Atlantic Canada CDC Canada Atlantique

# Rare Plant Inventory of Lakes in the Ponhook-Molega Lakes Region

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**Report to Nova Scotia Species at Risk Conservation Fund**

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Atlantic Canada Conservation Data Centre Botanist David Mazerolle, recording data at Third Christopher Lake, Queens County. The tall, broad-leaved grass at the lake margin is the native Common Reed (*Phragmites australis*, probably the native ssp. *americanus*), which although non-rare (S4, Secure) in Nova Scotia is otherwise known from only one inland lakeshore site in southern Nova Scotia. Several provincially rare species were also present at this location.

# Introduction

The Atlantic Coastal Plain Flora are a suite of species disjunct in southern Nova Scotia from their main ranges along the U.S. eastern seaboard. Most are lakeshore and wetland species and many occur nowhere else in Canada. Two regions of Nova Scotia have especially high concentrations of at-risk Atlantic Coastal Plain lakeshore plants: 1) the lower Tusket River valley, which is fairly well surveyed on its major lakes and 2) the Kejimkujik and middle Medway River area, which has generally been poorly surveyed outside the National Park and Ponhook and Molega Lakes. Lakeshore cottage and rural residential development in both regions is expanding rapidly, making precise occurrence information on species-at-risk especially valuable for conservation.

Our interest in pursuing this project was driven by the limited botanical survey effort on most lakes in the Kejimkujik - middle Medway River region and their high potential for supporting species at risk given their proximity to known sites and the likelihood that they supported suitable habitat for Atlantic Coastal Plain flora. Lakeshores in the Kejimkujik and middle Medway River area are known to support five COSEWIC-listed plants, one provincially Endangered plant, four plant species with national General Status Ranks of May be At Risk and four plant species with provincial General Status Ranks of May be At Risk. Many additional provincially rare Atlantic Coastal Plain and other rare plant species are known from the study region as well.

This project involved 57 person days of fieldwork in 2007 and 2008 on 20 different lakes and one segment of the Medway River, resulting in the documentation of over 1,300 locations of 50 provincially rare vascular plant species, including three federally listed species at risk, one provincially listed species at risk and at least one new provincial record. It has significantly increased our understanding of the distribution and status of Nova Scotia's rare flora, particularly the province's nationally significant assemblage of Atlantic Coastal Plain Flora. All species-level data obtained during the project is permanently documented in the AC CDC database where it will be accessed for species' conservation status re-assessment, land-use planning and other conservation purposes.

Our documentation of sites of high conservation value supporting especially rare species or concentrations of rare species is likely to prove especially valuable over in the coming decades because shoreline in the study region is among the most valued for recreational or rural residential development in all of Nova Scotia. Regional shoreline development within the past 10 years has been extensive with much more likely in the near future, causing further impacts on rare species and habitats. The improved knowledge of rare species' status and specific locations provided by this project will help to mitigate these impacts.

# Methods

### Scope of work covered in this report

AC CDC submitted the proposal for this work to the Nova Scotia Species at Risk Conservation Fund in June 2007 and we completed some fieldwork on the project in August – September 2007, prior to receiving confirmation of funding. Thus we are reporting here on 2007 and 2008 fieldwork, although we were only able to invoice the Species at Risk Conservation Fund for 2008 fieldwork. The 2007 work was supported in part by funding from Environment Canada towards the completion of a COSEWIC update status report on Redroot (*Lachnanthes caroliniana*) and the 2008 work was supported in part by funding from the Endangered Species Recovery Fund administered by World Wildlife Fund Canada.

### Study Area and Site Selection

Study sites are mapped in Figure 1 and include lakes in the watersheds of the Medway and Lahave Rivers in Queens and Lunenburg Counties. All lakes were within 12 km of Ponhook or Molega Lakes, where high concentrations of rare species were previously documented. Lakes were selected for survey using the following criteria, presented in approximate order of importance:

a) Natural water level fluctuation – water level fluctuation is key to maintaining habitats for several target species. Lakes presently controlled by large dams are eliminated from consideration;

b) Size – larger is better because of greater wave energy tending to create more and larger beach habitats;

c) Proximity to Ponhook and Molega Lakes and other target species locations – closer is better because new populations are generally most likely to be found near known populations;

d) Shoreline shape – more convoluted with islands and bays is better because of greater diversity of shoreline types and greater likelihood of broad beach habitats;

e) Watershed – Medway River system is better than others because it has the best populations of target species and dispersal events are more likely within than between watersheds;

f) Previous botanical effort (as shown by collections databased from Acadia and Nova Scotia Museum herbaria, as well as discussion with John Mills, Ruth Newell and Nick Hill) – intensively surveyed lakes excluded, fewer previous collections better;

g) Position in watershed – closer to main branch of river is better and lower in watershed is better, because experience suggests rare coastal plain flora are more likely in these lake types, likely because of greater magnitude of water level fluctuation.

**Field Coverage**

We covered field sites between July 11 and September 10, 2007 and August 11 and September 13, 2008. Coverage was predominantly by AC CDC botanists Sean Blaney and David Mazerolle and in 2007 by Tyler Smith, Saint Mary's University, under contract to the AC CDC. We had assistance at some sites from AC CDC Botany Technicians Erica Oberndorfer (2007) and Jesse McNicholl (2008) and from Nova Scotia Department of Natural Resources' Sherman Boates (one day in 2007), Peter Hope (one day in 2008), Megan Crowley of Parks Canada (one day in 2008) and Bradley Toms of Environment Canada, Canadian Wildlife Service (one day 2008). Table 1 indicates field days and observers at each site. In all, we spent roughly 396 AC CDC person hours (53 person days) on fieldwork, including travel and specimen processing, over 16 calendar days in the field. Of this time, approximately 234 hours (31 person days) was spent searching for plants in the field. Volunteers contributed an additional 32 person hours in the field.

Shoreline coverage involved a mix of canoe-based tracking of the shoreline as close to the shore as was possible, and on-foot coverage. At each lake, as much shoreline was covered as time allowed, except at First Christopher Lake, which was only visited briefly at two easily accessible points. Figure 1 maps the areas covered precisely. Each botanist kept GPS units on while in the field to precisely record area covered. We compiled full vascular plant species lists with a general abundance ranking for every species at each site. Te following four qualifiers were used to characterize the relative on-site abundance of species: *rare* – present in small numbers at very few locations; *uncommon* – present at roughly four or five sites in small numbers or one or two sites in large numbers; *fairly common* – widespread at the site but generally not in very high numbers; *common* – widespread at the site and present in large numbers.

For provincially rare species (those species with S-ranks of S1 to S3S4; S-ranks defined at www.natureserve.org/explorer/ranking.htm#globalstatus), we recorded locations by GPS, along with

information on population size and extent, habitat and associated species. A majority of rare species occurrences recorded were also documented by voucher specimens that will be deposited at the E.C. Smith Herbarium at Acadia University, Wolfville and the Nova Scotia Provincial Museum of Natural History herbarium in Halifax herbarium at Saint John. All species data (species lists by site with generalized locations and all precisely documented records) will be permanently maintained in the Atlantic Canada Conservation Data Centre database.

## Results

We recorded 50 provincially rare plant species from more than 1300 different GPS locations in all. These rare plant records represented 279 rare plant species x survey site combinations (i.e. twenty GPS points for a rare species at one lake = one species x survey site combination). All provincially rare species and the survey sites at which they were observed are listed in Table 2.

Some of the most interesting rare species records are highlighted individually below, with provincial S-ranks and General Status ranks.

Veined Meadowrue (*Thalictrum venulosum* - [S1], [Not Assessed])
This species is not yet definitively known for NS, although there is a probable specimen from River Hebert, Cumberland County that is currently being evaluated by Tony Reznicek at University of Michigan. We found what appears to be this species from one shoreline location on Hirtle Lake, where only small, infertile plants were present. Its identity will also be determined by Tony Reznicek in the coming year. The species is uncommon but widespread within New Brunswick, mostly from river shores, with one record known from PEI, thus it is not entirely unexpected in NS.

Torrey's Bulrush (*Schoenoplectus torreyi* - S1, Not Assessed)
Our records on Long and Russell Lakes are the first sites recorded for the species in Nova Scotia. It is a widespread but generally uncommon species east of the Mississippi River from Virginia to Quebec and New Brunswick. In New Brunswick it is ranked S3 and is known primarily from the southwest portion of the province, although it is locally abundant around the upstream limit of tides on the Miramichi River and there is a single record from the Moncton area mapped in Hinds (2000).

Canada Frostweed (*Helianthemum canadense* - S1, May Be At Risk)
This species (Figure 2) of sand barrens and other dry, naturally open habitats has recently been listed as provincially Endangered. There have been historic and recent records from sand barrens around Greenfield, but our record on Ponhook Lake was found on the upper part of a gently sloped beach among small boulders underlain by sand (Figure 3). The only other Nova Scotia record of the species' occurrence on a lakeshore habitat, was at Five Island Lake in Halifax County in 1945.

Carolina Redroot (*Lachnanthes caroliana* - S1, At Risk)
We documented this COSEWIC Threatened species (Figure 4) extensively around Ponhook, Molega and surrounding lakes in association with writing the update COSEWIC status report. Our work found many new locations around the known areas of occurrence, especially on Molega Lake, and we domonstrated that the total population was much greater than previously estimated. We also documented it for the first time on First Christopher Lake and Beavertail Lake. All sites where it is known still fall within two populations: 1) Molega and surrounding lakes, and 2) Ponhook and surrounding lakes. Its absence in all other lakes surveyed, including some with suitable habitat very close to known sites, suggests that it is truly highly localized within NS.

Spotted Pondweed (*Potamogeton pulcher* - S1, Undetermined)
There is one historic record of this species (Figure 5) from Lake Erie in Ontario, but otherwise it is known only from Nova Scotia within Canada. In NS, there are 5 historic records from Queens, Lunenburg and Halifax Counties and three other records that are questionable. Our records from

Shingle and Hirtle Lakes thus represent the first well-documented records from anywhere in Canada since 1958.

Michaux's Dwarf Birch (*Betula michauxii* - S2, Sensitive)
Our two records from widely separated shoreline fens on Long Lake were the second inland Nova Scotia records of this Gulf of St. Lawrence endemic species (Figure 6). It is known from a similar habitat on Shingle Lake but is otherwise only known from strongly coastal-influenced bogs in northeast Nova Scotia and Brier Island.

Golden Crest (*Lophiola aurea* - S2, At Risk)
We found three small sites supporting this COSEWIC Threatened species (Figure 7) around Seven Mile Lake, where it had not been previously documented, and we also found new locations at Ponhook and Shingle Lakes. Its absence from other surveyed lakes further demonstrates its rarity in NS.

Mountain Sandwort (*Minuartia groenlandica* - S2, Sensitive)
This subarctic species (Figure 8) is known in Nova Scotia from open rock barrens, almost exclusively on the Atlantic coast. The records from Shingle Lake (where there had been a previous record in 1989) and from Seven Mile Lake are the southermost records known on the Atlantic coast of Nova Scotia and suggest it may be more widespread in inland rock barrens.

Long's Bulrush (*Scirpus longii* - S2, Sensitive)
We found one small population of this COSEWIC Special Concern species (Figure 9) at Russell Lake. Its habitats of open, acidic peatlands (and occasionally lakeshores), is abundant in southern Nova Scotia and more locations, perhaps significantly more than the 15 known occurrences, can be expected to turn up with further fieldwork. The fact that only one new location was found in our extensive fieldwork does indicate, however, that it is not common in the survey area.

Prickly Hornwort (*Ceratophyllum echinatum* - S2?, Not Assessed)
This species was not considered confirmed for Nova Scotia in Zinck (1998). Including this record, it is now known from eight sites around NS, six of which were documented in a taxonomic study by Donald Les (1986).

Philadelphia Panic Grass (*Panicum philadelphicum* - S2S3SE, Sensitive)
This species (Figure 10) was not known from natural habitats in Nova Scotia prior to 2000, and the limited occurrence documented in Roland and Smith (1969) and Zinck (1998) (as *P. tuckermanii*) suggested the possibility that recent records represented expansion from introduced populations. Since 2000 it has been shown to be locally present on seasonally exposed river and lakeshores, at least from Pictou to Yarmouth Counties. Its occurrence in this study on remote sandy beaches where human-assisted introduction would have been unlikely further demonstrates that it is a native species in Nova Scotia that had previously been overlooked.

Meadow Willow (*Salix petiolaris* - S3, Secure)
This species was not known for Nova Scotia in Roland and Smith (1969) but has recently been found to be uncommon but widespread in northern mainland Nova Scotia south to the Windsor area, where it may be expanding its range along logging roads and other disturbed ground. Our record from the Medway River just upstream from Ponhook Lake is the first for southern Nova Scotia and represents a 105km range extension from the next nearest Nova Scotia site. It was locally common in a shrubby rivershore fen where it has likely been present for a long period.

In addition to these generally highly rare species, we found certain rare plants repeatedly at many sites to the point that their status ranks may warrant revision to lower levels of rarity. Table 3 lists six species for which our 2007-2008 records may produce changes in the Nova Scotia S-ranks

administered by the AC CDC, pending review by the Nova Scotia Vascular Plant Ranking Committee.

In summary, our 2007-2008 fieldwork in the Ponhook-Molega Lakes region has significantly increased our understanding of the distribution and status of Nova Scotia's Atlantic Coastal Plain flora through the discovery of new species for the province and the documentation of new locations for provincially rare species. In documenting numerous significant natural areas with data that will be entered permanently into the AC CDC database, our fieldwork has also provided some of the baseline data necessary to justify their conservation.

## References

Roland, A.E. and E.C. Smith. 1969. The Flora of Nova Scotia. Proceedings of the Nova Scotia Institute of Science 26: 5-238, 277-743.

Les, D.H. 1985. Taxonomic significance of plumule morphology in Ceratophyllum (Ceratophyllaceae). Systematic Botany 10: 338-346.

Zinck, M. (ed.). 1998. Roland's Flora of Nova Scotia (2 volumes). Nimbus Publishing and the Nova Scotia Museum, Halifax. 1296 pp.

**Table 1.** Survey sites with dates surveyed and observers. Site numbers correspond to those mapped in Figure 1.

| Site# | Survey Date | Survey Site | Observers |
|---|---|---|---|
| 1 | July 11, 2007 | Mill Cove, Molega Lake | SB, DM, EO, TS |
| 2 | July 11, 2007 | Grassy Point, Ponhook Lake | SB, DM, EO |
| 2a | July 12, 2007 | Medway River, Riversdale to Charleston | SB, DM, EO, JSB |
| 3 | July 12, 2007 | Bay S of Rocksway Island, Molega Lake | SB, JSB |
| 4 | July 12, 2007 | Bay S of Faulkners Pt, Molega Lake | DM, EO |
| 5 | Sept. 2, 2007 | Black Rattle Lake to Beavertail Basin, Molega Lake | SB |
| 6 | Sept. 4, 2007 | Beavertail Basin | SB, TS |
| 7 | Sept. 4, 2007 | SW shore, Molega Lake | SB, TS |
| 8 | Sept. 5, 2007 | Wildcat & Medway Rivers & W end Ponhook Lake | TS |
| 9 | Sept. 6, 2007 | Second Christopher Lake | SB, TS |
| 10 | Sept. 6, 2007 | Beartrap & Cameron Lakes | SB |
| 11 | Sept. 6, 2007 | Uhlman Point to Baker Point, Molega Lake | TS |
| 12 | Sept. 7, 2007 | Beaverdam Lake | SB |
| 13 | Sept. 7, 2007 | Annis Lake | TS |
| 14 | Sept. 8, 2007 | Central Shingle Lake | SB |
| 15 | Sept. 8, 2007 | W end Shingle Lake | TS |
| 16 | Sept. 2-10, 2007 | Black Rattle Lake | SB |
| 17 | August 11, 2008 | Beavertail Lake | SB, DM, JM, PH |
| 18 | August 11, 2008 | Whynot Lake | SB, DM, JM, PH |
| 19 | August 12, 2008 | Elizabeth Lakes | SB, DM, JM |
| 20 | August 12, 2008 | Long Lake | SB, DM, JM |
| 21 | August 13, 2008 | Tupper Lake | SB, DM, JM |
| 22 | August 14, 2008 | Seven Mile Lake | SB, DM, JM |
| 23 | Sept. 11, 2008 | Hirtle Lake | SB, DM, JM |
| 24 | Sept. 12, 2008 | Russell Lake | SB, DM |
| 25 | Sept. 12, 2008 | Third Christopher Lake | SB, DM |
| 26 | Sept. 13, 2008 | First Christopher Lake | SB, DM, MC, BT |
| 27 | Sept. 13, 2008 | Eight Mile Lake | SB, DM, MC, BT |

**Table 2.** Rare species observed, with Nova Scotia status ranks, number of sites recorded and sites where observed. Site numbers correspond to those mapped in Figure 1 and listed in Table 1; "other" = observed incidentally in an area other than the field sites listed in Table 1. In the "ID" column, "x" indicates at least some records of the species require further confirmation of identification. Note that recent taxonomic work has combined the flat-topped goldenrod species *Euthamia caroliniana* and *E. galetorum* under the name *E. tenuifolia*. Both the above species have previously been tracked as S3 or S3S4 ranked species, but in combination under a single species, they are too common in Nova Scotia for tracking. These species were found in almost all lakes visited but are not included in this table.

| ID | Species | Common Name | S-rank | GS Rank | # Sites | Sites Where Observed |
|---|---|---|---|---|---|---|
| | *Alnus serrulata* | Brook-Side Alder | S2 | 3 Sensitive | 14 | 1, 2, 2a, 3, 4, 6, 7, 8, 10, 12, 16, 23, 25, 26 |
| | *Asclepias incarnata* | Swamp Milkweed | S3 | 4 Secure | 7 | 1, 2a, 3, 6, 8, 23, 24 |
| | *Bartonia virginica* | Yellow Screwstem | S3 | 4 Secure | 4 | 21, 22, 23, 27 |
| | *Betula michauxii* | Michaux's Dwarf Birch | S2 | 3 Sensitive | 1 | 20 |
| | *Carex cryptolepis* | Northeastern Sedge | S3? | 4 Secure | 1 | 3 |
| | *Cephalanthus occidentalis* | Common Buttonbush | S2S3 | 3 Sensitive | 15 | 1, 2a, 3, 4, 5, 6, 7, 8, 9, 10, 11, 16, 17, 25, 26 |
| x | *Ceratophyllum echinatum* | Prickly Hornwort | S2? | 6 Not Assessed | 1 | 19 |
| | *Corallorhiza trifida* | Early Coralroot | S3 | 4 Secure | 1 | 2a |
| | *Cyperus dentatus* | Toothed Sedge | S3 | 4 Secure | 9 | 6, 8, 9, 10, 12, 16, 17, 19, 20 |
| | *Decodon verticillatus* | Hairy Swamp Loosestrife | S2S3 | 3 Sensitive | 3 | 13, 25, 27 |
| | *Dichanthelium spretum* | Eaton's Witchgrass | S3S4 | 4 Secure | 21 | 1, 3, 5, 6, 7, 8, 9, 10, 12, 14, 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27 |
| | *Fraxinus nigra* | Black Ash | S3 | 3 Sensitive | 1 | 1 |
| | *Helianthemum canadense* | Canada Frostweed | S1 | 2 May Be At Risk | 1 | 8 |
| | *Hieracium paniculatum* | Panicled Hawkweed | S3 | 4 Secure | 1 | 8 |
| x | *Isoetes acadiensis* | Acadian Quillwort | S3 | 3 Sensitive | 2 | 18, 19 |
| | *Isoetes lacustris* | Lake Quillwort | S3? | 4 Secure | 2 | 6, 22 |
| | *Juncus marginatus* | Grassleaf Rush | S2S3 | 3 Sensitive | 2 | 19, other |
| | *Lachnanthes caroliana* | Carolina Redroot | S1 | 1 At Risk | 11 | 1, 2, 3, 5, 6, 7, 8, 10, 11, 17, 26 |
| | *Lophiola aurea* | Golden Crest | S2 | 1 At Risk | 5 | 2, 8, 14, 15, 22 |
| | *Lycopodiella appressa* | Southern Bog Clubmoss | S3 | 4 Secure | 12 | 1, 6, 8, 9, 10, 11, 14, 21, 22, 23, 25, 27 |
| | *Lycopodium hickeyi* | Hickey's Clubmoss | S2? | 5 Undetermined | 2 | 17, 26 |
| | *Minuartia groenlandica* | Mountain Sandwort | S2 | 3 Sensitive | 2 | 14, 22 |
| | *Myriophyllum humile* | Low Water-Milfoil | S3? | 4 Secure | 8 | 18, 19, 20, 21, 22, 24, 25, 27 |
| x | *Myriophyllum sibiricum* | Common Water-Milfoil | S3S4 | 4 Secure | 1 | 19 |
| x | *Panicum dichotomiflorum var. puritanorum* | Spreading Panic-Grass | S1? | 2 May Be At Risk | 5 | 8, 9, 16, 21, 23 |
| | *Panicum philadelphicum* | Philadelphia Panic Grass | S2S3SE | 3 Sensitive | 5 | 8, 9, 16, 21, 23 |
| | *Panicum rigidulum var. pubescens* | Redtop Panic Grass | S2 | 3 Sensitive | 18 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17, 22, 25, 26, other |
| x | *Platanthera flava var. herbiola* | Pale Green Orchid | S1S2 | 4 Secure | 2 | 2a, 4 |
| | *Polygonum robustius* | Stout Smartweed | S3S4 | 4 Secure | 4 | 21, 22, 24, 25 |
| x | *Polypodium appalachianum* | Appalachian Polypody | S3? | 5 Undetermined | 1 | 19 |
| | *Potamogeton confervoides* | Algae-Like Pondweed | S3S4 | 4 Secure | 15 | 3, 6, 7, 9, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27 |
| | *Potamogeton pulcher* | Spotted Pondweed | S1 | 5 Undetermined | 2 | 14, 23 |

| ID | Species | Common Name | S-rank | GS Rank | # Sites | Sites Where Observed |
|---|---|---|---|---|---|---|
| | *Proserpinaca pectinata* | Comb-Leaved Mermaid-Weed | S3 | 3 Sensitive | 3 | 16, 21, 22 |
| | *Rhexia virginica* | Virginia Meadow-Beauty | S3 | 4 Secure | 18 | 1, 5, 6, 7, 8, 9, 10, 11, 14, 15, 17, 20, 21, 22, 23, 25, 27, other |
| | *Rosa palustris* | Swamp Rose | S3 | 4 Secure | 16 | 1, 2, 4, 8, 12, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27 |
| | *Salix petiolaris* | Meadow Willow | S3 | 4 Secure | 1 | 8 |
| | *Schoenoplectus torreyi* | Torrey's Bulrush | S1 | 6 Not Assessed | 2 | 20, 24 |
| | *Scirpus longii* | Long's Bulrush | S2 | 3 Sensitive | 2 | 2, 24 |
| | *Sisyrinchium angustifolium* | Pointed Blue-Eyed-Grass | S3S4 | 4 Secure | 1 | 1 |
| | *Sisyrinchium atlanticum* | Eastern Blue-Eyed-Grass | S3 | 4 Secure | 10 | 1, 2a, 4, 8, 9, 10, 16, 21, 22, 26 |
| | *Solidago latissimifolia* | Elliott Goldenrod | S3 | 4 Secure | 2 | 24, 27 |
| | *Sparganium fluctuans* | Floating Bur-Reed | S3? | 5 Undetermined | 4 | 21, 22, 24, 27 |
| x | *Symphyotrichum boreale* | Boreal American-Aster | S2? | 3 Sensitive | 1 | 22 |
| | *Symphyotrichum tradescantii* | Tradescant Aster | S3 | 4 Secure | 12 | 1, 2, 2a, 3, 4, 5, 6, 7, 8, 10, 16, 22 |
| | *Symphyotrichum undulatum* | Wavy-leaf American-Aster | S2 | 3 Sensitive | 5 | other (x5) |
| x | *Thalictrum venulosum* | Veined Meadowrue | [S1] | [6 Not Assessed] | 1 | 23 |
| | *Utricularia gibba* | Humped Bladderwort | S2 | 3 Sensitive | 5 | 20, 23, 24, 25, 26 |
| | *Utricularia radiata* | Small Swollen Bladderwort | S3 | 4 Secure | 9 | 3, 15, 18, 20, 21, 22, 24, 25, 27 |
| | *Utricularia resupinata* | Northeastern Bladderwort | S1 | 2 May Be At Risk | 1 | 22 |
| x | *Utricularia subulata* | Zigzag Bladderwort | S3 | 4 Secure | 6 | 9, 10, 15, 17, 19, 21 |

**Table 3.** Rare species for which fieldwork from this project may result in status rank changes, pending review by the Nova Scotia Vascular Plant Ranking Group. In the "ID" column, "x" indicates at least some records of the species require further confirmation of identification.

| Species | Common Name | # Sites | Current Nova Scotia S-rank | Potential Revised Nova Scotia S-rank |
|---|---|---|---|---|
| *Alnus serrulata* | Brook-Side Alder | S2 | S3 | 14 |
| *Cephalanthus occidentalis* | Common Buttonbush | S2S3 | S3 | 15 |
| *Myriophyllum humile* | Low Water-Milfoil | S3? | S4 | 8 |
| *Panicum rigidulum var. pubescens* | Redtop Panic Grass | S2 | S3 | 18 |
| *Potamogeton confervoides* | Algae-Like Pondweed | S3S4 | S4 | 15 |
| *Utricularia gibba* | Humped Bladderwort | S2 | S2S3 | 5 |

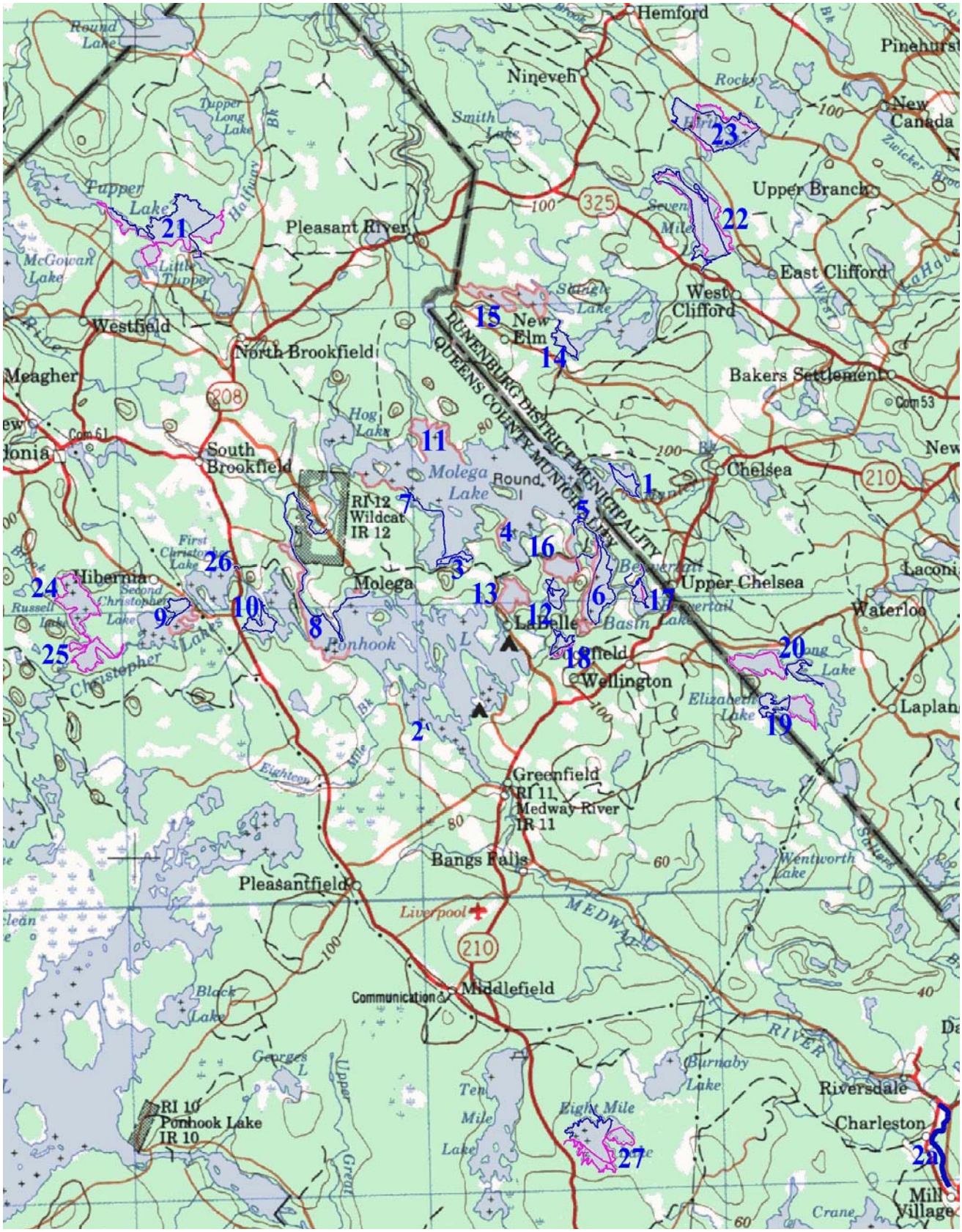


**Figure 1.** Fieldwork locations 2007-2008. Numbers correspond to those in Table 1. Blue and magenta lines are GPS tracks of parties led by Sean Blaney and David Mazerolle. Red lines along shore indicate areas covered by Tyler Smith (and Sean Blaney for #16, Black Rattle Lake) in 2007 (not recorded by GPS). Blue grid boxes are 10km x 10km.

**Figure 2.** Canada Frostweed (*Helianthemum canadense* - S1, provincially Endangered), found on upper lakeshore at Ponhook Lake.

**Figure 3.** Habitat of Canada Frostweed (*Helianthemum canadense* - S1, provincially Endangered) in the transition zone between upper beach and shrubby, open red oak – white pine forest, Ponhook Lake.

**Figure 4.** Redroot (*Lachnanthes caroliniana* - S1, Threatened) in flower at Molega Lake near The Narrows.

**Figure 5.** Spotted Pondweed (*Potamogeton pulcher* - S1, May Be At Risk), found at Hirtle Lake, Lunenburg County. Note the cordate (heart-shaped) base of the broad floating leaves. The project's two records of this species were the first well documented records in Canada since 1958.

**Figure 6.** Michaux's Dwarf Birch (*Betula michauxii* – S2, Sensitive), in a lakeshore fen at Long Lake, Lunenburg County. This was the second inland record for the species in Nova Scotia.

**Figure 7.** Stand of Goldencrest (*Lophiola aurea* – S2, Threatened) at Shingle Lake, Lunenburg County.

**Figure 8.** Greenland Sandwort (*Minuartia groenlandica* – S2, Sensitive), found on lakeshore rock outcrop at Seven Mile Lake, Lunenburg County.

**Figure 9.** Stand of Long's Bulrush (*Scirpus longii* – S2, Special Concern), found in shrub fen at Russell Lake, Queens County. The large plant in the centre of the picture was collected for a specimen and placed in the picture to illustrate the species' large size.

**Figure 10.** Philadelphia Panic Grass (*Panicum philadelphicum, = P. tuckermanii* – S2S3SE, Sensitive), found on sandy beach at Ponhook Lake, Queens County. The occurrence of this species in relatively remote, unaltered sites such as this one strongly suggests that it is native to Nova Scotia but previously overlooked.