The Status of 
Alaska Rein Orchid
(Platanthera foetida)
in Newfoundland and Labrador

THE SPECIES STATUS ADVISORY COMMITTEE REPORT NO. 14

February 20, 2008
ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment:</th>
<th>Current designation:</th>
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</thead>
<tbody>
<tr>
<td>Endangered</td>
<td>None</td>
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</table>

Criteria met:
D1. Number of mature individuals <250

Reasons for designation:
Qualifies as "endangered" under the SSAC/COSEWIC criteria D1

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[The Flora of North America treatment for this taxon (Ackerman and Morgan 2003) is obsolete, in that it continues to employ the widely-used name Piperia unalascensis.]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

<table>
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<th>National</th>
<th>Provincial</th>
<th>Adjacent Jurisdictions</th>
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[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.]
Sources of Information and List of References


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

<table>
<thead>
<tr>
<th>Distribution and Population Information</th>
<th>Criteria Assessment</th>
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</thead>
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<tr>
<td>Extent of occurrence (EO) (km²)</td>
<td>0.072 km²</td>
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<tr>
<td>Area of occupancy (AO) (km²)</td>
<td>0.0025 km²</td>
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<tr>
<td>Number of extant locations</td>
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<tr>
<td>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</td>
<td>unknown; first verified for the Province in 1996.</td>
</tr>
<tr>
<td>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</td>
<td>unknown; first verified for the Province in 1996.</td>
</tr>
<tr>
<td>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</td>
<td>unknown; perennial</td>
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<tr>
<td>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</td>
<td>maximum recorded count of &lt;55 flowering stems; actual number of plants extant is almost certainly higher - probably 200 or more</td>
</tr>
<tr>
<td>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</td>
<td>unknown; first verified for the Province in 1996.</td>
</tr>
<tr>
<td>Are there extreme fluctuations (&gt;1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</td>
<td>unknown; the percentage of flowering stems versus dormant tubers/leafy stems can vary greatly from year to year</td>
</tr>
<tr>
<td>Is the total population severely fragmented (most individuals found within small and isolated populations)</td>
<td>only one Newfoundland population known</td>
</tr>
</tbody>
</table>

**Rescue Effect (immigration from an outside source)**

<table>
<thead>
<tr>
<th>Does species exist elsewhere?</th>
<th>Yes</th>
</tr>
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<tbody>
<tr>
<td>Status of the outside population(s)? [adjacent Provinces only]</td>
<td>Québec, may be at risk</td>
</tr>
<tr>
<td>Is immigration known or possible?</td>
<td>unknown</td>
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<tr>
<td>Would immigrants be adapted to survive here?</td>
<td>unknown</td>
</tr>
<tr>
<td>Is there sufficient habitat for immigrants here?</td>
<td>unknown</td>
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</table>
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).

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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](http://www.efloras.org/object_page.aspx?object_id=41626&flora_id=1)
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)

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]