

# Rare and Endemic Vascular Plants of Gwaii Haanas (South Moresby) Park, Queen Charlotte Islands, British Columbia

ISSN 0835 0752

February 1994



CANADA-BRITISH COLUMBIA PARTNERSHIP AGREEMENT ON FOREST RESOURCE DEVELOPMENT: FRDA II

**Rare and Endemic Vascular Plants  
of Gwaii Haanas (South Moresby) Park,  
Queen Charlotte Islands,  
British Columbia**

by

**R.T. Ogilvie**

Royal British Columbia Museum  
Victoria, B.C.

**February 1994**

---

CANADA-BRITISH COLUMBIA PARTNERSHIP AGREEMENT ON FOREST RESOURCE DEVELOPMENT: FRDA II

---

**Canada**



Funding for this publication was provided by the Canada-British Columbia Partnership Agreement on Forest Resource Development: FRDA II — a four year (1991–95) \$200 million program cost-shared equally by the federal and provincial governments.

### Canadian Cataloguing in Publication Data

Ogilvie, R. T. (Robert Townley), 1930-  
Rare and endemic vascular plants of Gwaii Haanas  
(South Moresby) Park, Queen Charlotte Island, British  
Columbia

(FRDA report, ISSN 0853-0752 ; 214)

"Canada-British Columbia Partnership Agreement on  
Forest Resource Development: FRDA II."

Co-published by B.C. Ministry of Forests.

Includes bibliographical references: p.

ISBN 0-7726-2058-X

1. Botany — British Columbia — Moresby Island Region.
2. Gwaii Haana National Park Reserve (B.C.) I. Canada.  
Forestry Canada. II. Canada-British Columbia  
Partnership Agreement on Forest Resource Development:  
FRDA II. III. British Columbia. Ministry of Forests.  
IV. Title. V. Series.

QK203.B74034 581.9'71112 C94-960085-7

© 1994 Government of Canada,  
Province of British Columbia

This is a joint publication of the Canadian Forest Service  
and the British Columbia Ministry of Forests

For additional copies and/or further information about the Canada-British Columbia  
Partnership Agreement on the Forest Resource Development: FRDA II, contact:

Canadian Forest Service  
Pacific Forestry Centre  
506 West Burnside Road  
Victoria, B.C. V8Z 1M5  
(604) 363-0600

or

B.C. Ministry of Forests  
Research Branch  
31 Bastion Square  
Victoria, B.C. V8W 3E7  
(604) 387-6719

## ABSTRACT

Inventories of the vascular flora of seven mountains and one estuary were made in Gwaii Haanas (South Moresby) Park. High species diversity was found in the alpine areas; up to 79 taxa per mountain site were recorded, including up to 18 endemic and rare taxa. Twenty-six endemic and rare taxa were recorded for all inventoried areas. Many of the endemic and rare taxa records are important range extensions, since they had previously been found in only two to four localities on Moresby Island. One new species record for the Queen Charlotte Islands was found (*Penstemon davidsonii*). The habitats richest in endemic and rare species are vertical rock cliffs, runnel walls, and steep-sided outcrops.

Signs of the introduced black-tailed deer were observed in seven of the inventoried areas. Grazing of ferns and forbs and browsing of shrubs are common. This poses a serious threat to the scarce endemic and rare plant species.

## ACKNOWLEDGEMENTS

I thank the following people for making this project possible: Patricia Benson, Parks Canada, for arranging the travel and field expenses; Mark Walmsley, Westland Resource Group, and Chris Clement, Shearwater Mapping, for organising the field scheduling and helicopter flights; Colin Clement for his excellent field assistance and company; Dr. T.C. Brayshaw, Royal British Columbia Museum, for checking the identifications of *Sparganium* and *Ranunculus*; and Dr. A. Ceska, Royal British Columbia Museum, for checking the identifications of *Carex* and *Juncus*. I thank Gordon Greene, Royal British Columbia Museum, for his help in preparing the computer map. Dr. W.B. Schofield, University of British Columbia, and Dr. Jim Pojar, British Columbia Ministry of Forests, made valuable reviews of the paper, for which I am most grateful.

Cover illustration of *Geum schofieldii* is reproduced from Agriculture Canada Monograph No.4 Part 1, *Flora of the Queen Charlotte Islands*, 1968, by permission of the Minister, Supply and Services Canada, 1994.

## TABLE OF CONTENTS

ABSTRACT .....	iii
ACKNOWLEDGEMENTS .....	iv
1 INTRODUCTION .....	1
2 METHODS .....	1
3 RESULTS .....	3
3.1 Rare and Endemic Plants of Moresby Island.....	3
3.1.1 Endemics.....	3
3.1.2 Rare.....	4
3.2 Mt. Laysen .....	5
3.2.1 Endemics.....	5
3.2.2 Rare.....	5
3.2.3 Other species .....	6
3.3 Yatza Mountain .....	7
3.3.1 Endemics.....	7
3.3.2 Rare.....	7
3.3.3 Other species .....	7
3.4 Barry Peak .....	8
3.4.1 Endemics.....	8
3.4.2 Rare.....	8
3.4.3 Other species .....	8
3.5 Pocket Peak .....	9
3.5.1 Endemics.....	10
3.5.2 Rare.....	10
3.5.3 Other species .....	10
3.6 De La Beche Ridge .....	11
3.6.1 Endemics.....	11
3.6.2 Rare.....	12
3.6.3 Other species .....	12
3.7 Kunghit Island .....	13
3.7.1 Endemics.....	13
3.7.2 Rare.....	13
3.7.3 Trees (krummholz and elfinwood) .....	13

## TABLE OF CONTENTS

3.7.4 Open heath meadow .....	13
3.7.5 Bogs and peaty areas .....	14
3.7.6 Ponds.....	14
3.7.7 Exposed bedrock.....	14
3.8 Anna Lake Waterfall .....	15
3.8.1 Endemics.....	15
3.8.2 Rare.....	15
3.8.3 Waterfall - cliffs, ledges, and streambed .....	15
3.8.4 Meadow at lake margin .....	16
3.8.5 Forest beside lake.....	16
3.9 Hutton Inlet Estuary.....	17
3.9.1 Rare.....	17
3.9.2 Meadow and intertidal.....	17
3.9.3 Forest bordering estuary meadow .....	18
3.10 Cape St. James.....	18
3.11 Deer Browsing and Grazing .....	19
4 DISCUSSION.....	20
4.1 Mt. Laysen.....	20
4.2 Yatza Mountain .....	21
4.3 Barry Peak .....	21
4.4 Pocket Peak.....	21
4.5 De la Beche Ridge .....	22
4.6 Kunghit Island.....	22
4.7 Anna Lake Waterfall .....	22
4.8 Hutton Inlet Estuary .....	22
4.9 Cape St. James.....	22
4.10 Species Occurrence Among Mountain Areas .....	22
REFERENCES .....	24

## 1 INTRODUCTION

Since the publication in 1968 of *Flora of the Queen Charlotte Islands*, by James Calder and Roy Taylor, biologists have had a comprehensive treatment of the endemic and rare vascular plants of those islands. This book lists the known occurrences of all species and shows them on dot maps. The geographic distribution patterns of the species are discussed in detail. These phytogeographic data are analyzed for their relevance to understanding the origin and history of the flora of the Queen Charlotte Islands, and to a proposed glacial refugium on those islands.

Recent field work has extended the ranges of some of the Queen Charlotte Islands' endemic species to adjacent islands and to northwest Vancouver Island (Pojar 1980; Roemer and Ogilvie 1983; Ogilvie and Ceska 1984; Ogilvie and Roemer 1984; Ogilvie and Ceska 1988; Taylor 1989; Ogilvie 1989; Ogilvie 1991; Ogilvie in press). What Calder and Taylor originally described as Queen Charlotte endemics are now known as northern Pacific

Coast endemics. These topics of endemic and disjunct species, biogeographic patterns, and glacial refugia are expanded and brought up to date in the *Queen Charlotte Islands Symposium Proceedings*, published in 1989 (Scudder and Gessler). In that publication there is a discussion of the endemic flora as part of a northern Pacific Coast element, associated with a chain of coastal glacial refugia (Heusser 1989). *Rare Vascular Plants of British Columbia* (Straley *et al.* 1985) includes documentation of all the rare plant species of the Queen Charlotte Islands, and designates the Charlottes as a major centre of concentration of rare species in the province.

Comprehensive species inventories are needed for accurate understanding of species rarity, and for the protection and management of rare species. For these purposes, and to fill in the distribution gaps in the flora of the Queen Charlotte Islands, selected mountain areas on Moresby Island were inventoried.

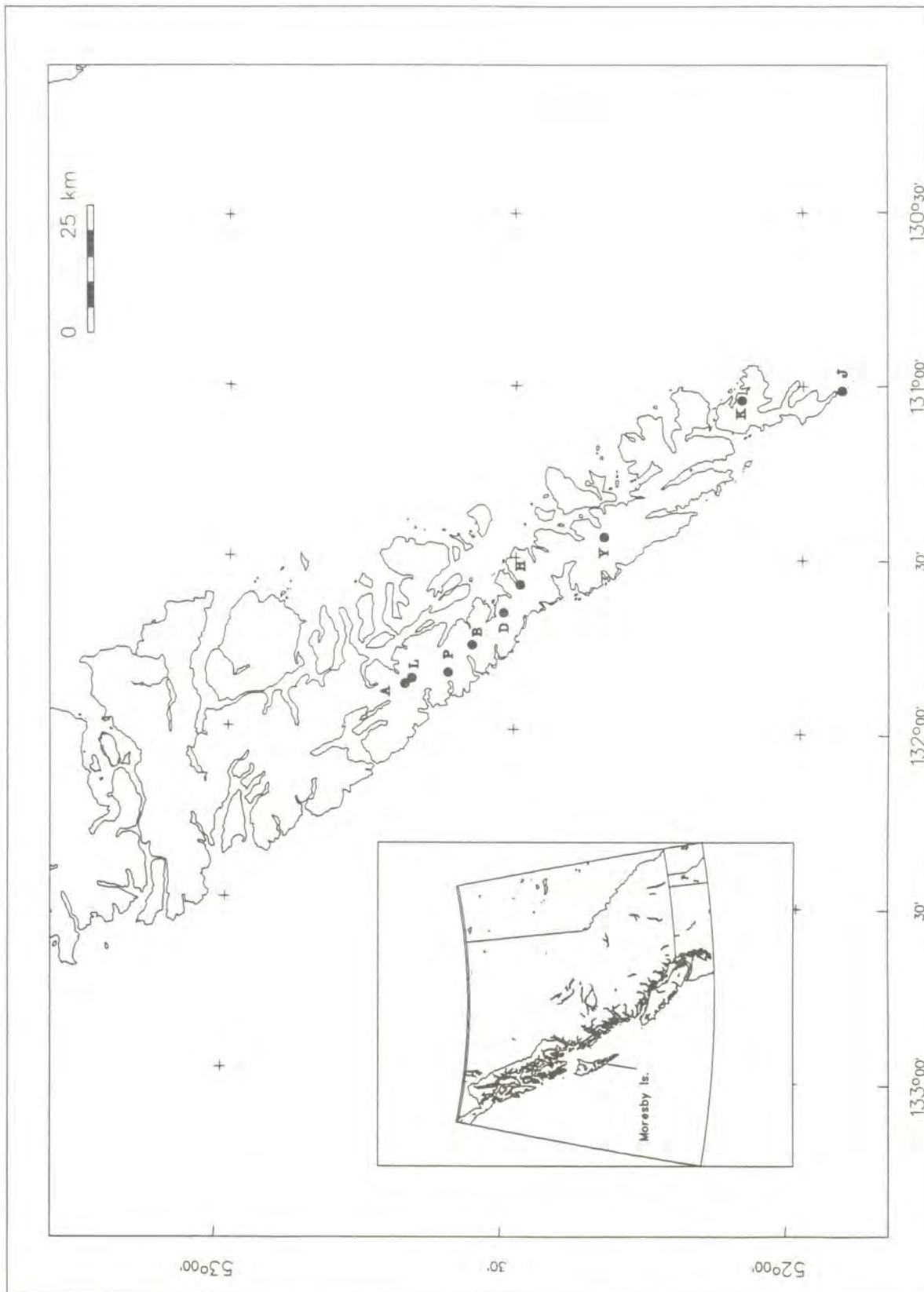
---

## 2 METHODS

Field inventories of vascular plant species were carried out on seven mountain areas and one estuary during 20–25 August 1992 (Figure 1). In each inventoried area, all vascular plant species and their habitat conditions were recorded. Voucher specimens of critical species

were collected, identified, and deposited in the herbarium of the Royal British Columbia Museum, Victoria. Additional observations were recorded in each area of sightings, signs, and browsing effects of black-tailed deer.





**Figure 1.** Map of Moresby Island showing study sites.

### 3 RESULTS

The floristic inventory data are presented for each locality with the following information: location, latitude and longitude, altitude, general vegetation pattern with the dominant species, the endemic taxa, the rare taxa, and the other taxa for that site. The relative abundance of each species in the site is rated using the following qualitative scale: 1 – very scarce, 2 – scarce, 3 – occasional, 4 – abundant, 5 – very abundant. Note that the abundance rating applies to the species only in that specific site, and is unrelated to the rarity rating, which applies to the extent of geographic distribution and the size of the populations of a species over the entire province. For example, *Geum calthifolium* is rated abundant for the Mt. Laysen site, although it is rare for the province as a whole. Conversely, *Polygonum viviparum* is rated very scarce in the Mt. Laysen site, although it is a common, widespread alpine species over much of the province. The dominant species are listed in the general vegetation type, and can be assumed to rate very abundant or abundant for that specific site. The habitat(s) of each species

is given for that specific locality. Asterisks denote rare or endemic species.

The nomenclature is that of Calder and Taylor (1968), except for a few recent name changes. In these cases the names are listed in parentheses.

A listing of the endemic and rare species recorded from Moresby Island follows. The list is based on Calder and Taylor (1968), and Taylor (1989). The rarity rating follows Straley *et al.* (1985): R1 – very restricted distribution, few populations and few individuals; R2 – restricted distribution, few populations with large number of individuals; R3 – widely scattered distribution, isolated populations of few plants; R4 – restricted narrow distribution but large populations. The current Conservation Data Centre rating (1993) is also included: Red – T/E = Threatened/Endangered, V = Vulnerable, R = Rare; Blue – "infrequent, locally frequent or locally common, which may become vulnerable."

---

#### 3.1 Rare and Endemic Plants of Moresby Island

##### 3.1.1 Endemics

*Geum schofieldii* – R1; Rare

*Isopyrum savilei* – R3; Blue

*Ligusticum calderi* – R3; Blue

*Mimulus guttatus* ssp. *haidensis*

*Salix reticulata* ssp. *glabellcarpa* – R1; T/E

*Saxifraga punctata* ssp. *carlottae* (*S. nelsonii* ssp. *carlottae*) – T/E

*Saxifraga taylori* – R4

*Senecio moresbiensis* (*S. cymbalarioides* ssp. *moresbiensis*) – R2; Blue

*Senecio newcombei* – R4; Blue

*Viola biflora* ssp. *carlottae* – R2

### 3.1.2 Rare

- Agrostis pallens* – R2; Rare  
*Amsinckia spectabilis* – R2; Blue  
*Astragalus robbinsii* – R4  
*Boschniakia hookeri* – R1  
*Calamagrostis crassiglumis* – R2  
*Calamagrostis sesquiflora* (*C. purpurascens* ssp. *tasuensis*) – R4; Rare  
*Caltha biflora* – R4  
*Campanula alaskana* – R4  
*Cardamine angulata* – Rare  
*Cardamine umbellata* – Rare  
*Carex circinata* – R4  
*Carex enanderi* – R3  
*Carex glareosa* – R2; Rare  
*Carex gmelinii* – R2; Rare  
*Cassiope lycopodioides* – R4  
*Castilleja hyetophila* – R1  
*Cerastium fischerianum* – R1; Rare  
*Cochlearia officinalis* – R4  
*Douglasia laevigata* – R1; V  
*Draba hyperborea* – R4  
*Draba lonchocarpa* var. *kamtschatica* (var. *vestita*) – R1; Rare  
*Gentiana platypetala* – R4  
*Geum calthifolium* – R4  
*Glehnia littoralis* ssp. *leiocarpa* – R4; Rare  
*Hammarbya paludosa* (*Malaxis paludosa*) – R2; Rare  
*Huperzia selago* var. *miyoshianum* (*Lycopodium selago* ssp. *miyoshianum*) – R4  
*Juncus regelii* – R3  
*Juncus triglumis* (*J. albescens*) – R2; Rare  
*Ligusticum scoticum* ssp. *hultenii* – R1; Blue  
*Lilaeopsis occidentalis* – R3; Blue  
*Lloydia serotina* – R4; Blue  
*Lobelia dortmanna* – R3  
*Mecodium wrightii* (*Hymenophyllum wrightii*) – R2  
*Mertensia maritima* – R1; Rare  
*Montia fontana* – R4  
*Oxalis oregana* – R1; Rare  
*Pedicularis lanata* – R3  
*Pedicularis oederi* – R3; Rare  
*Pedicularis parviflora* (*P. pennellii* ssp. *insularis*) – R3; Rare  
*Pedicularis verticillata* – R3; Rare  
*Pinguicula vulgaris* ssp. *macroceras* – R4  
*Plantago macrocarpa* – R3; Blue  
*Platanthera chorisiana* (*Habenaria chorisiana*) – R4; Rare  
*Poa confinis* – R4  
*Poa laxiflora* – R1; Blue  
*Polypodium scouleri* – R4 (Monitor)

*Polystichum setigerum* (*P. braunii* ssp. *alaskense*) – R2; Rare  
*Ranunculus pygmaeus* – R3 (Monitor)  
*Saussurea americana* – R3  
*Sparganium glomeratum* – R1; Rare  
*Sparganium hyperboreum* – R4  
*Swertia perennis* – R2  
*Thelypteris limbosperma* (*Th. oreopteris*, *Th. quelpaertensis*) – R3; Rare

### 3.2 Mount Laysen

Map Sheet 103B/12. Lat 52° 40.8'N, Long 131° 51.32'W. Altitude: 860–1050 m.

#### Trees (krummholz, elfinwood)

*Picea sitchensis*, *Pinus contorta* (seedling), *Tsuga mertensiana*.

#### Heath

*Cassiope stelleriana*, *Cassiope mertensiana*, *Phyllodoce glanduliflora*, *Vaccinium uliginosum*,  
*Vaccinium caespitosum*, *Empetrum nigrum*, *Luetkea pectinata*.

#### Meadow

*Deschampsia cespitosa*, *Phleum alpinum*, *Luzula multiflora*.

#### 3.2.1 Endemics

*Geum schofieldii* – very scarce; ridge cliffs  
*Isopyrum savilei* – occasional; rock cliffs, runnel walls, ridge, scree  
*Ligusticum calderi* – scarce; meadows, ravine walls  
*Salix reticulata* ssp. *glabellcarpa* – scarce; rock cliffs, ridge, peak  
*Saxifraga punctata* ssp. *carlottae* – scarce; runnels walls, outcrops  
*Saxifraga taylori* – occasional; rock cliffs, ledges, runnel walls, peak  
*Senecio moresbiensis* – scarce; runnel walls, cliff ledges, ridge, peak  
*Senecio newcombei* – occasional; runnel walls, ridge  
*Viola biflora* ssp. *carlottae* – very scarce; rock cliff

#### 3.2.2 Rare

*Calamagrostis sesquiflora* – occasional; outcrops, runnels, ridges, peak  
*Campanula alaskana* – abundant; meadow, cliffs, ledges, ridge  
*Carex circinata* – occasional; rock outcrop, ridge, peak  
*Cassiope lycopodioides* – scarce; outcrops, heath  
*Gentiana platypetala* – abundant; heath, meadow, ravine, ridge  
*Geum calthifolium* – abundant; heath, meadow, cliffs, runnel, ridge  
*Lloydia serotina* – very scarce; runnel ledges, cliff ledges  
*Pedicularis lanata* – very scarce; ridge, cliff  
*Pinguicula vulgaris* ssp. *macroceras* – scarce; peaty slope

### 3.2.3 Other species

- Anemone narcissiflora* – very scarce; cliffs, ridge  
*Ranunculus cooleyae* – occasional; runnel walls, ridge, seepage  
*Sedum roseum* ssp. *roseum* – very scarce; rock blocks, scree  
*Phleum alpinum* – scarce; meadow, seepage  
*Polygonum viviparum* – very scarce; rock cliff  
*Artemisia arctica* (*Artemisia norvegica*) – very scarce; cliff ledges  
*Arnica latifolia* var. *latifolia* – scarce; ravine  
*Hieracium triste* – scarce; runnel walls  
*Saxifraga ferruginea* ssp. *diffusa* – very scarce; runnel walls  
*Saxifraga ferruginea* ssp. *ferruginea* – scarce; peak, ridge, seepage  
*Hippuris montana* – scarce; peak, ridge, seepage  
*Saxifraga tolmiei* – scarce; peak, ridge, seepage  
*Polystichum lonchitis* – scarce; scree  
*Castilleja parviflora* – very scarce; cliff ledge  
*Dodecatheon jeffreyi* – scarce; heath  
*Fauria crista-galli* – occasional; heath, ravine  
*Agrostis* sp. – scarce; heath, meadow  
*Pedicularis ornithorhyncha* – scarce; heath, meadow, ravine walls  
*Lupinus nootkatensis* – occasional; heath, peak  
*Apargidium boreale* – occasional; heath, bog  
*Huperzia selago* – occasional; heath, runnel, cliff ledge  
*Lycopodium alpinum* – occasional; heath  
*Lycopodium clavatum* – scarce; meadow  
*Gentiana douglasiana* – occasional; heath, bog  
*Blechnum spicant* – occasional; elfinwood, runnel  
*Luzula multiflora* – occasional; meadow  
*Luzula parviflora* ssp. *melanocarpa* – occasional; meadow  
*Veratrum eschscholtzii* – occasional; meadow, ravine  
*Heuchera glabra* – occasional; rock outcrops, runnel walls  
*Polypodium glycyrrhiza* (*Polypodium vulgare* ssp. *occidentale*) – occasional; rock crevices  
*Carex macrochaeta* – scarce; runnel  
*Calamagrostis nutkaensis* – abundant; heath  
*Calamagrostis canadensis* – occasional; elfinwood, meadow  
*Osmorhiza purpurea* – occasional; bog  
*Senecio triangularis* – occasional; meadow, seepage, runnel  
*Achillea millefolium* – occasional; meadow  
*Tofieldia glutinosa* – scarce; seepage  
*Prenanthes alata* – scarce; meadow, slump  
*Athyrium filix-femina* – scarce; runnel bottom, scree  
*Cornus unalaschkensis* – occasional; heath, elfinwood  
*Erigeron peregrinus* ssp. *peregrinus* – scarce; ravine  
*Epilobium anagallidifolium* – occasional; runnel walls, peak, seepage  
*Juncus mertensianus* – occasional; pond  
*Rubus pedatus* – occasional; heath  
*Coptis asplenifolia* – occasional; heath

### 3.3 Yatza Mountain

Map Sheet 103B/6. Lat 52° 20.7'N, Long 131° 26.35'W. Altitude: 710–725 m.

#### Trees (krummholz and elfinwood)

*Tsuga mertensiana*, *Pinus contorta*, *Picea sitchensis*.

#### Heath

*Empetrum nigrum*, *Vaccinium uliginosum*, *Phyllodoce glanduliflora*, *Luetkea pectinata*, *Cassiope mertensiana*, *Cassiope stelleriana*, *Vaccinium caespitosum*.

#### 3.3.1 Endemics

*Isopyrum savilei* – very scarce; rock runnels  
*Ligusticum calderi* – scarce; heath, elfinwood  
*Saxifraga taylori* – scarce; rock outcrops  
*Senecio moresbiensis* – scarce; heath  
*Senecio newcombei* – occasional; heath, rock outcrops  
*Viola biflora* ssp. *carlottae* – scarce; rock channels

#### 3.3.2 Rare

*Calamagrostis sesquiflora* – scarce; heath  
*Campanula alaskana* – scarce; rock runnels, heath  
*Carex circinata* – occasional; rock outcrops  
*Cassiope lycopodioides* – very scarce; rock outcrop  
*Geum calthifolium* – occasional; heath, rock crevices  
*Lloydia serotina* – very scarce; rock crevices  
*Pinguicula vulgaris* ssp. *macroceras* – scarce; heath

#### 3.3.3 Other species

*Anemone narcissiflora* – scarce; rock runnel  
*Dodecatheon jeffreyi* – scarce; seepage  
*Heuchera glabra* – scarce; rock runnels, scree  
*Huperzia selago* – occasional; elfinwood  
*Listera cordata* – scarce; elfinwood  
*Calamagrostis nootkaensis* – occasional; heath  
*Cornus unalaschkensis* – occasional; heath  
*Fauria crista-galli* – occasional; heath  
*Agrostis* sp. – scarce; heath  
*Blechnum spicant* – occasional; heath  
*Veratrum eschscholtzii* – scarce; rock blocks  
*Trichophorum cespitosum* (*Scirpus cespitosus*) – occasional; heath  
*Coptis asplenifolia* – occasional; heath  
*Apargidium boreale* – scarce; elfinwood

*Calamagrostis canadensis* – occasional; elfinwood  
*Streptopus streptopoides* – scarce; elfinwood  
*Rubus pedatus* – occasional; elfinwood  
*Saxifraga ferruginea* ssp. *ferruginea* – scarce; rock blocks  
*Polypodium glycyrrhiza* – scarce; rock blocks  
*Polypodium hesperium* (*Polypodium vulgare* ssp. *columbianum*) – very scarce; rock blocks  
*Luzula multiflora* – occasional; heath  
*Carex macrochaeta* – occasional; heath

### 3.4 Barry Peak

Map Sheet 103B/12. Lat 52° 34.5'N, Long 131° 45.3'W. Altitude: 710–865 m. Mountain peak at the head of Barry Inlet and southward.

#### Summit heath

*Deschampsia cespitosa* ssp. *beringensis*, *Phylodoce glanduliflora*, *Cassiope mertensiana*, *Rubus pedatus*, *Luetkea pectinata*, *Luzula multiflora*, *Vaccinium uliginosum*, *Empetrum nigrum*, *Cassiope stelleriana*.

#### Trees (krummholz and dwarf)

*Picea sitchensis*, *Chamaecyparis nootkatensis*, *Tsuga mertensiana*.

### 3.4.1 Endemics

*Isopyrum savilei* – occasional; rock, cliff crevices, runnel walls, scree  
*Ligusticum calderi* – occasional; cliffs, rock runnels, rock blocks, heath  
*Saxifraga taylori* – scarce; rock cliffs, crevices, runnels  
*Senecio newcombei* – occasional; heath, runnels  
*Viola biflora* ssp. *carlottae* – occasional; cliffs, runnels, seepage

### 3.4.2 Rare

*Calamagrostis sesquiflora* – scarce; heath, ridges  
*Campanula alaskana* – occasional; rock runnels, rock blocks  
*Carex circinata* – scarce; rock blocks, cliffs, runnel walls  
*Cassiope lycopodioides* – very scarce; rock blocks  
*Gentiana platypetala* – scarce; heath, runnels, seepage  
*Geum calthifolium* – occasional; rock runnels, crevices, rock blocks  
*Huperzia selago* ssp. *miyoshianum* – scarce; rock blocks, seepage  
*Lloydia serotina* – very scarce; cliff crevices  
*Platanthera chorisiana* – very scarce; seepage peat

### 3.4.3 Other species

*Anemone narcissiflora* – scarce; rock runnels  
*Dodecatheon jeffreyi* – scarce; meadow, seepage

*Heuchera glabra* – scarce; rock blocks, rock channel, ravine walls  
*Cornus unalaschkensis* – scarce; heath  
*Coptis asplenifolia* – scarce; heath  
*Listera cordata* – scarce; heath  
*Saxifraga ferruginea* ssp. *ferruginea* – very scarce; rock blocks  
*Rubus spectabilis* – scarce; around rocks  
*Lupinus nootkatensis* – occasional; rock crevices, runnels  
*Ranunculus cooleyae* – occasional; cliffs, crevices, scree, heath  
*Erigeron peregrinus* ssp. *peregrinus* – scarce; vertical rock channels  
*Castilleja parviflora* – very scarce; rock runnel  
*Lycopodium clavatum* – scarce; heath, rock  
*Gentiana douglasii* – scarce; meadow  
*Apargidium boreale* – scarce; meadow  
*Athyrium filix-femina* – scarce; rock blocks  
*Calamagrostis nootkaensis* – occasional; heath, meadow  
*Heracleum lanatum* – scarce; meadow, rock blocks  
*Senecio triangularis* – scarce; meadow, rock blocks  
*Blechnum spicant* – occasional; meadow, rock blocks  
*Pedicularis ornithorhyncha* – scarce; rock cliff, seepage  
*Arnica latifolia* – scarce; rock runnel  
*Prenanthes alata* – scarce; rock crevices  
*Lycopodium alpinum* – scarce; heath meadow  
*Fauria crista-galli* – scarce; rock blocks, seepage  
*Isoetes echinospora* – very scarce; pond margin  
*Polystichum munitum* – scarce; rock blocks  
*Tofieldia glutinosa* – scarce; seepage, meadow  
*Trichophorum cespitosum* – scarce; seepage, meadow  
*Danthonia intermedia* – scarce; seepage, meadow  
*Deschampsia cespitosa* ssp. *beringensis* – very abundant; heath, heath-meadows, seepage, meadows  
*Vaccinium caespitosum* – scarce; heath, rock blocks  
*Vaccinium ovalifolium* – scarce; heath, rock blocks

### 3.5 Pocket Peak

Map Sheet 103B/12. Lat 52° 37'N, Long 131° 50.2'W. Altitude: 850 – 1000 m. Mountain Peak at the head of Pocket Inlet, San Cristoval Range.

#### Heath

*Phyllodoce glanduliflora*, *Cassiope mertensiana*, *Empetrum nigrum*, *Deschampsia cespitosa*, *Luetkea pectinata*, *Cassiope stelleriana*, *Vaccinium uliginosum*, *Loiseleuria procumbens*.

#### Trees (krummholz and dwarf)

*Tsuga mertensiana*, *Picea sitchensis*, *Pinus contorta* ssp. *contorta*.



### 3.5.1 Endemics

- Isopyrum savilei* – occasional; rock cliff, runnel  
*Ligusticum calderi* – very scarce; heath  
*Saxifraga punctata* ssp. *carlottae* – scarce; rock blocks, runnel  
*Saxifraga taylora* – occasional; rock cliff, runnel, rock block, scree  
*Senecio moresbiensis* – very scarce; runnel wall  
*Senecio newcombei* – scarce; rock cliff, heath  
*Viola biflora* ssp. *carlottae* – very scarce; heath ridge

### 3.5.2 Rare

- Calamagrostis sesquiflora* – occasional; ridge, outcrop, rock cliff, heath  
*Caltha biflora* – very scarce; seepage  
*Campanula alaskana* – scarce; ridge crest, rock cliffs, meadow  
*Carex circinata* – scarce; ridge crest, rock cliff  
*Cassiope lycopodioides* – scarce; rock chasm  
*Gentiana platypetala* – occasional; heath, cliff, rock blocks  
*Geum calthifolium* – occasional; heath, cliff, rock cleft  
*Lloydia serotina* – very scarce; rock cliff  
*Pinguicula vulgaris* ssp. *macroceras* – scarce; moist ravine

### 3.5.3 Other species

- Gentiana douglasiana* – very scarce; heath  
*Fauria crista-galli* – scarce; heath  
*Carex* sp. – scarce; heath  
*Saxifraga ferruginea* – occasional; rock outcrop, scree, runnel  
*Selaginella selaginoides* – very scarce; heath  
*Rubus pedatus* – scarce; krummholz, heath  
*Streptopus streptopoides* – very scarce; krummholz  
*Coptis asplenifolia* – very scarce; krummholz  
*Lupinus nootkatensis* – abundant; krummholz, runnels, outcrops, cliffs, rock blocks  
*Apargidium boreale* – very scarce; heath  
*Dodecatheon jeffreyi* – very scarce; heath  
*Blechnum spicant* – very scarce; heath  
*Anemone narcissiflora* – very scarce; rock cleft  
*Cornus unalaschkensis* – very scarce; rock cleft  
*Penstemon davidsonii* – very scarce; ridge crest. New to the Queen Charlotte Islands.  
*Veratrum eschscholtzii* – scarce; meadow  
*Trientalis arctica* – very scarce; heath, krummholz  
*Calamagrostis nootkaensis* – occasional; heath, meadow, krummholz rim  
*Lycopodium alpinum* – very scarce; krummholz rim  
*Tofieldia glutinosa* – very scarce; seepage  
*Hippuris montana* – very scarce; peaty pocket, cliff crevices  
*Luzula multiflora* var. *frigida* – occasional; heath, seepage  
*Hieracium triste* – scarce; seepage, runnel

*Ranunculus cooleyae* – occasional; rock cliffs, runnels, rock walls, rock blocks  
*Phleum alpinum* – very scarce; heath  
*Heracleum lanatum* – occasional; meadow  
*Senecio triangularis* – scarce; meadow  
*Athyrium filix-femina* – scarce; rock crevices, rock blocks  
*Pedicularis ornithorhyncha* – scarce; heath, runnel, ravine  
*Vaccinium caespitosum* – occasional; heath, rock blocks  
*Prenanthes alata* – scarce; meadow, runnel crevice  
*Trichophorum cespitosum* – scarce; peaty hollow  
*Dryopteris expansa* – scarce; rock blocks  
*Sedum roseum* ssp. *roseum* – scarce; rock cliffs, rock blocks, scree  
*Artemisia arctica* – very scarce; rock cliff  
*Polystichum lonchitis* – very scarce; scree, runnel  
*Rubus spectabilis* – scarce; rock blocks  
*Valeriana sitchensis* – very scarce; rock blocks  
*Vaccinium* cf. *alaskaense* – very scarce; rock blocks  
*Erigeron peregrinus* ssp. *peregrinus* – occasional; ravine, runnel wall  
*Huperzia selago* ssp. *selago* – very scarce; runnel  
*Epilobium anagallidifolium* – very scarce; runnel wall  
*Heuchera glabra* – scarce; runnel, wall crevices  
*Juncus mertensianus* – very scarce; runnel  
*Luzula piperi* – scarce; runnel  
*Cladothamnus pyroliflorus* – very scarce; runnel wall  
*Oxyria digyna* – very scarce; runnel wall  
*Arnica latifolia* – very scarce; runnel crevices  
*Vahlodea atropurpurea* ssp. *paramushirensis* – scarce; runnel  
*Castilleja parviflora* – very scarce; runnel

### 3.6 De La Beche Ridge

Map Sheet 103B/12. Lat 52° 31.2'N, Long 131° 39.65'W. Altitude: 645–705 m. Ridge between de la Beche Inlet and Haswell Bay, east shore of Moresby Island.

#### Trees (krummholz)

*Pinus contorta* ssp. *contorta*, *Tsuga mertensiana*, *Chamaecyparis nootkatensis*.

#### Heath

*Empetrum nigrum*, *Vaccinium uliginosum*, *Cassiope mertensiana*, *Luetkea pectinata*, *Phyllodoce glanduliflora*.

#### 3.6.1 Endemics

*Ligusticum calderi* – occasional; heath, krummholz  
*Saxifraga taylori* – occasional; rock outcrops, rock blocks  
*Senecio newcombei* – scarce; crevices

### 3.6.2 Rare

- Caltha biflora* – scarce; heath  
*Campanula alaskana* – occasional; rock outcrops  
*Carex circinata* – scarce; rock outcrops  
*Gentiana platypetala* – scarce; moist heath  
*Geum calthifolium* – scarce; rocks  
*Pinguicula vulgaris* ssp. *macroceras* – scarce; seepage heath  
*Platanthera chorisiana* – very scarce; krummholz

### 3.6.3 Other species

- Dodecatheon jeffreyi* – scarce; rock pockets  
*Danthonia intermedia* – scarce; rock outcrop  
*Saxifraga ferruginea* – scarce; rock block  
*Loiseleuria procumbens* – scarce; bedrock  
*Cornus unalaschkensis* – occasional; heath  
*Rubus pedatus* – occasional; heath  
*Gaultheria shallon* – occasional; krummholz  
*Vaccinium caespitosum* – occasional; heath  
*Coptis asplenifolia* – occasional; heath  
*Blechnum spicant* – occasional; heath, rock pockets  
*Calamagrostis nutkaensis* – occasional; heath  
*Streptopus roseus* – scarce; krummholz  
*Athyrium filix-femina* – scarce; krummholz  
*Luzula multiflora* – occasional; heath  
*Deschampsia cespitosa* – scarce; heath  
*Apargidium boreale* – occasional; seepage  
*Fauria crista-galli* – occasional; rock pockets  
*Nuphar polysepala* – occasional; ponds  
*Sparganium* sp. – scarce; ponds  
*Trichophorum cespitosum* – occasional; around ponds  
*Juncus oreganus* – scarce; ponds  
*Tofieldia glutinosa* – scarce; around ponds  
*Veratrum eschscholtzii* – occasional; heath  
*Lupinus nootkatensis* – occasional; rock outcrops  
*Agrostis aequivallis* – occasional; peaty heath  
*Lycopodium alpinum* – scarce; heath  
*Lycopodium clavatum* – occasional; heath  
*Huperzia selago* – scarce; heath  
*Gentiana douglasiana* – occasional; heath  
*Cassiope stelleriana* – occasional; rock blocks, heath  
*Trientalis arctica* – scarce; around pond  
*Dryopteris expansa* – scarce; rock blocks

### 3.7 Kunghit Island

Map Sheet 103B/3. Lat 52° 06.38'N, Long 131° 02.5'W. Altitude: 490 m. Northeast ridge between Balcom Inlet and Heater Harbour.

#### 3.7.1 Endemics

*Ligusticum calderi* – occasional; heath, bedrock  
*Senecio newcombei* – scarce; heath

#### 3.7.2 Rare

*Calamagrostis sesquiflora* – occasional; bedrock  
*Campanula alaskana* – occasional; bedrock, heath  
*Carex circinata* – occasional; bedrock  
*Geum calthifolium* – scarce; bedrock  
*Pinguicula vulgaris* ssp. *macroceras* – occasional; peaty area

#### 3.7.3 Trees (krummholz and elfinwood)

*Chamaecyparis nootkatensis*, *Tsuga mertensiana*, *Pinus contorta* ssp. *contorta*, (*Picea sitchensis*).

*Empetrum nigrum* – abundant  
*Gaultheria shallon* – abundant  
*Calamagrostis nutkaensis* – abundant  
*Vaccinium caespitosum* – abundant  
*Vaccinium uliginosum* – occasional  
*Blechnum spicant* – occasional  
*Cornus unalaschkensis* – occasional  
*Lycopodium clavatum* – occasional  
*Veratrum eschscholtzii* – scarce  
*Vaccinium parvifolium* – scarce  
*Trientalis arcticus* – scarce  
*Rubus pedatus* – scarce  
*Coptis asplenifolia* – scarce  
*Kalmia microphylla* – scarce  
*Agrostis* sp. – scarce  
*Apargidium boreale* – scarce

#### 3.7.4 Open heath meadow

*Deschampsia cespitosa* – abundant  
*Empetrum nigrum* – abundant  
*Vaccinium uliginosum* – abundant  
*Vaccinium caespitosum* – occasional  
*Luetkea pectinata* – occasional  
*Rubus pedatus* – occasional  
*Cornus unalaschkensis* – occasional  
*Cassiope stelleriana* – scarce

*Calamagrostis nutkaensis* – occasional  
*Trichophorum cespitosum* – occasional  
*Huperzia selago* – scarce  
*Fauria crista-galli* – scarce

### 3.7.5 Bogs and peaty areas

*Kalmia microphylla* – occasional  
*Trichophorum cespitosum* – occasional  
*Eriophorum* sp. – occasional  
*Ledum groenlandicum* – occasional  
*Carex* sp. – occasional  
*Apargidium boreale* – occasional  
*Vaccinium oxycoccus* – occasional  
*Vaccinium uliginosum* – scarce  
*Calamagrostis nutkaensis* – scarce  
*Huperzia selago* – scarce  
*Trientalis arctica* – scarce  
*Drosera rotundifolia* – scarce  
*Fauria crista-galli* – scarce  
*Sanguisorba officinalis* ssp. *microcephala* – scarce  
*Gentiana douglasiana* – scarce  
*Tofieldia glutinosa* – very scarce

### 3.7.6 Ponds

*Juncus oreganus* – abundant  
*Sparganium angustifolium* ssp. *angustifolium* – occasional  
*Nuphar polysepalum* – occasional  
*Eriophorum* sp. – occasional  
*Carex* sp. – occasional  
*Lysichiton americanum* – scarce

### 3.7.7 Exposed bedrock

\**Geum calthifolium* – scarce  
*Saxifraga ferruginea* var. *diffusa* – very scarce  
\**Carex circinata* – abundant  
*Polypodium glycyrhiza* – scarce  
*Polypodium hesperium* – scarce  
*Selaginella wallacei* – very scarce  
*Agrostis idahoensis* (*Agrostis borealis*) – scarce  
\**Calamagrostis sesquiflora* – abundant  
\**Campanula alaskana* – abundant  
\**Ligusticum calderi* – occasional  
*Loiseleuria procumbens* – very scarce  
*Huperzia selago* – scarce

### 3.8 Anna Lake Waterfall

Map Sheet 103B/12. Lat 52° 41.5'N, Long 131° 52.27'W. Altitude: 150–230 m. Upper end of Anna Lake.

#### 3.8.1 Endemics

- Ligusticum calderi* – scarce; waterfall ledges, lake meadow  
*Mimulus guttatus* ssp. *haidensis* – very scarce; lake meadow  
*Senecio moresbiensis* – very scarce; lake meadow  
*Viola biflora* ssp. *carlottae* – very scarce; lake meadow

#### 3.8.2 Rare

- Calamagrostis sesquiflora* – scarce; waterfall ledges  
*Caltha biflora* – occasional; lake meadow  
*Cassiope lycopodioides* – very scarce; upper waterfall cliff  
*Gentiana platypetala* – very scarce; lake meadow  
*Geum calthifolium* – scarce; upper waterfall cliff  
*Huperzia selago* var. *miyoshianum* – scarce; lake meadow  
*Pinguicula vulgaris* ssp. *macroceras* – scarce; lake meadow  
*Platanthera chorisiana* – very scarce; south end of lake  
*Thelypteris limbosperma* – scarce-occasional; lake meadow, waterfall

#### 3.8.3 Waterfall - cliffs, ledges, and streambed

- Adiantum pedatum* – occasional; ledges, cliffs, channel  
*Thelypteris phegopteris* – occasional; ledges, channel  
*Anemone narcissiflora* ssp. *alaskana* – very scarce; waterfall cliff  
*Tiarella trifoliata* – scarce; ledge  
*Athyrium filix-femina* – scarce; ledge  
\**Thelypteris limbosperma* – occasional; cliffs, ledges, channel  
*Polystichum munitum* – occasional; ledges, cliffs  
*Aster subspicatus* – occasional; ledge, streambed  
*Aruncus dioica* (*Aruncus sylvester*) – scarce; ledge  
\**Ligusticum calderi* – scarce; channel  
*Cornus unalaschkensis* – scarce; channel  
\**Huperzia selago* var. *miyoshianum* – scarce; channel  
*Blechnum spicant* – occasional; channel, cliff  
*Aquilegia formosa* – scarce; cliffs  
*Senecio triangularis* – scarce; cliffs  
*Polystichum lonchitis* – scarce; cliffs  
*Arnica amplexicaulis* – scarce; streambed  
*Heuchera glabra* – scarce; cliffs  
*Prenanthes alata* – scarce; cliff  
*Veratrum eschscholtzii* – scarce; cliff  
*Calamagrostis canadensis* – scarce; ledge

*Parnassia fimbriata* – scarce; cliff  
*Mitella pentandra* – scarce; cliff  
*Oplopanax horridus* – scarce; creek channel  
*Tofieldia glutinosa* – scarce; channel

### 3.8.4 Meadow at lake margin

*Deschampsia cespitosa* – abundant  
*Danthonia intermedia* – occasional  
*Carex viridula* – scarce  
*Juncus* sp. – occasional  
*Alnus crispa* – occasional  
\**Viola biflora* ssp. *carlottae* – very scarce  
*Ranunculus flammula* ssp. *reptans* – very scarce  
*Epilobium anagallidifolium* – scarce  
\**Pinguicula vulgaris* ssp. *macroceras* – scarce  
\**Gentiana platypetala* – very scarce  
*Parnassia fimbriata* – scarce  
\**Senecio moresbiensis* – very scarce  
*Botrychium multifidum* ssp. *silaiifolium* – very scarce  
*Senecio triangularis* – very scarce  
*Dodecatheon jeffreyi* – scarce  
*Veratrum eschscholtzii* – occasional  
*Selaginella selaginoides* – very scarce  
*Aster subspicatus* – occasional  
*Blechnum spicant* – occasional  
*Athyrium filix-femina* – occasional  
*Gentiana douglasiana* – scarce  
*Agrostis borealis* (*A. mertensii*) – scarce  
\**Ligusticum calderi* – scarce  
*Drosera rotundifolia* – very scarce  
\**Caltha biflora* – scarce  
\**Thelypteris limbosperma* – occasional  
\**Huperzia selago* var. *miyoshianum* – scarce  
*Lycopodium inundatum* – very scarce  
*Anaphalis margaritacea* – scarce  
*Apargidium boreale* – scarce  
\**Mimulus guttatus* ssp. *haidensis* – very scarce  
*Arnica amplexicaulis* – scarce

### 3.8.5 Forest beside lake

*Picea sitchensis*, *Tsuga heterophylla*, *Thuja plicata*, (*Pinus contorta* ssp. *contorta*).  
*Rubus spectabilis* – occasional  
*Menziesia ferruginea* ssp. *ferruginea* – occasional  
*Vaccinium ovalifolium* – occasional

*Coptis asplenifolia* – occasional  
*Prenanthes alata* – scarce  
*Osmorhiza chilensis* – scarce  
*Polystichum munitum* – occasional  
*Dryopteris expansa* – scarce  
*Athyrium filix-femina* – occasional  
*\*Thelypteris limbosperma* – occasional  
*Thelypteris phegopteris* – occasional  
*Mitella pentandra* – occasional  
*Tiarella trifoliata* – scarce  
*Listera cordata* – scarce  
*Listera caurina* – very scarce  
*Gymnocarpium dryopteris* – occasional  
*Polypodium glycyrrhiza* – scarce; epiphytic  
*Heracleum lanatum* – scarce  
*Oplopanax horridus* – occasional  
*Veratrum eschscholtzii* – occasional  
*Alnus crispa* – occasional  
*Adiantum pedatum* – scarce  
*Polystichum lonchitis* – very scarce  
*Aquilegia formosa* – scarce; uprooted tree  
*Streptopus* sp. – scarce  
*Taxus brevifolia* – scarce  
*Moneses uniflora* – scarce  
*\*Platanthera chorisiana* – very scarce

### 3.9 Hutton Inlet Estuary

Map Sheet 103B/5. Lat 52° 29.5'N, Long 131° 34.7'W. Altitude: sea level. Estuary meadow above the level of the stream; very little sign of flooding.

#### 3.9.1 Rare

*Cochlearia officinalis* ssp. *oblongifolia* – very scarce; intertidal

#### 3.9.2 Meadow and intertidal

*Deschampsia cespitosa* – very abundant; meadow  
*Trifolium wormskioldii* – abundant; meadow  
*Apargidium boreale* – occasional; meadow  
*Plantago maritima* – abundant; intertidal  
*Sagina crassicaulis* – very scarce; lower meadow  
*Hordeum brachyantherum* – occasional; meadow  
*Festuca rubra* ssp. *densiuscula* – occasional; meadow  
*Juncus* sp. – occasional; lower meadow  
*Juncus effusus* – occasional; lower meadow  
*Galium trifidum* – very scarce; meadow



*Salicornia pacifica* – scarce; lower intertidal  
*Spergularia canadensis* – very scarce; lower intertidal  
*Glaux maritima* – scarce; lower intertidal  
*Puccinellia nutkaensis* – very scarce; lower intertidal  
*Stellaria humifusa* – very scarce; intertidal

### 3.9.3 Forest bordering estuary meadow

*Picea sitchensis*  
*Tsuga heterophylla*  
*Thuja plicata*  
*Vaccinium parvifolium*  
*Menziesia ferruginea* ssp. *ferruginea*  
*Vaccinium ovalifolium*  
*Maianthemum dilatatum*  
*Athyrium filix-femina*  
*Dryopteris expansa*

### 3.10 Cape St. James

Map Sheet 103B/2. Lat 51° 56'N, Long 131° 0.8'W. Altitude: 30 m. Ladder walkway-ramp up to lighthouse.

*Saxifraga ferruginea* var. *diffusa* – cliffs  
*Angelica lucida* – cliffs  
*Mimulus* sp. – cliffs  
*Lonicera involucrata*  
*Rubus spectabilis*  
*Athyrium filix-femina*  
*Sambucus racemosa*  
*Stachys ciliata*  
*Achillea millefolium* – introduced  
*Rumex crispus* – introduced weed  
*Hypochoeris radicata* – introduced weed  
*Trifolium repens* – introduced  
*Ranunculus repens* – introduced weed  
*Plantago major* – introduced weed  
*Holcus lanata* – introduced  
*Sonchus asper* – introduced weed  
*Galium aparine* – introduced weed

### 3.11 Deer Browsing and Grazing

While carrying out the floristic inventory, observations on the deer were recorded, including signs of browsing and grazing, tracks, and droppings.

Mount Laysen - 940-1036 m altitude; alpine and timberline vegetation. Saw one doe on meadow slope and a heavily used bedding area in meadow bordering the krummholz.

Barry Peak - 865 m altitude; alpine and timberline vegetation. Grazing of *Fauria* (deer-cabbage) leaves, numerous deer tracks and droppings, black bear scat.

Pocket Peak - 850-1006 m altitude; alpine and timberline vegetation. Saw one deer at summit, numerous deer tracks and droppings, browsing of the tops of salmonberry, heavy grazing of: *Saxifraga punctata*, *Valeriana sitchensis*, *Vaccinium* cf. *alaskaense*, *Athyrium filix-femina*.

Yatza Mountain - 710-735 m altitude; timberline and alpine vegetation. Bedding areas and deer trails underneath elfinwood.

Kunghit Island - 490 m altitude; open heath-meadow and krummholz scrub. Numerous deer trails, droppings, hoof prints in pond mud; heavy browsing; old bones of deer carcass. Peat hags (peat areas eroded down to bedrock) could be the result of browsing and the break-up of vegetation cover by deer.

Hutton Inlet - sea level estuary meadow. Numerous deer droppings; heavy browsing of Sitka spruce saplings; browsing and grazing of: blueberry, lady-fern, *Dryopteris expansa*, *Maianthemum dilatatum*; grazing of estuary grasses: *Puccinellia*, *Deschampsia*, *Hordeum*, *Festuca*. Many of the forest floor species are restricted to areas beyond the reach of the deer; on logs,

stumps, and root bases (*Vaccinium parvifolium*, *V. ovalifolium*, *Menziesia ferruginea*).

Anna Lake - 150-230 m altitude; lakeshore meadow and adjacent forest. Deer browsing of lodgepole pine saplings; grazing of lady-fern and deer-fern; forest floor very open from browsing and grazing; ground flora restricted to stumps, root-bases, etc. (*Rubus spectabilis*, *Menziesia ferruginea*, *Vaccinium ovalifolium*, *Thelypteris limbosperma*, *Polystichum munitum*, *Adiantum pedatum*).

Some limited generalizations may be made from these observations. The deer are having an impact on the higher-elevation flora through grazing and browsing. Additional potential deer damage occurs in the break-up and erosion of the vegetation of shallow peat areas (peat hags). Browsing is common on the blueberries/huckleberries (*Vaccinium alaskaense*, *V. ovalifolium*, *V. parvifolium*, *V. caespitosum*), salmonberry (*Rubus spectabilis*), false azalea (*Menziesia ferruginea*), and copperbush (*Cladothamnus pyroliflorus*). Browsing damage of the two rare prostrate shrubs, *Salix reticulata* ssp. *glabellcarpa* and *Cassiope lycopodioides*, were not seen. The habitats of both these species are vertical rock cliffs and rock blocks, which provide difficult access for the deer.

Grazing is common on the ferns and broad-leaved herbs. Especially affected are: lady-fern (*Athyrium filix-femina*), maidenhair-fern (*Adiantum pedatum*), deer-fern (*Blechnum spicant*), spiny oak-fern (*Dryopteris expansa*), mountain wood-fern (*Thelypteris limbosperma*), and sword-fern (*Polystichum munitum*). Other ferns that are likely to be susceptible to grazing are: beech-fern (*Thelypteris phegopteris*), mountain holly-fern (*Polystichum lonchitis*), and members of the Braun's holly-fern complex (all of which are rare on the Queen Charlotte Islands [*Polystichum braunii*, *P. andersonii*, and *P. setigerum*]). Grazing damage occurs on these forbs: deer-cabbage (*Fauria crista-galli*), Queen Charlotte's saxifrage (*Saxifraga punctata* ssp.

*carlottae*), and Sitka valerian (*Valeriana sitchensis*). The following forbs are likely to be susceptible to grazing: Schofield's avens (*Geum schofieldii*), Calder's lovage (*Ligusticum calderi*), Newcombe's groundsel (*Senecio newcombei*), Queen Charlotte's groundsel (*Senecio moresbiensis*), Caltha-leaf avens (*Geum calthifolium*), triangular-leaved groundsel (*Senecio triangularis*), mountain sorrel (*Oxyria digyna*), cow-parsnip (*Heracleum lanatum*), western white-lettuce (*Prenanthes alata*), mountain daisy (*Erigeron peregrinus*), broadleaf arnica (*Arnica latifolia*), and roseroot stonecrop (*Sedum roseum*).

A thorough review of the effect of deer populations on the Queen Charlotte's forest vegetation was published by Pojar *et al.* (1980). They describe "a virtual epidemic of deer," having "drastic effects on the vegetation." Forest shrub and herb layers had been dramatically reduced; seedling and sapling regeneration of redcedar and yellow-cedar had been depleted or eliminated and severely reduced for Sitka spruce and western hemlock. Destabilization of soil slopes resulted from removal of the root systems of the shrubs. The

report comments briefly on the implications for the rare plants of the Queen Charlotte Islands:

Some rare vascular plant species on the Charlottes will become even rarer. Others, including most of the uncommon species of the mountains, are not immediately threatened by deer because of their preference for rocky high-elevation steplands. However, given time and an increasingly desperate herbivore, some of these species could become restricted to the most inaccessible microhabitats.

Twelve years later, these implications have been confirmed. The excessive deer populations are the most serious threat to the endemic and rare flora of the Queen Charlotte Islands.

There is a vast amount of ecological information on the impact of high ungulate populations on the depletion and extirpation of floras, especially those of geographically confined island ecosystems. This information needs to be implemented now to reduce the deer populations, and to prevent catastrophic loss and damage to the rare and endemic flora.

---

## 4 DISCUSSION

### 4.1 Mt. Laysen

Ten endemic taxa and 8 rare taxa were recorded, out of a total of 75. The following notable taxa occur here:

*Geum schofieldii* – this is the rarest of the endemics; only four localities are known for the Queen Charlotte Islands (two are on Moresby Island), and a single occurrence on Brooks Peninsula, Vancouver Island. Very small populations occur in all localities. Only two individual plants were seen on Mt. Laysen.

*Salix reticulata* ssp. *glabellcarpa* – only four localities are known on the Queen Charlotte Islands (three are on Moresby Island.). Two large populations were found on Mt. Laysen, forming extensive vegetative mats on rock cliffs.

*Pedicularis lanata* – five localities are known for the Queen Charlotte Islands (three are on Moresby Island). Two small populations were seen on Mt. Laysen.

*Saxifraga punctata* ssp. *carlottae* – eight localities are known for the Queen Charlotte Islands (three of which are on

Moresby Island.). Two small populations were seen on Mt. Laysen.

*Castilleja parviflora* – although widely distributed in British Columbia, only four localities are known from the Queen Charlotte Islands, all from Moresby Island. A single small population was seen on Mt. Laysen.

*Saxifraga tolmiei* – widely occurring in coastal British Columbia, three localities are recorded for the Queen Charlotte Islands, of which two are on Moresby Island. A small population was seen on Mt. Laysen.

*Artemisia arctica* – this widespread arctic-alpine species is known only from two locations on the Queen Charlotte Islands, both on Moresby Is., and both consisting of very small populations. A single small population was found on Mt. Laysen. North American plants range from Alaska, Yukon and MacKenzie Districts, south to Colorado and California; they are tetraploid and have been treated as distinct from the diploid *A. norvegica* of Norway, Scotland, and the Russian Ural Mountains. Alternatively, the two have been treated as conspecific, with the North American plants as *A. norvegica* ssp. *saxatilis*.

*Polygonum viviparum* – another common and widespread circumpolar arctic-alpine species, it is known from only three localities on the Queen Charlotte Islands, two of which are on Moresby Is. A single small population was seen on Mt. Laysen.

*Saxifraga ferruginea* var. *diffusa* – botanists are divided on the taxonomic status of this plant. It has been treated as a distinct species (*Saxifraga newcombei*), as a variety of *S. ferruginea*, or dismissed as an environmental variant. The very large rosette of densely woolly leaves is strikingly different from the growth form of typical *S. ferruginea*.

These large plants grow on alpine outcrops or maritime headlands, two environments that induce dwarfism rather than gigantism, as in this plant. This suggests genetic rather than environmental variation, and that taxonomic recognition at the specific or infraspecific level would be most appropriate. However, Randhawa and Beamish (1970) reached a different conclusion from their analysis of numerous morphological characters on plants sampled throughout British Columbia, including four populations from the Queen Charlottes. Their analysis showed extreme variability in all characters, but they were unable to find any consistent correlated character differences on which to base infraspecific taxa. Further biosystematic studies on this plant are needed.

## 4.2 Yatza Mountain

This rounded summit is at too low an elevation to support a large alpine flora, the main vegetation being dwarfed elfinwood and krummholz with heath in the openings of the coniferous colonies. The small areas of rock cliffs, runnels, and outcrops are the habitats for 7 endemic and 6 rare taxa, out of a total of 45 taxa. Notable species are: *Lloydia serotina*, *Isopyrum savilei*, *Senecio moresbiensis*, and *Viola biflora* ssp. *carlottae*.

## 4.3 Barry Peak

Fifty-eight taxa were recorded here, of which six are endemics and eight rare taxa. Notable species are: *Castilleja parviflora*, *Lloydia serotina*, *Isopyrum savilei*, and *Viola biflora* ssp. *carlottae*.

## 4.4 Pocket Peak

This is one of the higher peaks, with good cliff, outcrop, and runnel habitats. Seventy-seven taxa were recorded, of which eight are endemics and eight are rare taxa. The following

notable species, *Penstemon davidsonii*, was found and is a new species record for the Queen Charlotte Islands. A common alpine species of the Coast Mountains, Vancouver Island Mountains, and the western Cascade Mountains, its typical habitats are mountain peaks, ridge crests, and outcrops. A single small population was found on Pocket Peak. Its nearest occurrences are on Vancouver Island, and in the Coast Mountains in the Prince Rupert area. Other notable species are:

- Castilleja parviflora* – one small population seen
- Oxyria digyna* – a single population seen
- Artemisia arctica* – a single small population seen
- Sedum roseum* ssp. *roseum* – a single population seen
- Saxifraga punctata* ssp. *carlottae* – two populations seen
- Loiseleuria procumbens* – scarce
- Lloydia serotina* – very scarce
- Senecio moresbiensis* – very scarce
- Isopyrum savilei* – occasional.

#### 4.5 De La Beche Ridge

This is a low, rounded ridge (645–705 m), dominated by krummholz scrub, heath, and peaty areas; the few endemic and rare taxa occur on rock blocks and outcrops. Fifty taxa were recorded, of which three are endemic and seven are rare taxa.

Notable species are: *Platanthera chorisiana* and *Loiseleuria procumbens*.

#### 4.6 Kunghit Island

This is a low-elevation (490 m) rounded ridge with vegetation of dwarf conifers, krummholz, heath, and peaty areas. A few scattered rock outcrops supported the few rare species. Of 55 taxa recorded, 3 are endemics and 4 are rare taxa. Notable species are:

- Saxifraga ferruginea* var. *diffusa* – a small population on rock outcrop

- Loiseleuria procumbens* – a small population in heath
- Selaginella wallacei* – a single population on rock outcrop

#### 4.7 Anna Lake Waterfall

Although at a low elevation (150–230 m), the high species richness and abundant endemic and rare taxa of this site are a consequence of the specialized habitats of the waterfall and the lake meadow, and of the apparently calcareous substrate. Seventy-nine taxa were recorded, of which five are endemics and eight are rare taxa. Notable taxa include: *Mimulus guttatus* ssp. *haidensis*, *Thelypteris limbosperma*, *Polystichum lonchitis*, *Arnica amplexicaulis*, *Platanthera chorisiana*, *Senecio moresbiensis*, and *Viola biflora* ssp. *carlottae*.

#### 4.8 Hutton Inlet Estuary

The intertidal and meadow area of this estuary was inventoried. Like all estuarine meadows there is extremely low species diversity (16 taxa total, 1 rare species), and all are specialized halophytes: *Cochlearia*, *Salicornia*, *Spergularia*, *Puccinellia*, *Glaux*, *Stellaria humifusa*, *Sagina crassicaulis*, *Plantago maritima*, and *Trifolium wormskioldii*.

#### 4.9 Cape St. James

During a brief stop-off at Cape St. James the introduced and native species around the lighthouse were listed. Two notable species here are: *Saxifraga feruginea* var. *diffusa* and *Mimulus* sp. (probably *Mimulus guttatus* ssp. *haidensis*).

#### 4.10 Species Occurrence Among Mountain Areas

Some of the endemic species are known to be widespread and common on the Queen Charlotte Islands (Calder and Taylor 1968). In the present study, *Ligusticum calderi* was

found in all seven of the mountain areas surveyed, *Senecio newcombei* and *Calamagrostis sesquiflora* were found in six of the seven mountain areas, and *Cassiope lycopodioides* was found in five of the surveyed mountains. Other species that are also widely distributed in the Queen Charlotte Ranges but

have smaller populations are: *Saxifraga taylori*, *Lloydia serotina*, *Senecio moresbiensis*, and *Viola biflora* ssp. *carlottae*; these were found in four to five of the seven mountain areas surveyed, but were sparse to very sparse in abundance.

## REFERENCES

- British Columbia Conservation Data Centre. 1993. Native vascular plant tracking lists. B.C. Ministry of Environment, Victoria, B.C.
- Calder, J.A. and R.L. Taylor. 1968. Flora of the Queen Charlotte Islands. Part 1: Systematics of the Vascular Plants. Canada Department of Agriculture, Research Branch, Monograph No. 4. Ottawa, Ont.
- Heusser, C.J. 1989. North Pacific coastal refugia—the Queen Charlotte Islands in perspective. *In* The Outer Shores. Based on the proceedings of the Queen Charlotte Islands First International Scientific Symposium, August 1994, University of British Columbia. G.G.E. Scudder and N. Gessler (editors). Queen Charlotte Islands Museum Press, Skidegate, B.C.
- Ogilvie, R.T. 1989. Disjunct vascular flora of northwestern Vancouver Island in relation to Queen Charlotte Islands' endemism and Pacific Coast refugia. *In* The Outer Shores. Based on the proceedings of the Queen Charlotte Islands First International Scientific Symposium, August 1994, University of British Columbia. G.G.E. Scudder and N. Gessler (editors). Queen Charlotte Islands Museum Press, Skidegate, B.C. pp. 127–130.
- . 1991. Rare and endangered alpine plants in British Columbia. *In* Community Action For Endangered Species. Proceedings of the Symposium on British Columbia's Threatened and Endangered Species and Their Habitat. S. Rautio (editor). Federation of B.C. Naturalists and Northwest Wildlife Preservation Society, Vancouver, B.C. pp. 131–142.
- . (In press). The vascular plants and phytogeography of Brooks Peninsula. *In* The Brooks Peninsula: A Glacial Refugium. R.J. Hebda (editor). Royal British Columbia Museum, Memoir. Victoria, B.C.
- Ogilvie, R.T. and A. Ceska. 1984. Alpine plants of phytogeographic interest on northwest Vancouver Island. *Can. J. Bot.* 62: 2356–2362.
- . 1988. Endemic and disjunct vascular flora of the North Pacific Coast. (Abstract). Canadian Botanical Association Meeting, Program and Abstracts. Victoria, B.C. (unpaginated).
- Ogilvie, R.T. and H.L. Roemer. 1984. The rare plants of the Queen Charlotte Islands. *B.C. Naturalist* 22 (2): 17–18.
- Pojar, J. 1980. Possible glacial refugium on the Brooks Peninsula, northwestern Vancouver Island. (Abstract). Botany 80 Conference, Bot. Soc. America, Misc. Series, Publ. 158, p. 89.
- Pojar, J., T. Lewis, H. Roemer, and D.J. Wilford. 1980. Relationships between introduced black-tailed deer and the plant life of the Queen Charlotte Islands, British Columbia. B.C. Ministry of Forests Report, Smithers, B.C.
- Randhawa, A.S. and K.I. Beamish. 1970. Observations on the morphology, anatomy, classification, and reproductive cycle of *Saxifraga ferruginea*. *Can. J. Bot.* 48: 299–312.

- Roemer, H.L. and R.T. Ogilvie. 1983. Additions to the flora of the Queen Charlotte Islands on limestone. *Can. J. Bot.* 61 (10): 2577-2580.
- Scudder, G.G.E. and N. Gessler (editors). 1989. *The Outer Shores*. Based on the proceedings of the Queen Charlotte Islands First International Scientific Symposium, August 1994, University of British Columbia. Queen Charlotte Islands Museum Press, Skidegate, B.C.
- Straley, G.B., R.L. Taylor, and G.W. Douglas. 1985. *The rare vascular plants of British Columbia*. National Museums of Canada, Syllogeus No. 59. Ottawa, Ont.
- Taylor, R.L. 1989. Vascular plants of the Queen Charlotte Islands. *In* *The Outer Shores*. Based on the proceedings of the Queen Charlotte Islands First International Scientific Symposium, August 1994, University of British Columbia. G.G.E. Scudder and N. Gessler (editors). Queen Charlotte Islands Museum Press, Skidegate, B.C. pp. 121-125.



---

Queen's Printer for British Columbia©  
Victoria, 1994