomnium appalachianum</i>	Appalachian Leafy Moss	Mniaceae	S5					•		
<i>Rhizomnium punctatum</i>	Dotted Leafy Moss	Mniaceae	S5	•			•		•	
<i>Homalia trichomanoides</i>	Common Flat-branch Moss	Neckeraceae	S4S5	•	•	•		•	•	
<i>Neckera pennata</i>	Feathery Neckera Moss	Neckeraceae	S5	•	•	•	•	•		•
<i>Amphidium lapponicum</i>	Lapland Amphidium Moss	Orthotrichaceae	S4S5	•			•	•		•
<i>Orthotrichum speciosum</i>	Showy Bristle Moss	Orthotrichaceae	S2S3		•	•	•			•
<i>Ulota coarctata</i>	Club Pincushion Moss	Orthotrichaceae	S5		•	•				
<i>Ulota crispa</i>	Crisped Pincushion Moss	Orthotrichaceae	S5		•	•	•	•		•
<i>Pellia epiphylla</i>	Common Pellia	Pelliaceae	S5	•		•	•	•	•	
<i>Pellia neesiana</i>	Nees' Pellia	Pelliaceae	S4S5				•			
<i>Plagiochila porelloides</i>	Lesser Featherwort	Plagiochilaceae	S5	•	•		•	•	•	
<i>Plagiothecium laetum</i>	Bright Silk Moss	Plagiotheciaceae	S5					•		
<i>Atrichum crispulum</i>	Crispy Smoothcap Moss	Polytrichaceae	S5							•

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquit R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Pogonatum urnigerum</i>	Urn Hair Moss	Polytrichaceae	S5		•					
<i>Polytrichum commune</i>	Common Haircap Moss	Polytrichaceae	S5	•				•		
<i>Polytrichum juniperinum</i>	Juniper Haircap Moss	Polytrichaceae	S5	•	•			•		•
<i>Porella platyphylla</i>	Wall Scalewort	Porellaceae	S5			•			•	•
<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss	Pottiaceae	S3S4					•		
<i>Bryoerythrophyllum recurvirostre</i>	Red Beard Moss	Pottiaceae	S4S5			•		•		
<i>Didymodon ferrugineus</i>	Rusty Beard Moss	Pottiaceae	S2				•			
<i>Gymnostomum aeruginosum</i>	Tufted Rock Beardless Moss	Pottiaceae	S5				•	•	•	
<i>Hymenostylium recurvirostre</i>	Hymenostylium Moss	Pottiaceae	S3		•	•	•	•		
<i>Tortella fragilis</i>	Fragile Twisted Moss	Pottiaceae	S3		•	•				
<i>Tortella tortuosa</i>	Frizzled Crisp Moss	Pottiaceae	S5		•	•	•	•		•
<i>Trichostomum tenuirostre</i>	Acid-Soil Moss	Pottiaceae	S3S4				•			
<i>Blepharostoma trichophyllum</i>	Hairy Threadwort	Pseudolepicoleaceae	S5		•			•		
<i>Heterocladium dimorphum</i>	Dimorphous Tangle Moss	Pterigynandraceae	S3S4				•			
<i>Myurella julacea</i>	Small Mouse-tail Moss	Pterigynandraceae	S3S4		•	•	•	•		•
<i>Myurella sibirica</i>	Siberian Myurella Moss	Pterigynandraceae	S5		•	•				•
<i>Pterigynandrum filiforme</i>	Capillary Wing Moss	Pterigynandraceae	S4S5			•			•	
<i>Ptilidium ciliare</i>	Ciliate Fringewort	Ptilidiaceae	S5	•		•		•	•	
<i>Ptilidium pulcherrimum</i>	Tree Fringewort	Ptilidiaceae	S5			•				•
<i>Radula complanata</i>	Flat-leaved Scalewort	Radulaceae	S5		•	•		•	•	
<i>Scapania nemorosa</i>	Grove Earwort	Scapaniaceae	S5	•	•					•
<i>Blindia acuta</i>	Sharp-leaved Blindia	Seligeriaceae	S4?		•					
<i>Seligeria brevifolia</i>	Shortleaf Bristle Moss	Seligeriaceae	S1S2		•			•		
<i>Seligeria campylopoda</i>	Small Limestone Moss	Seligeriaceae	S2?	•						
<i>Sphagnum girgensohnii</i>	Green Peat Moss	Sphagnaceae	S5	•				•	•	

SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	SURVEY SITE						
				Whites Bk. (upper)	Cheuters Bk.	Northwest Upsalquitck R.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Upper McNair Bk.
<i>Tetraphis pellucida</i>	Common Four-tooth Moss	Tetraphidaceae	S5		•		•	•		
<i>Abietinella abietina</i>	Wiry Fern Moss	Thuidiaceae	S3S4	•					•	•
<i>Thuidium delicatulum</i>	Delicate Fern Moss	Thuidiaceae	S5		•	•	•	•		
<i>Thuidium recognitum</i>	Hook-leaved Fern Moss	Thuidiaceae	S5			•				

APPENDIX 5. List of animal species documented incidentally during surveys, with provincial status ranks (S-rank, see Appendix 1 for definitions).

				SURVEY SITE													
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
BIRD	<i>Buteo jamaicensis</i>	Red-tailed Hawk	Accipitridae	S4									•				
	<i>Circus hudsonius</i>	Northern Harrier	Accipitridae	S4B, S4S5M						•							
	<i>Pandion haliaetus</i>	Osprey	Accipitridae	S4S5B, S5M				•									
	<i>Megaceryle alcyon</i>	Belted Kingfisher	Alcedinidae	S5B, S5M	•	•	•				•		•		•		•
	<i>Anas rubripes</i>	American Black Duck	Anatidae	S5B, S4N, S5M							•						
	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Anatidae	S1B, S1S2N, S2M										•			
	<i>Ardea Herodias</i>	Great Blue Heron	Ardeidae	S4B, S4M									•				
	<i>Bombycilla cedrorum</i>	Cedar Waxwing	Bombycillidae	S5B, S5M	•	•	•	•	•	•	•						
	<i>Chordeiles minor</i>	Common Nighthawk	Caprimulgidae	S3B, S4M			•		•		•						
	<i>Certhia americana</i>	Brown Creeper	Certhiidae	S5			•			•	•						
	<i>Corvus corax</i>	Common Raven	Corvidae	S5									•				
	<i>Cyanocitta cristata</i>	Blue Jay	Corvidae	S5		•	•	•	•	•	•		•	•			
	<i>Perisoreus canadensis</i>	Canada Jay	Corvidae	S4			•										
	<i>Junco hyemalis</i>	Dark-eyed Junco	Emberizidae	S5		•	•		•		•						
	<i>Melospiza lincolni</i>	Lincoln's Sparrow	Emberizidae	S4B, S5M		•	•				•						
	<i>Melospiza melodia</i>	Song Sparrow	Emberizidae	S5B, S5M		•	•				•						
	<i>Zonotrichia albicollis</i>	White-throated Sparrow	Emberizidae	S5B, S5M		•	•	•	•	•	•					•	
	<i>Falco columbarius</i>	Merlin	Falconidae	S5B, S5M							•						

				SURVEY SITE													
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitich R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Fringillidae	S3B, S3S4N, SUM			•		•		•					•		
<i>Haemorhous purpureus</i>	Purple Finch	Fringillidae	S4S5B, SUN, S5M							•							
<i>Spinus pinus</i>	Pine Siskin	Fringillidae	S3		•	•				•							
<i>Spinus tristis</i>	American Goldfinch	Fringillidae	S5		•	•	•		•	•			•	•		•	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	Icteridae	S4B, S4M		•												
<i>Quiscalus quiscula</i>	Common Grackle	Icteridae	S5B, S5M		•												
<i>Poecile atricapillus</i>	Black-capped Chickadee	Paridae	S5		•	•		•	•	•				•	•		
<i>Poecile hudsonicus</i>	Boreal Chickadee	Paridae	S4			•				•	•			•			
<i>Cardellina canadensis</i>	Canada Warbler	Parulidae	S3B, S3M	•	•	•				•							
<i>Geothlypis philadelphia</i>	Mourning Warbler	Parulidae	S4B, S5M		•	•				•							
<i>Geothlypis trichas</i>	Common Yellowthroat	Parulidae	S5B, S5M			•											
<i>Oreothlypis ruficapilla</i>	Nashville Warbler	Parulidae	S5B, S5M			•											
<i>Parkesia noveboracensis</i>	Northern Waterthrush	Parulidae	S4B, S5M		•	•				•							
<i>Setophaga americana</i>	Northern Parula	Parulidae	S5B, S5M			•		•		•							
<i>Setophaga caerulescens</i>	Black-throated Blue Warbler	Parulidae	S5B, S5M							•							
<i>Setophaga castanea</i>	Bay-breasted Warbler	Parulidae	S4B, S4S5M		•	•				•							
<i>Setophaga coronata</i>	Yellow-rumped Warbler	Parulidae	S5B, S5M		•	•				•							
<i>Setophaga fusca</i>	Blackburnian Warbler	Parulidae	S5B, S5M							•							
<i>Setophaga magnolia</i>	Magnolia Warbler	Parulidae	S5B, S5M	•	•	•			•	•							
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	Parulidae	S5B, S5M		•												
<i>Setophaga ruticilla</i>	American Redstart	Parulidae	S5B, S5M							•							

BIRD

				SURVEY SITE														
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.	
BIRD	<i>Setophaga tigrina</i>	Cape May Warbler	Parulidae	S3B, S4S5M			•											
	<i>Setophaga virens</i>	Black-throated Green Warbler	Parulidae	S5B, S5M			•											
	<i>Bonasa umbellus</i>	Ruffed Grouse	Phasianidae	S5		•	•		•		•	•						
	<i>Colaptes auratus</i>	Northern Flicker	Picidae	S5B, S5M		•	•			•	•							
	<i>Dryobates pubescens</i>	Downy Woodpecker	Picidae	S5			•				•			•				•
	<i>Dryobates villosus</i>	Hairy Woodpecker	Picidae	S5		•												
	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	Picidae	S5B, S5M							•							
	<i>Regulus calendula</i>	Ruby-crowned Kinglet	Regulidae	S4B, S5M							•							
	<i>Regulus satrapa</i>	Golden-crowned Kinglet	Regulidae	S5		•	•		•	•	•							
	<i>Actitis macularius</i>	Spotted Sandpiper	Scolopacidae	S3S4B, S5M		•	•			•	•				•		•	
	<i>Gallinago delicata</i>	Wilson's Snipe	Scolopacidae	S3S4B, S5M						•								
	<i>Scolopax minor</i>	American Woodcock	Scolopacidae	S5B, S5M		•		•			•							
	<i>Sitta canadensis</i>	Red-breasted Nuthatch	Sittidae	S5		•	•		•	•	•				•			
	<i>Sitta carolinensis</i>	White-breasted Nuthatch	Sittidae	S4							•							
	<i>Archilochus colubris</i>	Ruby-throated Hummingbird	Trochilidae	S5B, S5M			•									•		
	<i>Troglodytes hiemalis</i>	Winter Wren	Troglodytidae	S5B, S5M	•		•	•	•	•	•							
	<i>Catharus fuscescens</i>	Veery	Turdidae	S4B, S4M		•				•	•							
	<i>Catharus guttatus</i>	Hermit Thrush	Turdidae	S5B, S5M		•	•		•		•							
	<i>Catharus ustulatus</i>	Swainson's Thrush	Turdidae	S5B, S5M		•	•		•		•							
	<i>Turdus migratorius</i>	American Robin	Turdidae	S5B, S5M	•	•	•	•	•	•	•							
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Tyrannidae	S3B, S3M	•	•	•	•			•								

					SURVEY SITE												
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitich R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
BIRD	<i>Empidonax alnorum</i>	Alder Flycatcher	Tyrannidae	S5B, S5M			•	•	•		•					•	
	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	Tyrannidae	S4S5B, S5M		•				•							
	<i>Empidonax minimus</i>	Least Flycatcher	Tyrannidae	S5B, S5M		•											
	<i>Vireo olivaceus</i>	Red-eyed Vireo	Vireonidae	S5B, S5M		•	•			•	•						
	<i>Vireo solitarius</i>	Blue-headed Vireo	Vireonidae	S5B, S5M		•	•		•	•	•						
MAMMAL	<i>Castor canadensis</i>	American Beaver	Castoridae	S5				•									
	<i>Alces americanus</i>	Moose	Cervidae	S5				•		•			•		•		•
	<i>Odocoileus virginianus</i>	White-tailed Deer	Cervidae	S5									•				
	<i>Martes americana</i>	American Marten	Mustelidae	S4	•					•							
	<i>Tamiasciurus hudsonicus</i>	Red Squirrel	Sciuridae	S5				•	•	•	•						
	<i>Ursus americanus</i>	American Black Bear	Ursidae	S5												•	•
FISH	<i>Salvelinus fontinalis</i>	Brook Trout	Salmonidae	S4													
HERPTILE	<i>Storeria occipitomaculata occipitomaculata</i>	Northern Redbelly Snake	Colubridae	S5									•				
	<i>Thamnophis sirtalis pallidulus</i>	Maritime Garter Snake	Colubridae	S5		•		•								•	
	<i>Anaxyrus americanus</i>	American Toad	Bufo	S5		•				•							
	<i>Anaxyrus americanus americanus</i>	Eastern American Toad	Bufo	S5	•				•								
	<i>Lithobates clamitans</i>	Green Frog	Ranidae	S5											•		
	<i>Lithobates sylvaticus</i>	Wood Frog	Ranidae	S5										•		•	•
INV.	<i>Cambarus bartonii</i>	Appalachian Brook Crayfish	Cambaridae	S5						•							
	<i>Bombus borealis</i>	Northern Amber Bumblebee	Apidae	S5									•	•			
	<i>Bombus ternarius</i>	Tri-coloured Bumblebee	Apidae	S5									•	•			•

				SURVEY SITE													
SCIENTIFIC NAME	COMMON NAME	FAMILY	NB S-rank	Whites Bk. (lower)	Whites Bk. (upper)	Lower Grindstone Bk.	Cheuters Bk.	Jardine Bk.	Grog Bk.	Northwest Upsalquitch R.	Narrows Bk.	Charlo R.	South Charlo R.	South Branch Benjamin R.	Louison R.	Lwr. McNair Bk.	Upp. McNair Bk.
INVERTEBRATE	<i>Bombus impatiens</i>	Common Eastern Bumblebee	Apidae	S5									•				
	<i>Apis mellifera</i>	Honeybee	Apidae	SNA									•				
	<i>Papilio canadensis</i>	Canadian Tiger Swallowtail	Papilionidae	S5				•									
	<i>Limenitis archippus</i>	Viceroy	Nymphalidae	S5	•												
	<i>Haploa confusa</i>	Confused Haploa	Arctiidae	SU							•						
	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail	Gomphidae	S4		•											
	<i>Calopteryx maculata</i>	Ebony Jewelwing	Calopterygidae	S4											•		