

The Status of
Oval-leaved Creeping Spearwort
(*Ranunculus flammula* var. *ovalis*)
in Newfoundland and Labrador



Photo: John E. Maunder

**THE SPECIES STATUS ADVISORY COMMITTEE
REPORT NO. 9**

February 20, 2008

ASSESSMENT

Assessment: Endangered	Current designation: None
Criteria met: B2. Area of occupancy < 500 km ² , a) known to exist at < 5 locations, b) continuing decline observed in iii) area, extent and quality of habitat and C. Number of mature individuals <2,500, 2) continuing decline projected and inferred in numbers of mature individuals, a) fragmentation with i) no population estimated to contain >250 mature individuals,	
Reasons for designation: Qualifies as " <i>endangered</i> " under the SSAC/COSEWIC criteria B2 (a) and (b) iii and C2 (a) i: <ul style="list-style-type: none">• Extent of occurrence and area of occupancy excluding the historical location <0.1 km²• Only 2 recently confirmed locations and 2 to 3 historical locations• Three of the populations, including one historical population, have been subjected to continuing habitat loss and degradation• Restricted to limestone barren habitats that are severely degraded due to anthropogenic effects• Mature individuals estimated to be <500 at recently confirmed locations• Largest confirmed population estimated to be approximately 250 individuals• Rescue effect unlikely	

The original version of this report was prepared by John E. Maunder on behalf of the Species Status Advisory Committee.

STATUS REPORT

Ranunculus flammula Linnaeus var. *ovalis* (J. M. Bigelow) L. D. Benson
Oval-leaved Creeping Spearwort; Fr. renoncule flammette à feuilles ovales

Synonyms:

Ranunculus filiformis Michaux var. *ovalis* J. M. Bigelow
Ranunculus flammula Linnaeus var. *samolifolius* (Greene) Benson
Ranunculus flammula Linnaeus var. *strigulosus* Freyn ex Peck
Ranunculus flammula Linnaeus var. *unalaschcensis* (Besser) Ledebour
Ranunculus reptans Linnaeus var. *erectus* Victorin and Rousseau
Ranunculus reptans Linnaeus var. *ovalis* (J. M. Bigelow) Torrey and A. Gray
Ranunculus reptans Linnaeus var. *samolifolius* Benson
Ranunculus reptans Linnaeus var. *strigulosus* Freyn
Ranunculus samolifolius Greene
Ranunculus unalaschcensis Besser in Ledebour

Family: Ranunculaceae (Buttercups)

Life Form: Herbaceous, perennial, amphibious forb.

Taxonomic Clarifications

The Flora of North America (Whittemore and Parfitt 1997) currently recognizes *Ranunculus flammula* var. *ovalis* as heterogeneous, indicating that more than one taxon maybe included in the name. Checklists by Meades *et al.* (2000) and Kartesz (1994) do not recognize the variety.

Other varieties of *R. flammula* occurring in Newfoundland and Labrador include var. *flammula* (introduced) and var. *reptans*.

A taxonomic entity different from *R. flammula* var. *reptans* does occur in Newfoundland. Specifically, Benson (1942: 305) remarked that “A form [of *Ranunculus flammula* var. *ovalis*] with unusually short, broad, thick radical and cauline leaves occurs in Newfoundland (St. John Bay, *Fernald et al.* 28256, GH; Ingornachoix Bay, *Fernald & Wiegand* 3413, GH.)”.

Many taxonomic uncertainties associated with var. *ovalis*, and its close relatives remain. As Whittemore and Parfitt (1997) have written: “Biosystematic study of *R. flammula* as a whole will be needed for a meaningful treatment of these populations to be possible.”

As *The Flora of North America* (Whittemore and Parfitt 1997) is the most recent comprehensive taxonomic treatment of the genus in North America, it is the one followed in this report.

Distribution

Global:

North America: Canada [see more detail below]. United States of America: several northeastern, northern, and western states, *including* Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Michigan, Minnesota, North Dakota, Wyoming, Nebraska, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Montana (Benson, 1948), Washington, Oregon, California, and Alaska. (Whittemore and Parfitt 1997).

Iceland (Benson, 1948) [doubtful, J.E.M.]

National:

Newfoundland and Labrador (Newfoundland only), Nova Scotia, Prince Edward Island, New Brunswick, Québec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, and Northwest Territories (Whittemore and Parfitt 1997)

Provincial:

Known only from 4 localities on the Great Northern Peninsula of the Island of Newfoundland: Port au Choix, Point Riche, St. John Island and Sandy Cove (Fig. 1).

Benson (1948: 184, 186) included “Labrador” in the range of the variety, without detail. However, this reference seems to be very unlikely, and may refer to “Labrador” in the “old sense” – ie. to the North Shore of the Gulf of St. Lawrence. The distribution of *Ranunculus flammula* var. *ovalis* is generally more southerly than that of the closely-related *Ranunculus flammula* var. *reptans* (Whittemore and Parfitt 1997).

Annotated Range Map

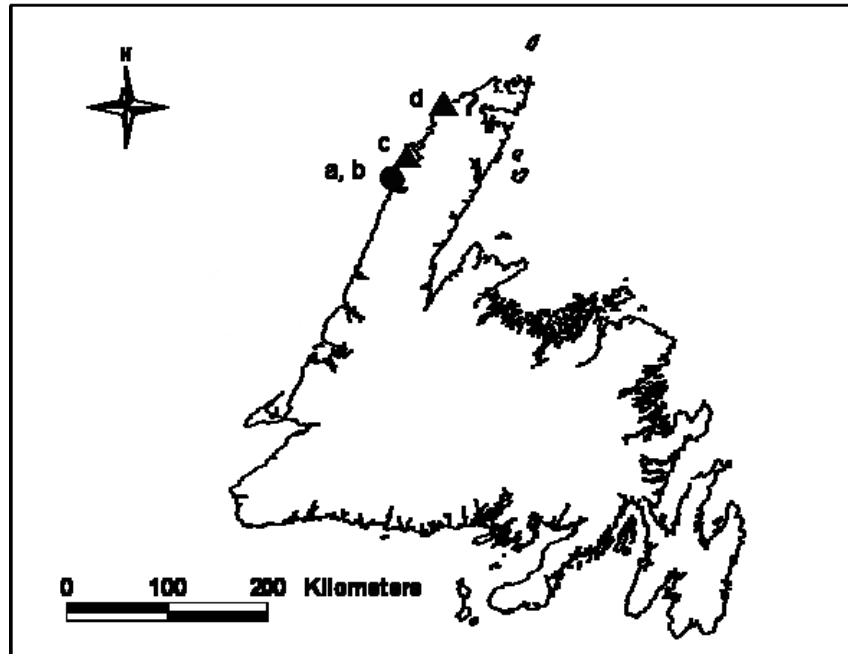


Figure 1. Known localities for *Ranunculus flammula* var. *ovalis* in Newfoundland: [a] Port au Choix (possibly closely equivalent to Fernald's historical "Ingornachoix Bay" locality), [b] Point Riche, [c] St. John Island (historical), [d] Sandy Cove (historical).

Description

A small, amphibious, trailing buttercup. Stems not necessarily rooting at the nodes. Small yellow flowers. Unusually short, broad, thick leaves which are narrow at the base and expanded and pointed towards the tip. Perennial.

Habitat

Generally, "Muddy ground or shallow water, 0-2900 m" (Whittemore and Parfitt 1997).

In Newfoundland, *R. flammula* var. *ovalis* is restricted to intermittent pools on exposed limestone barrens near sea level. More specifically, the habitat of the two most recent collections, as well as of the 3 historical collections, may be described as follows: [1] Port au Choix - within the basin of a small, intermittently flooded patch of drainage-mediated patterned ground over limestone karst

bedrock, between low shrubby heath and highly disturbed, open, limestone gravels; as well as in an adjacent small, shallow, intermittently flooded depression on thin, highly-disturbed (ie. "scraped") limestone gravels over continuous limestone bedrock, [2] Point Riche - open limestone, on fine, slightly-disturbed limestone gravel, probably intermittently flooded; and in a small, very shallow, probably ephemeral pool also containing the rare charophyte *Tolypella glomerata*, [3] Ingornachoix Bay - wet runs and boggy spots in limestone barrens, near sea level, [4] St. John Island - borders of pools and rills in limestone barrens, and [5] Sandy Cove - borders of shallow pools in limestone barrens.

Overview of Biology

In Newfoundland, *R. flammula* var. *ovalis* has been observed to flower in early July. Each var. *ovalis* plant may have roughly 2-4 flowers, each producing about 10-20 achenes. At Wilson's Lake, Nova Scotia, the seed bank for the closely-related *R. flammula* var. *reptans* has been calculated as 162 seeds/m², in lakeshore soil samples (Wisheu and Keddy 1991). An equivalent figure for Newfoundland var. *ovalis* is unknown.

While the closely-related *R. flammula* var. *reptans* is a self-incompatible clonal plant, displaying strong genetic differentiation among populations, at least in Europe (Fischer *et al.* 2000), var. *ovalis* does not necessarily root at the nodes, and, thus, may not rely as much upon vegetative reproduction. *R. flammula* var. *reptans* is apparently insect-pollinated; var. *ovalis* may also be.

In Scotland, *R. flammula* var. *reptans* is known to hybridize freely with var. *flammula*, at zones of contact (Gibbs and Gornell 1976). Whether or not hybridization occurs where *R. flammula* var. *reptans* and var. *ovalis* occur together in Newfoundland is unknown.

Population Size and Area of Occupancy

In Newfoundland, only 4 populations of *R. flammula* var. *ovalis* have yet been recorded: two of these being of historical occurrence (Fig. 1).

Port au Choix population:

Approximate area of occupancy: <200m²
Estimated population of individuals: <250 [rough estimate]

The exact location of Fernald's historical "Ingornachoix Bay" collection is unknown, but it is possibly closely equivalent to the location of the extant Port au Choix population.

Point Riche population:

Known only from [1] a single herbarium collection (originally identified as *Ranunculus reptans*) that was discovered in the herbarium of the Provincial Museum, by John Maunder, on November 1, 2006; and from [2] photographs taken by H. Mann at a small pool in the same immediate vicinity (Maunder (ongoing)). The total aquatic area of the Point Riche pool locality is about 20m² (H. Mann, personal communication, January 2007).

Based upon the subjective field observations of H. Mann, the measured size of the pool, and the apparent density of plants shown in the photos taken, the total number of individual plants in this population size is probably < 250.

The sizes and area of occupancy of the historical St. John Island and Sandy Cove populations, are completely unknown.

Traditional and Local Ecological Knowledge

No published or other evidence has been found regarding the aboriginal use of *R. flammula* var. *ovalis* in Newfoundland. Arnason *et al.* (1981) do not mention the species in their study of eastern Canada ethnobotany.

Trends.

In the 1970's, there was catastrophic gravel-pitting and gravel scraping of the coastal limestone barrens of the Great Northern Peninsula during the upgrading of the Northern Peninsula Highway (Janes 1999). It seems very clear that prior to this road construction period there must have been considerably more suitable habitat available to *R. flammula* var. *ovalis*, throughout the Peninsula. Because of this widespread habitat destruction, the Sandy Cove population has likely been extirpated.

In the Port au Choix-Pointe Riche area, while gross disturbance of the type described has diminished to a great extent, in recent years, there is still much continuing disturbance associated with the closeness of the town of Port au Choix, and with the ongoing activities of that town's inhabitants.

The St. John Island population is probably stable because of its isolation.

Specific population trends are unknown.

Threats and Limiting Factors

The known populations of *R. flammula* var. *ovalis* in the greater Port au Choix-Pointe Riche area are very tiny. Given the history of “gravel scraping” in the area, it seems almost inevitable that the Port au Choix site will eventually become damaged by either random or directed tractor-work. Also, given the general nearness of the town’s commercial operations, it even seems possible that a building might eventually be erected on, or very near, the aforementioned site. Any change in site drainage could alter the growing conditions presently supporting that particular population. On the other hand, the Point Riche site may be secure, since it is now located within the Port au Choix National Historic Park.

The St. John Island population may not be particularly threatened, since there is only limited human activity on the island - that being mainly limited to directed summer fishing activities, and to the associated relatively minor effects of the recreational activities (including limited ATV use) of a few summer residents.

Unless or until the supposed Sandy Cove locality is re-located, no specific comment can be offered; other than to point to the comprehensive general threats presented by human-use of the area (Janes 1999).

Rank or Status

Global	
G-rank	variety not ranked
IUCN	variety not assessed
National	
N-rank	variety not ranked
National General Status	variety not assessed
COSEWIC	variety not assessed
Provincial	
Provincial General Status	variety not assessed
Newfoundland S-rank	variety not ranked
Newfoundland General Status	variety not assessed
Labrador S-rank	variety not ranked
Labrador General Status	variety not assessed
Adjacent Jurisdictions	
Nova Scotia S-Rank	variety not ranked
Nova Scotia General Status	variety not assessed
Prince Edward Island S-Rank	variety not ranked
Prince Edward Island General Status	variety not assessed
New Brunswick S-Rank	S5 (but taxonomic entity uncertain)
New Brunswick General Status	variety not assessed
Québec S-Rank	variety not ranked
Québec General Status	variety not assessed

[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status assessments are based upon the “General Status of Species in Canada (2005)”, and S-Ranks are based upon “NatureServe Explorer”. Where there is apparent discrepancy, NatureServe Explorer ranks are considered to be the least current.]

Existing Protection

The Point Riche locality is within the boundaries of the Port au Choix National Historic Park.

Special Significance

Given Benson’s (1942) remark that the Newfoundland specimens of *R. flammula* var. *ovalis* possessed “unusually short, broad, thick, radical and cauline leaves”

and considering the general uncertainty surrounding the taxonomy of the *R. flammula* complex, our Newfoundland plants could be of significant taxonomic interest.

Sources of Information and List of References

- Anions, M. F. E., 1994. The flora of Gros Morne National Park. Resource description and analysis. Report, Gros Morne National Park, Rocky Harbour, Newfoundland, 143 p. + app.
- Arnason, T., R. J. Hebda, and T. Johns. 1981. Use of plants for food and medicine by native peoples of eastern Canada. *Canadian Journal of Botany* 59: 2189-2325.
- Benson, L. 1942. North American Ranunculi – IV. *Bulletin of the Torrey Botanical Club* 69(4): 298-316.
- Benson, L. 1948. A Treatise on the North American Ranunculi. *American Midland Naturalist* 40(1): 1-261
- Bouchard, A., L. Brouillet, and S. G. Hay. 1993. The rare vascular plants of L'Anse-aux-Meadows National Historic Park. Park Services, Environment Canada. Unpublished report. 41 pp
- Bouchard, A., L. Brouillet, and S. Hay. 1996. Rare vascular plants in Gros Morne National Park, Newfoundland. Report of contract C2242-95-0005, Parks Canada, Hull.
- Bouchard, A., S. G. Hay, Y. Bergeron, and A. Leduc. 1991. The Vascular Flora of Gros Morne National Park, Newfoundland: A habitat classification approach based on floristic, biogeographical and life-form data. Pp. 123-157 in P. L. Nimis and T. J. Crovello (eds.), *Quantitative Approaches to Phytogeography*. Kluwer Academic Publishers, The Netherlands. 280 p.
- Bouchard, A., S. G. Hay, L. Brouillet, and M. Jean. 1992. The rare vascular plants of Port-au-Choix National Historic Park. Parks Service, Environment Canada, Ottawa. Unpublished report. 80 pp.
- Bouchard, A., S. G. Hay, L. Brouillet, M. Jean, and I. Saucier. 1991. The rare vascular plants of the Island of Newfoundland. *Syllogeus* No. 65. Canadian Museum of Nature, Ottawa. 191pp.
- Bouchard, A., S. Hay, L. Brouillet, and P. Turcotte. 1994. The rare vascular plants of the Big Level Plateau, Gros Morne National Park, Newfoundland. Contract K3129-91-136, Parks Service, Environment Canada, Ottawa. 54 pp.

- Bouchard, A., S. Hay, C. Gauvin, and Y. Bergeron. 1985. The rare vascular plants of Gros Morne National Park, Newfoundland, Canada. Parks Canada, Gros Morne National Park, Rocky Harbour, Newfoundland, contract GM83-20, 104 p. + app.
- Bouchard, A., S. Hay, C. Gauvin, and Y. Bergeron. 1986. Rare vascular plants of Gros Morne National Park, Newfoundland, Canada. *Rhodora*, 88 : 481-502.
- Brouillet, J., R. Charest, S. G. Hay, and A. Bouchard. 1997. Floristic analysis of the rare plants of Terra Nova National Park, Newfoundland. Contract #2242-96-0010 for Natural Resources Division, Parks Canada, Hull, Québec.
- Brouillet, L., S. Hay, P. Turcotte, and A. Bouchard. 1998. La flore vasculaire alpine du plateau Big Level, au parc national du Gros Morne, Terre-Neuve. *Géographie physique et Quaternaire* 52: 173-191.
- Fischer, M., R. Husi, D. Prati, M. Peintinger, M. van Kleunen, and B. Schmid. 2000. RAPD variation among and within small and large populations of the rare clonal plant *Ranunculus reptans* (Ranunculaceae). *American Journal of Botany* 87(8): 1128-1137.
- Gibbs, P. E., and R. J. Gornall. 1976. A biosystematic study of the Creeping Spearworts at Loch Leven, Kinross. *New Phytologist* 77: 777-785.
- Hanel, C. 2004. Rare Plant Survey of the Squid Cove Area. Contract Report to the Department of Forest Resources and Agrifoods. Newfoundland and Labrador. Unpublished.
- Hanel, C. 2005. Doctor's Brook Rare Plant Survey. Contract Report to Western Newfoundland Model Forest. Unpublished.
- Hanel, C. 2005. Labrador Straits Botanical Initiative. Unpublished.
- Janes, Hilary. 1999. *Braya longii* (Long's braya), *Braya fernaldii* (Fernald's Braya), and Disturbance on Newfoundland's Great Northern Peninsula. BSc Honours dissertation. Department of Geography, Memorial University of Newfoundland. vi + 44 pp.
- Kartesz, J. T. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. 2nd edition. 2 vols. Timber Press, Portland, OR.
- Maunder, J. E. (ongoing) Ranunculaceae, *in* A Digital Flora of Newfoundland and Labrador Vascular Plants. [website]

http://digitalnaturalhistory.com/flora_ranunculaceae_index.htm (Last accessed February 1, 2007).

Meades, S. J., S. G. Hay, and L. Brouillet. 2000. Annotated checklist of the vascular plants of Newfoundland and Labrador.

<http://digitalnaturalhistory.com/meades.htm> (Last accessed October 13, 2007)

Mitchell, R. S., and J. K. Dean. 1982. Ranunculaceae (Crowfoot Family) of New York State. Contributions to a Flora of New York State IV. New York State Museum. Bulletin No. 446. 100 pp.

NatureServe Explorer: An online encyclopedia of life [website]. Arlington, Virginia.

<http://www.natureserve.org/explorer> (Last accessed October 13, 2007).

Newfoundland Rare Plant Project. [website]

<http://www.digitalnaturalhistory.com/naturalhistoryrareplant.htm> (Last accessed October 13, 2007).

Scott, P. J. 2004 [and onward] Flora of Newfoundland and Labrador.

<http://www.mun.ca/biology/delta/nflora/nlf/www/rarnfo.htm> (Last accessed October 13, 2007)]

Stace, C. 1997. New Flora of the British Isles. Second Edition. Cambridge University Press. xvii + 1130 pp.

Whittemore, A. T. and B. D. Parfitt. 1997. Ranunculaceae, *in* Flora of North America. Vol. 3. Oxford University Press. New York. Oxford. [Online version at:

http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=127971 (Last accessed October 13, 2007)]

Wild Species 2005: The General Status of Species in Canada. 2005. General Status Search Tool. [website]

<http://www.wildspecies.ca/wildspecies2005/search.cfm?lang=e&sec=9> (Last accessed October 13, 2007).

Wisheu, I. C., and P. A. Keddy. 1991. Seed banks of a rare wetland plant community: distribution patterns and effects of human-induced disturbance. *Journal of Vegetation Science* 2: 181-188.

Collections Examined

Provincial Museum of Newfoundland and Labrador:
Two herbarium collections.

TECHNICAL SUMMARY

Distribution and Population Information	Criteria Assessment
<i>Extent of occurrence (EO)(km²) [excluding historical populations]</i>	0.02 km ² [estimate excluding historical populations]
<i>Area of occupancy (AO) (km²) [excluding historical populations]</i>	0.00022 km ² [estimate excluding historical populations]
<i>Number of extant locations</i>	2 recent locations; 2-3 additional historical locations (at least one of which probably still exists)
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	unknown
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	unknown; 3 of the known locations (including one which is historical) have been subject to habitat loss and degradation
<i>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</i>	unknown; perennial
<i>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</i>	< 500 [estimate]
<i>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	Unknown
<i>Are there extreme fluctuations (>1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	Unknown
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	yes
Rescue Effect (immigration from an outside source)	
<i>Does species exist elsewhere? [adjacent provinces only]</i>	yes
<i>Status of the outside population(s)?</i>	unknown
<i>Is immigration known or possible?</i>	unlikely
<i>Would immigrants be adapted to survive here?</i>	unknown
<i>Is there sufficient habitat for immigrants here?</i>	unknown

Appendix A. Population Information

Recently Verified Occurrences/Range Use (recorded within the last 25 years)

Verified occurrences consist of observations supported by the collection of a voucher specimen (i.e. a sample to be identified/confirmed by experts and deposited in a herbarium).

Port au Choix :

July 10, 2001. Gargamelle. Small area of unaltered, water-drainage-mediated, patterned ground, within highly-disturbed limestone gravels, near edge of tuckamore. [Observer: John E. Maunder. Collection: NFM 7299 (Provincial Museum of Newfoundland and Labrador).]

Point Riche :

June 1998. Pointe Riche Peninsula. Northeast of lighthouse on exposed limestone barrens. In a small, very shallow pool (less than 10 cm deep), also containing the rare charophyte *Tolypella glomerata*. Pool no doubt ephemeral, at least in some years and seasons, with an aquatic area of only about 20 square meters. [Observer: H. Mann. Collection: no collection; but, diagnostic photos taken (see Figures B-2a, B-2b).]

July 31, 1999. Pointe Riche Peninsula. Barren of fine limestone gravel which seems slightly disturbed. [Observers: R. Charest, Claudia Hanel, N. Djan-Chékar. Collection: NDC 99-73 = NFM 4573 (Provincial Museum of Newfoundland and Labrador).]

Recent Search Effort (areas searched within the last 25 years with estimate of effort)

General rare plant surveys of the west and northeast coasts of the Island were conducted by members of the Newfoundland Rare Plant Project (*q.v.*), specifically during 1999 to 2001, when 1645 individual sites were surveyed and 7622 plant collections were made. Specific attention was paid to the Port au Choix-Pointe Riche area and St. John Island. Additional general rare plant surveys have been conducted within the Province by various National Parks personnel, and by J. E. Maunder of the Provincial Museum and H. Mann of Sir Wilfred Grenfell College (early 1970's to present), as well as by N. Djan-Chékar of the Provincial Museum (2002 to present). Significant additional general collecting has been conducted, on the south coast of the Island, by R. Etcheberry, of St.-Pierre et Miquelon (1986, 1987, 1989, 1990, 1992, and 1993).

Targeted rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of the publication “The Rare Vascular Plants of the Island of Newfoundland” (Bouchard *et al.* 1991), in: 1984 and 1985 (Gros Morne National Park), 1986 (southwest coast, and the general Port au Port area), 1987 (Great Northern Peninsula), 1988 (Baie Verte Peninsula, Notre Dame Bay, and central and eastern Newfoundland), 1989 (Gros Morne National Park, and the south coast), and 1990 (west coast, and Great Northern Peninsula).

Geographically focused rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of contracted rare plant reports for Port au Choix National Historic Park (Bouchard *et al.* 1993), L’Anse aux Meadows National Historic Park (Bouchard *et al.* 1993), Gros Morne National Park (Anions, 1994; Bouchard *et al.*, 1985, 1986, 1991, 1994, 1996; and Brouillet *et al.*, 1998), and Terra Nova National Park (Brouillet *et al.* 1997). Additional geographically focused rare plant surveys were conducted in the Squid Cove and Doctors Brook areas, and the Labrador Straits region by C. Hanel (2004, 2005a, 2005b).

As well, on the west coast of the Island, B. Hellquist and G. Crow surveyed for aquatic species in 1986.

However, targeted searches in search of additional occurrences of *Ranunculus flammula* var. *ovalis* have not yet been undertaken.

Historical Verified Occurrences/Range Use (recorded prior to the last 25 years)

August 4, 1910. Ingornachoix Bay. Wet runs and boggy spots in limestone barrens, near sea level. Flower and fruit. [Location probably very close to the recent Port au Choix occurrence.] [Observers: M. L. Fernald, K. M. Wiegand and J. Kittredge, Jr. Collection: 3413 = GH 265300 (Gray Herbarium).]

July 31, 1925. St. John Island. Borders of pools and rills in limestone barrens. Flower and fruit. [Observers: M. L. Fernald, K. M. Wiegand, B. H. Long, F. A. Gilbert, Jr. and N. Hotchkiss. Collection: 28256 = GH 265306 (Gray Herbarium).]

July 25, 1925. Sandy (or Poverty) Cove. Borders of shallow pools in limestone barrens. Flower and fruit. [Observers: M. L. Fernald, B. H. Long & F. A. Gilbert, Jr. Collection: 28254 = GH 265304 (Gray Herbarium).] Not mentioned by Benson (1942: 305). However, Walter Kittredge, Senior Curatorial Assistant, Harvard University Herbaria (which houses the Gray Herbarium), wrote to John E. Maunder in early 2007, stating that: “The Fernald *et al.* 28254 specimen does look like the St. John and Ingornachoix Bay specimens.”

Potential Sites Unexplored

Focused searches of intermittently-wet depressions and pools, almost anywhere on the northwest coast limestone barrens may possibly locate additional *Ranunculus flammula* var. *ovalis* populations. The taxon is easily mistaken for the similar, and relatively common, *Ranunculus flammula* var. *reptans*, and so may have been overlooked, even in areas well-explored.

Appendix B. Supplementary Details

Taxonomic Clarifications

The Flora of North America currently recognizes three varieties of *Ranunculus flammula* (Whittemore and Parfitt 1997).

[The assignment of these three taxonomic entities to “variety” status, as opposed to “subspecies” or “species” status, is simply a product of the particular taxonomic history and literature of the family Ranunculaceae in North America. In Europe, where var. *ovalis* apparently does not occur, var. *flammula* and var. *reptans*, are typically raised to species status (Stace 1997).]

The three North American varieties, all of which occur in Newfoundland, can be characterized, in the simplest sense, as follows:

var. *flammula* Linnaeus - medium-size; more-or-less erect; often somewhat bushy; lanceolate basal leaves; medium-sized flowers with wide petals [Introduced in our region, to the St. John’s area]

var. *ovalis* (J. M. Bigelow) L. D. Benson – small-size; trailing; relatively slender; lance-*oval* basal leaves; medium-to-small-sized flowers with medium-wide petals

var. *reptans* (Linnaeus) E. Meyer – small-size; trailing; slender; filiform or very narrowly lanceolate basal leaves; small-sized flowers with generally narrow petals

That said, Whittemore and Parfitt (1997) remarked that: “*Ranunculus flammula* var. *ovalis*, as currently understood, is heterogeneous. Many specimens from throughout the cited range scarcely differ from specimens of *R. flammula* var. *reptans* and perhaps should be included in the latter variety.”

Contrarily, it would seem that much, or even most, of the supposed, abovementioned “heterogeneity” is the result of a widespread general confusion concerning the distinguishing features of the three described varieties, and the considerable variation which occurs within each.

Benson (1942, 1948) analyzed the varieties of *Ranunculus flammula*. With regard to var. *ovalis*, he indicated: [1] that the variety is best represented by broader-leaved populations in the western United States, along with similar, somewhat scattered populations ranging eastward into eastern Canada; and [2] that narrower-leaved populations from New England and New York seem to be “intermediate” between var. *ovalis* and var. *reptans*. [For a good illustration of the

“intermediate” narrower-leaved form from the New York area, see Mitchell and Dean (1982: 40).]

However, upon closer inspection, the distribution of the broader-leaved, primarily western form, seems to both overlay and bracket the distribution of the supposedly “intermediate”, narrower-leaved, primarily eastern form.

It may be that Benson’s narrower-leaved form is actually a distinct entity (ie. “true var. *ovalis*”) - as opposed to just a nebulous “intermediate” form - while the primarily western, broader-leaved form is actually something entirely different? Perhaps significantly, the broader-leaved, primarily western form was, for a time, recognized separately, as var. *strigulosus* (Benson 1942, 1948). If molecular studies eventually reveal that the narrower-leaved eastern form is indeed distinct from the broader-leaved primarily western form, then the broader-leaved form will require a new name [perhaps, again, “var. *strigulosus*”?] since the type specimen of var. *ovalis* [now lost] was from the Boston area, and apparently represented the narrower-leaved form.

However, of great pertinence to the present discussion is Benson’s (1942: 305) remark that “A form [of *Ranunculus flammula* var. *ovalis*] with unusually short, broad, thick radical and cauline leaves occurs in Newfoundland (St. John Bay, *Fernald et al.* 28256, GH; Ingornachoix Bay, *Fernald & Wiegand* 3413, GH.)” Eighty years after Fernald’s initial collections, this noteworthy “Newfoundland form” (the subject of this report) has still been found only in a very small, restricted area of exposed limestone barrens habitat in the vicinity of Port au Choix, and on nearby St. John Island (and, possibly also, at Sandy Cove). The possibility that these somewhat “unusual”, semi-succulent plants, growing in intermittent pools, on exposed limestone substrate, within a very restricted range, might actually represent a *new, as yet undescribed*, distinct form (whether worthy of varietal status, or not) should be actively considered.

There is still one additional source of taxonomic confusion. In some regions, the closely-related *Ranunculus flammula* var. *reptans* may exhibit *narrow*, “long-handled-spoon-shaped” *cauline* leaves, that are somewhat broader than is generally thought typical of the variety. In Newfoundland, such plants seem to become more common towards the north. While not nearly broad-leaved enough to qualify as var. *ovalis* (particularly the “unusual” Newfoundland form), these plants do sometimes *tend* toward that variety. However, when all significant characters are considered, the available Newfoundland var. *ovalis* material is quite clearly distinct from even the most broad-leaved variations of var. *reptans* [see the comparison table presented in the “Description” section, below].

All of the variation described above may, of course, be additionally amplified by the particularly significant phenotypic responses to varying climate, exposure,

substrate, and patterns of submersion, that are typical of the family Ranunculaceae.

Clearly, as Whittemore and Parfitt (1997) have written: “Biosystematic study of *R. flammula* as a whole will be needed for a meaningful treatment of these populations to be possible.”

In light of the many continuing taxonomic uncertainties associated with var. *ovalis* and its close relatives, all of the global and national distributions, and conservation status data, presented in this report, should be viewed with some caution.

Description (Fig. B-1 and B-2)

Perennial amphibious herbs. **Stems** 10-45 cm long, mostly 0.8-1.5 mm in diameter, prostrate, not necessarily rooting at nodes. **Basal leaves** markedly broader than the petioles, 10-50 mm long, 1.5-7 mm broad, lance-elliptic, broadest at the middle, tapering at both ends, entire, glabrous, somewhat succulent [at least in Newfoundland]; petioles 2-6 mm long. **Cauline leaves** borne singly at the nodes [at least in Newfoundland], blades oblanceolate or broadest at the middle or rarely ovate, 10-20 mm long, 1.4-4 mm broad, becoming much smaller distally, petioled or rarely sessile, the bases sheathing the stem, somewhat succulent [at least in Newfoundland]. Usually flowering from one or two branches at each rooted node, but sometimes several-flowered apically. **Petals** 5, commonly 3.5-5 mm long, 2-3 mm broad. Intermediate in quantitative characters between *R. flammula* var. *flammula* and var. *reptans*. (Adapted from Benson 1942, 1948; Scott 2004; Whittemore and Parfitt 1997, with additions).

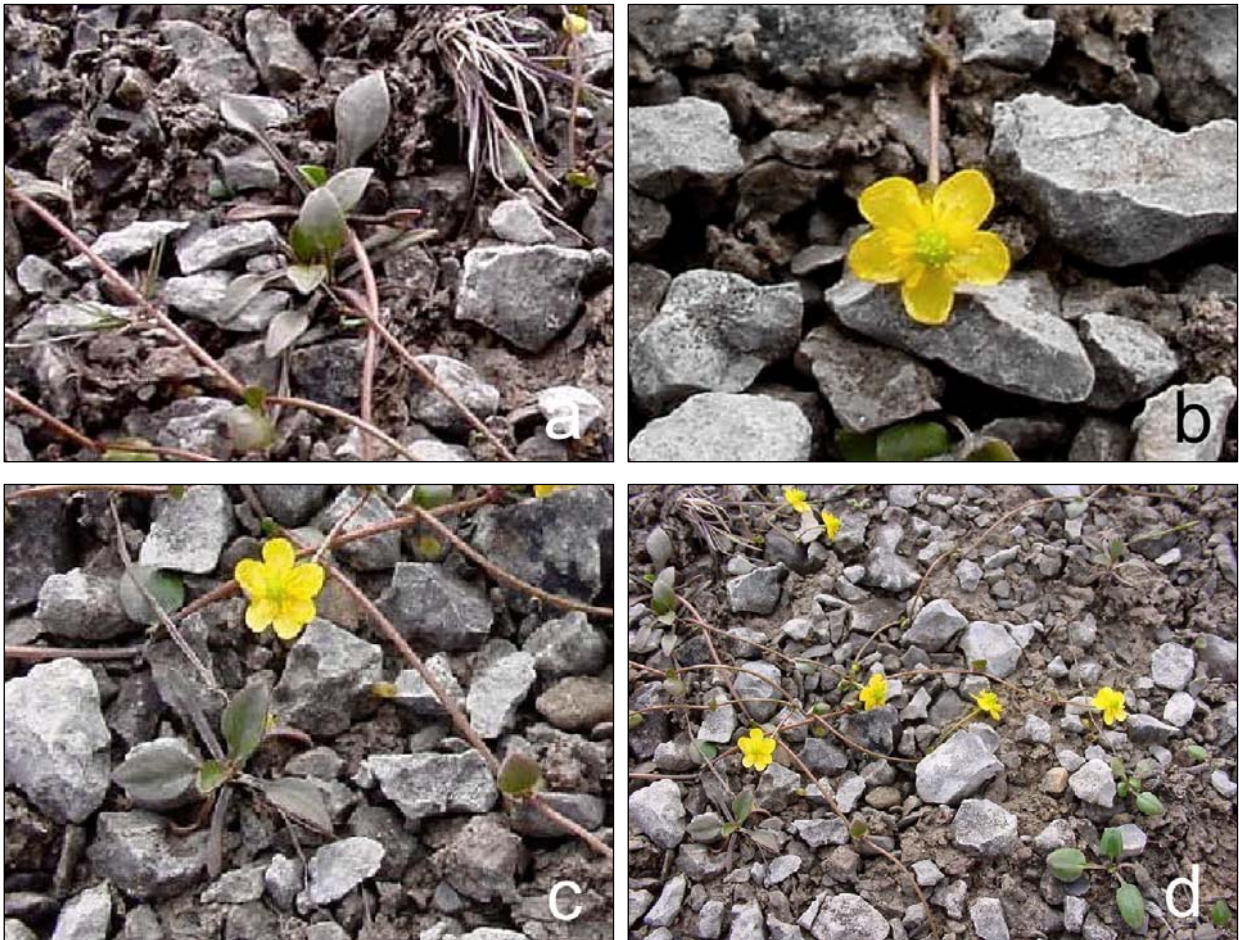
Despite the many, daunting, taxonomic points raised earlier above, it is possible to make a clear distinction between *R. flammula* var. *ovalis* and var. *reptans* [the introduced, very distinct var. *flammula* not being an issue here]:

Stem: **var. ovalis**: not necessarily rooting at the nodes, mostly 0.8-1.5 mm in diameter. **var. reptans**: rooting at practically every node, mostly 0.2-1.0 mm in diameter.

Basal leaves: **var. ovalis**: markedly broader than the petioles; broadest in the middle of the blade, tapering at both ends; 10-50 mm long, 1.5-7 mm broad; glabrous, somewhat succulent [at least in Newfoundland]. **var. reptans**: simple, filiform or linear, not or barely expanded into a blade; 15-60(90) mm long, 0.5-1.5 mm broad; glabrous or with appressed hairs 2-8 mm long; not particularly succulent.

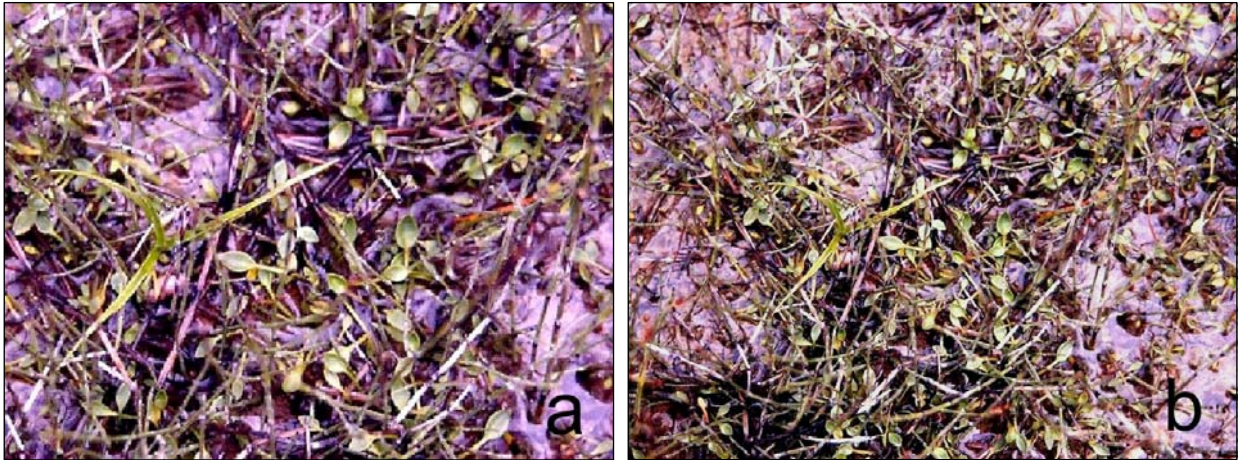
Cauline leaves: **var. ovalis**: borne more or less singly (or very few) at the nodes [at least in Newfoundland], blade oblanceolate or broadest in the middle or rarely ovate; 10-20 (30) mm long; 1.5-4 mm broad; becoming *much* smaller distally [at least in Newfoundland], petioled or rarely sessile; somewhat succulent [at least in Newfoundland]. **var. reptans**: clustered at the nodes, blades usually somewhat expanded, often narrowly long-handled-spoon-shaped; to 30 mm long, 1-1.5 mm broad; becoming only slightly smaller distally; not particularly succulent.

Petals: **var. ovalis**: 5; relatively broad, nearly touching; 3.5-5 mm long, (2)3.5 mm wide. **var. reptans**: 5 *plus* (sometimes as many as 11); relatively narrow, not at all touching; 2-4(7) mm long, 1.3-2.5(3.5) mm wide.



Photos: John E. Maunder

Figure B-1. Description (variety *ovalis* from the Port au Choix locality): [a] basal leaves, [b] broad-petaled flower, [c] flower, basal leaves, cauline leaf, [d] whole plant



Photos: Henry Mann

Figure B-2. Description (variety *ovalis* from the Point Riche locality): [a] basal leaves, [b] same, longer view. Note the longer petioles on these more aquatic examples.

Habitat (Fig. B-3 and B-4)



Photos: John E. Maunder

Figure B-3. Habitat (at Port au Choix locality): [a] small, shallow, intermittently flooded depression on thin, highly-disturbed limestone gravel over continuous limestone bedrock, [b] the basin of a small, intermittently flooded patch of drainage-mediated patterned ground over limestone karst bedrock, [c] closeup of the patterned ground, [d] the same, flooded.



Photo: Henry Mann

Figure B-4. Habitat (Point Riche locality): A small, very shallow pool (less than 10 cm deep) also containing the rare charophyte *Tolypella glomerata*. Pool no doubt ephemeral in some years and seasons, with an aquatic area of only about 20 square meters.

Collections Examined

Provincial Museum of Newfoundland and Labrador:

NFM 4573, NFM 7299 [see Appendix A for details].