

The Status of
Alaska Rein Orchid
(*Platanthera foetida*)

in Newfoundland and Labrador



Photo: John E. Maunder

**THE SPECIES STATUS ADVISORY COMMITTEE
REPORT NO. 14**

February 20, 2008

ASSESSMENT

Assessment: Endangered	Current designation: None
Criteria met: D1. Number of mature individuals <250	
Reasons for designation: Qualifies as " <i>endangered</i> " under the SSAC/COSEWIC criteria D1 <ul style="list-style-type: none">• Only one known population• Number of mature individuals < 55• Extremely restricted, extent of occurrence and area of occupancy < 0.1 km²• Desirable species, hence poaching is a severe threat• 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

Platanthera foetida Geyer ex Hooker
Alaska Rein Orchid. Fr. orchis d'Unalaska

Etymology:

“rein” = From Latin: “habena” (hence *Habenaria*) = “the reins of a horse”, apparently referring to the long, narrow flower parts of this group.

Synonyms:

Spiranthes unalascensis Sprengel
Habenaria foetida (Geyer ex Hooker) S. Watson
Habenaria schischmareffiana Chamisso
Habenaria unalascensis (Sprengel) S. Watson
Herminium unalaskense (Sprengel) Reichenbach
Piperia unalascensis (Sprengel) Rydberg
Piperia unalascensis (Sprengel) Rydberg [spelling as in Flora of North America]
Platanthera unalascensis (Sprengel) Kurtz

[The Flora of North America treatment for this taxon (Ackerman and Morgan 2003) is obsolete, in that it continues to employ the widely-used name *Piperia unalascensis*.]

Family: Orchidaceae (Orchids)

Life Form: Herbaceous, perennial forb.

Distribution

Global:

North America: Canada [see more detail below]. United States of America: several western states, including South Dakota, Colorado, Wyoming, Montana, New Mexico, Idaho, Utah, Nevada, Washington, Oregon, California, and Alaska; with a disjunct eastern outlier in Michigan (Ackerman and Morgan 2003)

National:

Newfoundland and Labrador (Newfoundland only), Québec, Ontario, Alberta, and British Columbia (Ackerman and Morgan 2003).

[The Newfoundland, Québec, and Ontario populations are disjunct, and very restricted.]

Provincial:

Within the Province of Newfoundland and Labrador, known only from one very small locality near Port au Choix (Fig. 1).

Annotated Range Map

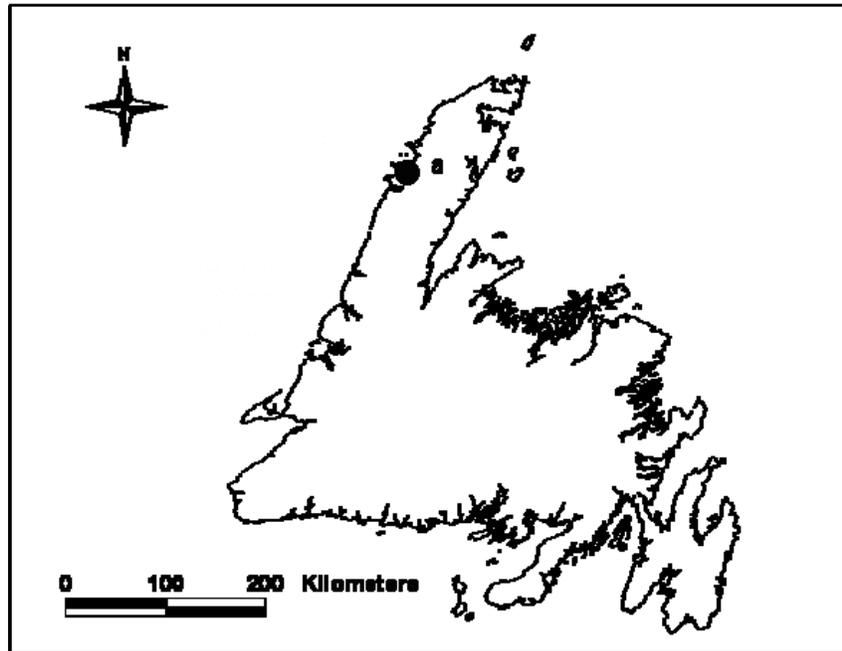


Figure 1. Known locality for *Platanthera foetida* in Newfoundland.

Description

Very slender, white-flowered, perennial orchid, of the “rein orchid type”. Inconspicuous outside of the flowering period.

Habitat

Coniferous and mixed evergreen forests, generally dry sites, rarely coastal bluffs; 0-3000 m (Ackerman and Morgan 2003).

In Newfoundland (very unlike in the west): larch (*Larix laricina*) shrub swamp with low (3 to 5 m tall) black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*);

relatively open with dense shrub layer, scattered herb layer and complete moss cover dominated by the moss species *Pleurozium schreberi*, *Ptilium crista-castrensis* and *Rhytidiadelphus triquetrus*; wet organic soil; partial shade. Also, in thick moss in areas dominated by water horsetail (*Equisetum fluviatile*), where there is less *Larix* sp. but more *Abies* sp.

Overview of Biology

Perennial. Tuberous. Seeds require a mycorrhizal fungus association in order to germinate. Seeds develop into protocorms which remain underground for 2-4 years before sending up leafy shoots. As is typical of many orchids (Kindlmann and Balounová, 2001; Rasmussen, 1995; Wells, 1981), only a portion of tubers send up flowering stems in any given year (percentage unknown for *P. foetida*). Indeed, tubers can remain dormant for 1-4 years before re-emerging (Rasmussen, 1995). Of those tubers which do leaf out in any given year, only a portion (percentage unknown for *P. foetida*) will also actually flower in that year. In a study of *Piperia yadonii* in California, the *highest* recorded portion of leafy plants flowering was 22% (Doak and Graff, 2001). Typically, both the percentage of tubers sending up leafy shoots, and the percentage of leafy shoots flowering, can fluctuate wildly from year to year. In Newfoundland, flowers develop by early August. Newfoundland plants appear to produce good fruit, but there is not enough information available to comment definitively on overall seed production.

Population Size and Area of Occupancy

Very small population. Plants tend to be scattered, and patchily distributed. Since not all plants send up visible flowering stems each year, the actual total number of plants extant is almost certainly greater than is indicated by observable individuals.

A maximum count of 40 flowering stems was recorded, within the main occurrence, during a careful survey in 2000. However, a much lower count of 4 flowering stems was recorded in the same area, during a similar careful search in 2003. Two somewhat more cursory surveys in 2006 suggested a maximum count that would have been in the upper end of this range.

The main area of occurrence runs for about 100 m near a winter ATV track, and is probably < 25 m wide. Individual flowering stems are very intermittently distributed within this small area.

A very small, outlying site (ie. the original 1996 discovery site) probably contains <10 flowering stems (plants were “scattered” over a “linear” area of “±10 m.”; e-mail from L. Johnson to N. Djan-Chékar, December 15, 1999). However, since

the location of this second occurrence is not known with precision, and since the site has apparently not yet been relocated by local observers, this conclusion is approximate. A second, very small, outlying occurrence site, much nearer to the main highway, probably contains <5 flowering stems.

Given that a minimum of 4 flowering stems, and a maximum of 40 flowering stems, have so far been recorded, in different field searches at the Eddies Cove West locality, in different years, it is proposed that the actual number of plants extant (dormant, plus leafy, plus flowering) may well be as high as 200 or more based on percentages observed for *Piperia yadonii* in California (Doak and Graff 2001).

Traditional and Local Ecological Knowledge

No published or other evidence has been found regarding the aboriginal use of *Platanthera foetida* in Newfoundland. In particular, Arnason *et al.* (1981) failed to mention the species in their comprehensive study of eastern Canada ethnobotany.

Trends

Unknown. First collected in the Province by Larry Johnson in 1996 (Meades *et al.* 2000). This remains the only site known.

Threats and Limiting Factors

At present, no known specific threats, except, possibly, for collecting by orchid hunters, either for personal cultivation or for sale. Collecting for research/museum purposes needs to remain very judicious. While the exact location of the single population area is, so far, unknown to the general orchid hunting population, the area will inevitably be found.

Existing Protection

None.

Special Significance

A western North American Cordilleran species; disjunct in the east.

Rank or Status

Global	
G-rank	G5
IUCN	not assessed
National	
N-rank	NNR (not ranked)
National General Status	4
COSEWIC	not assessed
Provincial	
Provincial General Status	2
Newfoundland S-rank	S1
Newfoundland General Status	2
Labrador S-rank	not present
Labrador General Status	not present
Adjacent Jurisdictions	
Nova Scotia S-Rank	not present
Nova Scotia General Status	not present
Prince Edward Island S-Rank	not present
Prince Edward Island General Status	not present
New Brunswick S-Rank	not present
New Brunswick General Status	not present
Québec S-Rank	S1
Québec General Status	2

[NatureServe Explorer, and the General Status of Species in Canada (2005) follow Kartesz (1994) in using the name *Piperia unalascensis*. However, *Platanthera foetida* is now the generally accepted name (Bateman *et al.* 2003).]

[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status ranks 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.]

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Collections Examined

Provincial Museum of Newfoundland and Labrador.
One herbarium specimen.

Agriculture and Agrifood Canada Herbarium (DAO)
Larry Johnson herbarium collection, examined via digital image from DAO

TECHNICAL SUMMARY

Distribution and Population Information	Criteria Assessment
<i>Extent of occurrence (EO)(km²)</i>	0.072 km ²
<i>Area of occupancy (AO) (km²)</i>	0.0025 km ²
<i>Number of extant locations</i>	1
<i>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</i>	unknown; first verified for the Province in 1996.
<i>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</i>	unknown; first verified for the Province in 1996.
<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>	maximum recorded count of <55 flowering stems; actual number of plants extant is almost certainly higher - probably 200 or more
<i>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</i>	unknown; first verified for the Province in 1996.
<i>Are there extreme fluctuations (>1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</i>	unknown; the percentage of flowering stems versus dormant tubers/leafy stems can vary greatly from year to year
<i>Is the total population severely fragmented (most individuals found within small and isolated populations)</i>	only one Newfoundland population known
Rescue Effect (immigration from an outside source)	
<i>Does species exist elsewhere?</i>	Yes
<i>Status of the outside population(s)? [adjacent Provinces only]</i>	Québec, may be at risk
<i>Is immigration known or possible?</i>	unknown
<i>Would immigrants be adapted to survive here?</i>	unknown
<i>Is there sufficient habitat for immigrants here?</i>	unknown

Appendix A. Population Information

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. 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).

Targeted surveys for *Platanthera foetida* have been carried out at the Eddies Cove West site, on at least 4 occasions, since its discovery there in 1996.

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

None.

Other Observations (unverified occurrences)

None.

Potential Sites Unexplored

The wet shrub swamp areas of western Newfoundland have been only lightly searched. However, in the author's experience, the particular combination of habitat characteristics found at the current occupied site appear to be very rare, perhaps even unique, within the Province.

Appendix B. Supplementary Details

Taxonomic Clarifications

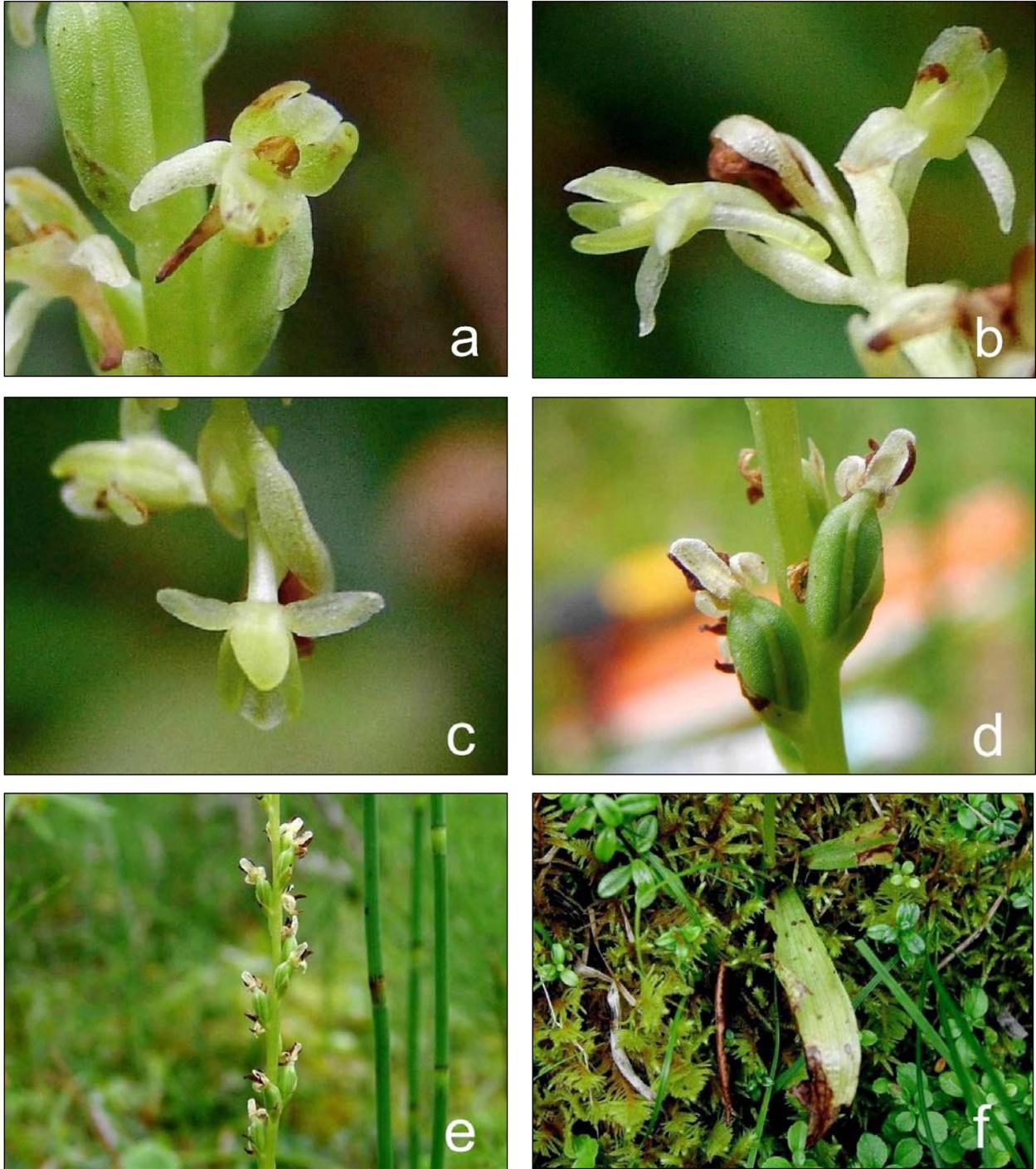
Ackerman (1977) argued that *Piperia* should be kept separate from the similar genus *Platanthera* on the basis of several morphological features: ovoid vs. fusiform tubers, leaves withering before or during flowering, caudicles [the stalks by which the *pollinia* are attached to the base of the *viscidium*] very short and inconspicuous, and auricles at the base of the anthers absent. Healey *et al.* (1980) found additionally that the seed coats of several species of *Piperia* were transversely reticulate, while those of *Platanthera* were smooth.

The Flora of North America treatment for this taxon (Ackerman and Morgan 2003) continues to employ the widely-used name *Piperia unalascensis*. Nonetheless, in a recent study, Bateman *et al.* (2003) employed extensive molecular analysis to demonstrate that *Piperia* is "nested well within *Platanthera s.l.*", as "a tight monophyletic group" [ie. section *Piperia*], albeit separated from other sections within *Platanthera (sensu lato)* by the morphological characters already noted by Ackerman (1977). This molecular analysis, and its taxonomic implications, have now been generally accepted.

A molecular and morphological study of "section *Piperia*" in North America is presently being conducted by Robert Lauri, Rancho Santa Ana Botanic Garden/Pomona College, California. Preliminary results from this study suggest that "there is very little supported branching structure within *Platanthera foetida*" and that "the samples from Newfoundland don't separate out from" samples from elsewhere in North America (R. Lauri, personal communication, August 29, 2007).

Description (Fig. B-1)

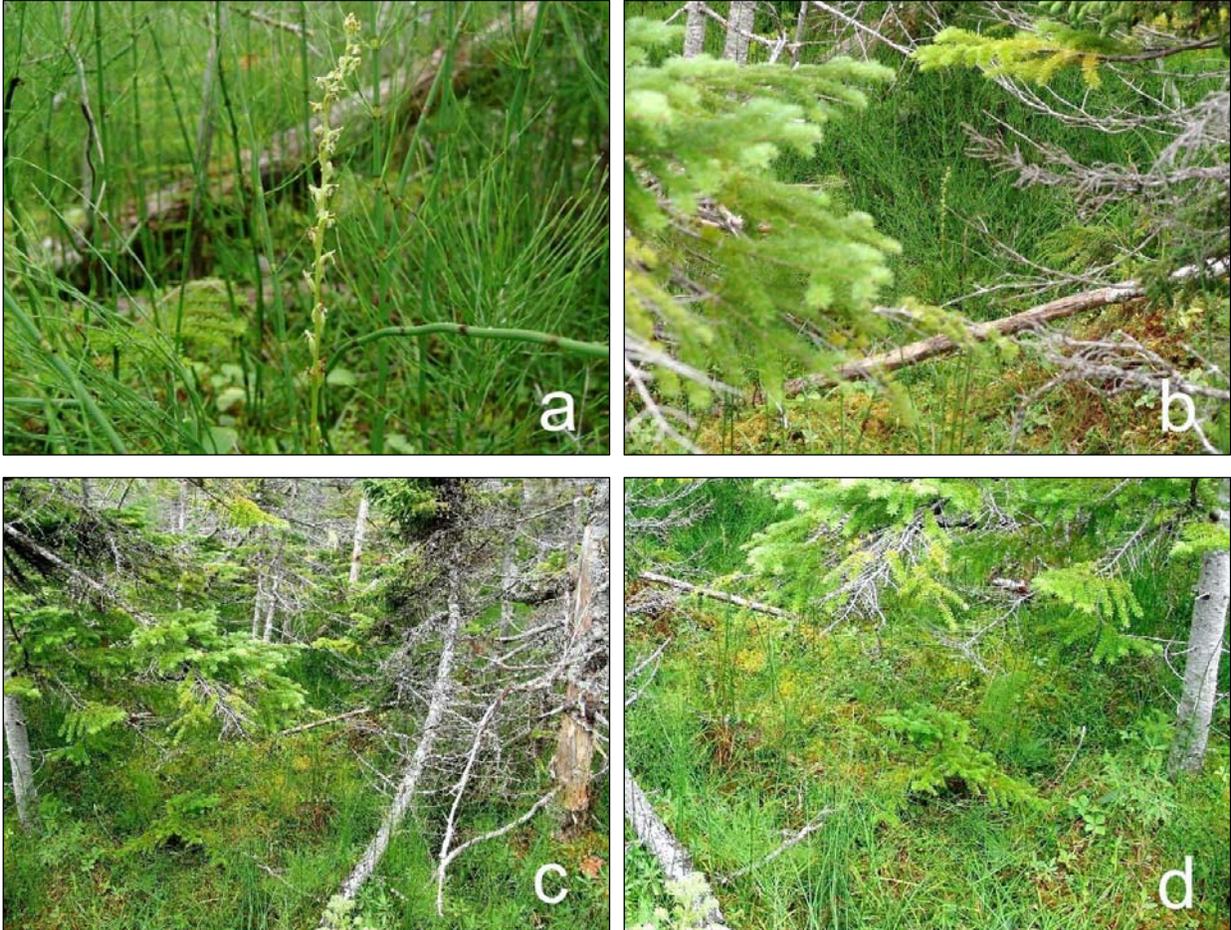
Slender perennial herb. Inconspicuous outside of flowering time. **Plants** 9–70 cm tall. **Stems** swollen towards base, 0.7–6.1 mm diameter distal to leaves; bracts 1–8. **Leaves** prostrate; blade 5–16(20) × 1.3–3.5 cm. **Inflorescences** usually sparsely flowered, 3–44 cm; rachis usually longer than peduncle; bracts 3–23 mm. **Flowers** ± translucent green, fragrance nocturnal but lingering during day, musky or soapy, sometimes honeylike; sepals ± translucent, 2–4.2 × 1–2.6 mm; dorsal sepal ovate to oblong; lateral sepals spreading to strongly recurved; petals usually projecting to erect, ± straight-sided, asymmetrically ovate to linear-lanceolate, 2–5.5 × 0.6–2 mm; lip ± deflexed, broadly ovate to lanceolate-elliptic, 2–5 × 1–3 mm; apex usually somewhat upcurved; spur horizontal to decurved, 2–5.5 mm, ± equal to lip; viscidia broadly elliptic-ovate, 0.15–0.5 × 0.1–0.3 mm; rostellum blunt. **Capsules** 3.5–10.5 mm. **Seeds** tan to cinnamon brown (Modified after Ackerman and Morgan 2003) Flora of North America illustration at: http://www.efloras.org/object_page.aspx?object_id=41626&flora_id=1



Photos: John E. Maunder

Figure B-1. Description: [a] flower (front view), [b] flower (side view, showing spur), [c] flower (top view), [d] developing seed capsules, [e] closeup of inflorescence, [f] basal leaves.

Habitat (Fig. B-2)



Photos: John E. Maunder

Figure B-2. Habitat: [a] inflorescence, with water horsetail, [b] whole plant in small clearing surrounded by balsam fir, [c] longer view of same (whole single plant at center), [d] general mossy shrub swamp habitat

Collections Examined

Provincial Museum of Newfoundland and Labrador.

NDC 00-775 (NFM 5986) [see Appendix A for details]

Agriculture and Agrifood Canada Herbarium (DAO)

Larry Johnson *s.n.* (DAO 691398), examined via digital image from DAO
[See Appendix A for details]